

<b>Taxon:</b> <i>Coix lacryma-jobi</i> L.	<b>Family:</b> Poaceae
<b>Common Name(s):</b> adlay adlay millet Job's tears kukaekolae puoheohe	<b>Synonym(s):</b> <i>Coix lacryma-jobi</i> <i>Coix lacryma</i> <i>Coix ovata</i> <i>Coix pendula</i> <i>Lithagrostis lacryma-jobi</i> <i>Sphaerium lacryma</i>

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Approved	<b>End Date:</b> 19 Aug 2023
<b>WRA Score:</b> 9.0	<b>Designation:</b> H(HPWRA)	<b>Rating:</b> High Risk

**Keywords:** Weedy Grass, Naturalized, Fodder. Self-Fertile, Water-Dispersed

Qsn #	Question	Answer Option	Answer
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	y
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	0 = low, 1 = intermediate, 2 = high (see Appendix 2)	High
202	Quality of climate match data	0 = low, 1 = intermediate, 2 = high (see Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y = 1, n = 0	n
204	Native or naturalized in regions with tropical or subtropical climates	y = 1, n = 0	y
205	Does the species have a history of repeated introductions outside its natural range?	y = -2, ? = -1, n = 0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n = question 205	y
302	Garden/amenity/disturbance weed	y = 1*multiplier (see Appendix 2), n = 0	y
303	Agricultural/forestry/horticultural weed		
304	Environmental weed		
305	Congeneric weed	y = 1*multiplier (see Appendix 2), n = 0	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	y = 1, n = -1	n
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		

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y = 1, n = 0	y
411	Climbing or smothering growth habit	y = 1, n = 0	n
412	Forms dense thickets	y = 1, n = 0	y
501	Aquatic	y = 5, n = 0	n
502	Grass	y = 1, n = 0	y
503	Nitrogen fixing woody plant	y = 1, n = 0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y = 1, n = 0	n
601	Evidence of substantial reproductive failure in native habitat	y = 1, n = 0	n
602	Produces viable seed	y = 1, n = -1	y
603	Hybridizes naturally	y = 1, n = -1	y
604	Self-compatible or apomictic	y = 1, n = -1	y
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	1
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		
704	Propagules adapted to wind dispersal	y = 1, n = -1	n
705	Propagules water dispersed	y = 1, n = -1	y
706	Propagules bird dispersed		
707	Propagules dispersed by other animals (externally)	y = 1, n = -1	n
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m <sup>2</sup> )	y = 1, n = -1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)		
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?	y
	Source(s)	Notes
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"It has been widely introduced elsewhere and has become naturalised throughout the tropics and subtropics about 22°N and S. It has been naturalized in Africa and the southern United States and the New World tropics. The cultivation of <i>Coix lacryma</i> var. <i>ma-yuen</i> began 3,000-4,000 years ago in India, 2,000 years ago in China. It was a very important crop before maize and rice became widespread staple crops. Secondary centres of diversity developed in the hilly region of S China, and, most recently, in Brazil."
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 17 Aug 2023]	"Job's tears is indigenous to southern and eastern Asia. It has been cultivated since ancient times, 3000-4000 years ago in India, 2000 years ago in China, and was very important before maize and rice became widespread staple foods. At present Job's tears is cultivated as a minor cereal crop throughout the tropics and subtropics, especially in Asia."

102	Has the species become naturalized where grown?	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.	"in Hawai'i naturalized and common along streams and ditches, but also found on slopes in disturbed mesic forest, 0-610 m, on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i. Hillebrand (1888) mentions <i>Coix</i> and implies its presence in Hawai'i prior to 1871, but the earliest collection seen was made on O'ahu in 1903 (Bryan s.n., BISH)."
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"It has been widely introduced elsewhere and has become naturalised throughout the tropics and subtropics about 22°N and S. It has been naturalized in Africa and the southern United States and the New World tropics."

103	Does the species have weedy races?	y
	Source(s)	Notes
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 14 Aug 2023]	" <i>Coix lacryma-jobi</i> is a grass indigenous to Southern and Eastern Asia that has been introduced in tropical and warm temperate regions as a cereal, fodder and forage crop, and for its attractive grains which are used as beads for making rosaries, necklaces, and other objects. It has escaped cultivation and become naturalized in more than 90 countries, often occurring as a weed in humid and disturbed sites, along waterways and forest edges, wetlands and swamps. <i>C. lacryma-jobi</i> is a robust grass that grows forming dense and tall clumps that block the flow of waterways and outcompete native vegetation. It is listed as invasive in Singapore, Australia, New Caledonia, the Cook Islands, the Galapagos, Greece Hawaii, French Polynesia, Mexico, Brazil, Nicaragua, Costa Rica, Puerto Rico, the Virgin Islands, Jamaica and on many islands in the Pacific and Indian Ocean. It is regarded as potentially invasive in the Mascarene Islands (Mauritius, Reunion and Rodrigues)."

Qsn #	Question	Answer
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
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"Adlay is native to tropical Asia from India to peninsular Malaysia. The greatest diversity is found in the Malay archipelago. It has been widely introduced elsewhere and has become naturalised throughout the tropics and subtropics about 22°N and S. It has been naturalized in Africa and the southern United States and the New World tropics."
202	Quality of climate match data	High
	Source(s)	Notes
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"Adlay is native to tropical Asia from India to peninsular Malaysia. The greatest diversity is found in the Malay archipelago. It has been widely introduced elsewhere and has become naturalised throughout the tropics and subtropics about 22°N and S. It has been naturalized in Africa and the southern United States and the New World tropics."
203	Broad climate suitability (environmental versatility)	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 and common along streams and ditches, but also found on slopes in disturbed mesic forest, 0-610 m"
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 16 Aug 2023]	"Job's tears occurs wild in swampy locations and along watercourses. It is a quantitative short-day plant and requires high temperatures, abundant rainfall and reasonably fertile soils. In the tropics it occurs from sea-level up to 2000 m altitude, in Africa often around villages and on abandoned fields."
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"[Broad elevation range in tropics, but requires adequate moisture] "In its native range, adlay is commonly found growing alongside streams, ditches, and water courses in grasslands, perennial crop fields, abandoned fields, along roadsides and on slopes in disturbed mesic forest, from 0 to 2,000 m altitude. The crop thrives in fertile soils with pH of 4.5-8.4, on poor soils the fruits are hollow. It is tolerant of flooding and water-logging but is intolerant of drought."
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"Adlay is native to tropical Asia from India to peninsular Malaysia. The greatest diversity is found in the Malay archipelago. It has been widely introduced elsewhere and has become naturalised throughout the tropics and subtropics about 22°N and S. It has been naturalized in Africa and the southern United States and the New World tropics."
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to Asia, naturalized throughout the tropics; in Hawai'i naturalized and common along streams and ditches, but also found on slopes in disturbed mesic forest, 0-610 m, on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i."
205	Does the species have a history of repeated introductions outside its natural range?	y

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"Adlay is native to tropical Asia from India to peninsular Malaysia. The greatest diversity is found in the Malay archipelago. It has been widely introduced elsewhere and has become naturalised throughout the tropics and subtropics about 22°N and S. It has been naturalized in Africa and the southern United States and the New World tropics."

301	Naturalized beyond native range	y
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"Adlay is native to tropical Asia from India to peninsular Malaysia. The greatest diversity is found in the Malay archipelago. It has been widely introduced elsewhere and has become naturalised throughout the tropics and subtropics about 22°N and S. It has been naturalized in Africa and the southern United States and the New World tropics."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to Asia, naturalized throughout the tropics; in Hawai'i naturalized and common along streams and ditches, but also found on slopes in disturbed mesic forest, 0-610 m, on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i."

302	Garden/amenity/disturbance weed	y
	<b>Source(s)</b>	<b>Notes</b>
	Haselwood, E.L., Motter, G.G., & Hirano, R.T. (eds.). (1983). Handbook of Hawaiian Weeds. University of Hawaii Press, Honolulu, HI	"Grows wild in damp waste lands. A weed in and along irrigation and drainage ditches."
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi L.</i> In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 19 Aug 2023]	"Plants escaped from cultivation occur as weeds."
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	[A potential environmental weed, but in the Hawaiian Islands, does not appear to be having significant impacts relative to other invasive weeds] "Coix lacryma-jobi can spread rapidly along waterways. It is capable of forming dense clumps and large colonies which may block the flow of watercourses and outcompete native plants including mesic and riparian vegetation and native aquatic plants (MacKee, 1994; Technigro, 2010; Weed Watch, 2010; I3N-Brasil, 2017; PIER, 2017)."

Qsn #	Question	Answer
303	<b>Agricultural/forestry/horticultural weed</b>	
	<b>Source(s)</b>	<b>Notes</b>
	NSW WeedWise. (2023). Job's tears ( <i>Coix lacryma-jobi</i> ). <a href="https://weeds.dpi.nsw.gov.au/Weeds/JobsTears">https://weeds.dpi.nsw.gov.au/Weeds/JobsTears</a> . [Accessed 19 Aug 2023]	"Job's tears forms dense infestations that: compete with native plants in and on the edges of waterways alter water flows restrict access to water for people and livestock can compete with crops such as sugar cane or rice limit recreational activities such as boating."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Bananas, Orchards and Plantations, Pastures"
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	[Values in some locations as a food crop but may also compete with desirable vegetation] " <i>Coix lacryma-jobi</i> has been cultivated for food, forage and medicinal purposes for thousands of years. It appears to have been an important crop in Southern and Eastern Asia before rice and maize became widespread (Jansen, 2006). At present, it is rather an accessory crop, but there is a growing demand due to its nutritional and medicinal qualities (Diao, 2017)."
304	<b>Environmental weed</b>	
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	[Potential environmental weed. Impacts in the Hawaiian Islands appear to be minor in the natural environment] " <i>Coix lacryma-jobi</i> can spread rapidly along waterways. It is capable of forming dense clumps and large colonies which may block the flow of watercourses and outcompete native plants including mesic and riparian vegetation and native aquatic plants (MacKee, 1994; Technigro, 2010; Weed Watch, 2010; I3N-Brasil, 2017; PIER, 2017)."
305	<b>Congeneric weed</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
401	<b>Produces spines, thorns or burrs</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Robust annuals; culms 100-300 cm tall, many-branched. Sheaths loose, terete, striate, glabrous; ligule membranous, 1.5-2 mm long, margins erose and minutely fringed; blades 10-50 cm long, 20-50 cm wide, glabrous but rather coarse. Inflorescences numerous, terminal and axillary, each consisting of separate pistillate and staminate racemes, cupules borne on long stout peduncles from axis of upper leaves, white or bluish, bony, lustrous, globose-ovoid, 5-15 mm long; upper pistillate floret fertile, lemma scale-like, 3-5-nerved; palea reduced to a small scale; staminodia 3; staminate raceme 3-5 cm long, the spikelets 7-10 mm long, glumes equal to the spikelet in length, coriaceous-membranous, broadly lanceolate, glabrous, smooth, lemma membranous, lanceolate, 3-nerved, glabrous, palea similar in shape and texture to lemma, 2-nerved. Caryopsis broadly ellipsoid to subglobose, 2.5-5 mm long."
402	<b>Allelopathic</b>	

Qsn #	Question	Answer
	Source(s)	Notes
	Li, J., & Jin, Z. (2010). Potential allelopathic effects of <i>Mikania micrantha</i> on the seed germination and seedling growth of <i>Coix lacryma-jobi</i> . <i>Weed Biology and Management</i> , 10(3), 194-201	[Unknown, but in this study, <i>Coix lacryma-jobi</i> was studied as the target of, rather than the cause, of allelopathic effects] "The allelopathic potential of <i>Mikania micrantha</i> H.B.K. to affect the seed germination and seedling growth of <i>Coix lacryma-jobi</i> L. was investigated. Water-soluble allelopathic substances were found in the water extracts of <i>M. micrantha</i> . The effect of the water extracts on the seed germination and seedling growth of <i>C. lacryma-jobi</i> was concentration-dependent. The water extracts from the different plant parts (leaf, stem, and root) of <i>M. micrantha</i> differed in their effect on the germination and seedling growth of <i>C. lacryma-jobi</i> , with the effect of the leaf extract being the least inhibitory. The malondialdehyde (MDA) content in the <i>C. lacryma-jobi</i> seedlings increased by 64%, 45%, and 52% of the control with increasing concentrations of the extracts of the root, stem, and leaf (80, 400, and 400 g L <sup>-1</sup> , respectively). The extract from the <i>M. micrantha</i> roots significantly increased the catalase (CAT) activity of the <i>C. lacryma-jobi</i> seedlings (48% and 54% of the control at the concentrations of 20 g L <sup>-1</sup> and 80 g L <sup>-1</sup> , respectively). The extracts from the leaves and stems at low concentrations increased the CAT activity, but at high concentrations, the extracts decreased the CAT activity. The extracts from the roots, stems, and leaves at concentrations of 80, 400, and 400 g L <sup>-1</sup> also significantly decreased the peroxidase (POD) activity of the <i>C. lacryma-jobi</i> seedlings to 27%, 52%, and 34% of the control, respectively. These results indicate that the water extracts of <i>M. micrantha</i> could inhibit the seed germination and seedling growth of <i>C. lacryma-jobi</i> through the regulation of anti-oxidase activity, such as POD and CAT in the cells. The growth inhibition of the <i>C. lacryma-jobi</i> seedlings is probably related to injury after oxidization of the cell membranes with the increase of MDA content."

403	Parasitic	n
	Source(s)	Notes
	Lim, T.K. 2013. <i>Edible Medicinal And Non-Medicinal Plants</i> . Volume 5, Fruits. Springer, Dordrecht	] "Robust, erect, perennial, strongly tillering grass" [Poaceae]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). <i>Forage Crops of the World, Volume I: Major Forage Crops</i> . Apple Academic Press Inc., Oakville, ON	"It may be grown as a fodder plant in marshy areas which cannot be easily drained and which retain but insufficient water for transplanted paddy crops. The foliage of young plants is used as fodder. In latter state, cattle generally do not prefer owing to its course in nature. However, it is said to be used as a fodder crop in absence of other green forage during this time. The herbage contains 8.5% crude protein and 28.0% crude fiber. It is mixed with molasses and concentrates to make it more palatable. On breaking the outer shell, a cowry-shaped grain is obtained. The grains can be used after grinding as poultry feed. It can also be used as silage. It can be used in the preparation of any article of food that is usually made of rice and with the same degree of palatability. Perched grains are made into beverage in Japan. A light beer, "Dzu" is made from it by the "Nagas." The fruits after hulling can be fed to poultry (Anonymous, 1988)."
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). <i>PROTA (Plant Resources of Tropical Africa)</i> , Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 16 Aug 2023]	"the new fresh leaves are an excellent fodder. Normal yield of husked grain varies from 2-4 t/ha. The hulling percentage is 30-50%. If cultivated for fodder, several cuts per year are possible. "

Qsn #	Question	Answer
405	Toxic to animals	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). <i>Coix lacryma-jobi</i> . <a href="https://tropical.theferns.info/viewtropical.php?id=Coix+lacryma-jobi">https://tropical.theferns.info/viewtropical.php?id=Coix+lacryma-jobi</a> . [Accessed 19 Aug 2023]	"Known Hazards None known"
	Hedayetullah, M., & Zaman, P. (Eds.). (2019). Forage Crops of the World, Volume I: Major Forage Crops. Apple Academic Press Inc., Oakville, ON	[No evidence] "It may be grown as a fodder plant in marshy areas which cannot be easily drained and which retain but insufficient water for transplanted paddy crops. The foliage of young plants is used as fodder. In latter state, cattle generally do not prefer owing to its course in nature. However, it is said to be used as a fodder crop in absence of other green forage during this time. The herbage contains 8.5% crude protein and 28.0% crude fiber. It is mixed with molasses and concentrates to make it more palatable."
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 19 Aug 2023]	[No evidence] "The whole grain and the bran are fed to poultry and the flour can replace maize flour in poultry feed. Job's tears is often given as a fodder, especially for cattle and horses. It is suitable for silage, and straw and leaves are used for thatching."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 19 Aug 2023]	"The most serious disease of Job's tears is smut ( <i>Ustilago coicis</i> ) which destroys the ovaries. Smut can severely damage crops and therefore seed treatment with fungicide or with hot water (60-70°C) for at least 10 minutes before sowing is recommended. Another important disease of Job's tears is leaf blight ( <i>Bipolaris coicis</i> ); control measures include burning of crop residues, spraying of fungicides and the use of more resistant cultivars. Tar leaf spot ( <i>Phyllachora coicis</i> ), rust ( <i>Puccinia operata</i> ) and <i>Ustilago lachrymae-jobi</i> (synonym: <i>Sporisorium lachrymae-jobi</i> ) are some of the other diseases attacking Job's tears."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). <i>Coix lacryma-jobi</i> . <a href="https://tropical.theferns.info/viewtropical.php?id=Coix+lacryma-jobi">https://tropical.theferns.info/viewtropical.php?id=Coix+lacryma-jobi</a> . [Accessed 19 Aug 2023]	"Known Hazards None known"



Qsn #	Question	Answer
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 19 Aug 2023]	[Multiple human uses. No mention of risks or toxicity] "Types of Job's tears with soft-shelled false fruits can be easily husked and have large grains which are eaten in the same way as rice, alone or mixed with it. They can be substituted for rice in all foodstuffs. The grain can also be roasted before husking and then used in porridge, cakes, soups and other foods or in the preparation of sweets. Dough made from the flour will not rise because of the absence of gluten. A good mixture for bakery purposes is 70% wheat flour and 30% Job's tears flour. The raw grain tastes sweet and is often eaten as a snack. In Africa Job's tears is considered a famine food. Both alcoholic and non-alcoholic drinks are prepared from it. A beer made from the pounded grain is popular among Indian hill tribes and in the Philippines. The whole grain and the bran are fed to poultry and the flour can replace maize flour in poultry feed. Job's tears is often given as a fodder, especially for cattle and horses. It is suitable for silage, and straw and leaves are used for thatching. The grain and flour of Job's tears are easily digestible and given to people in weak condition. They are believed to have medicinal value with diuretic, depurative, anti-inflammatory and antitumour activity. A decoction of the leaves is drunk against headache, rheumatism and diabetes. Sap of the stem is applied against insect bites. A decoction of the roots is used as a vermifuge and to treat dysentery, gonorrhoea and menstrual disorders. Almost everywhere where Job's tears grows, the decorative, hard-shelled false fruits of the wild types are used as beads for necklaces, rosaries, rattles, curtains etc., and in Africa they are often worn at ritual and religious occasions. The whole inflorescence is sometimes used in dried flower arrangements."

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed ]	[Unknown. Occurs in relatively wet, and presumably low fire risk habitats. As a grass, flammability may increase during periods of extended drought] "Job's tears occurs wild in swampy locations and along watercourses. It is a quantitative short-day plant and requires high temperatures, abundant rainfall and reasonably fertile soils. In the tropics it occurs from sea-level up to 2000 m altitude, in Africa often around villages and on abandoned fields. "

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Plants for a Future. (2023). <i>Coix lacryma-jobi</i> . <a href="https://pfaf.org">https://pfaf.org</a> . [Accessed 17 Aug 2023]	"It cannot grow in the shade. It prefers moist soil."
	NC State Extension. (2023). <i>Coix lacryma-jobi</i> . <a href="https://plants.ces.ncsu.edu/plants/coix-lacryma-jobi/">https://plants.ces.ncsu.edu/plants/coix-lacryma-jobi/</a> . [Accessed 17 Aug 2023]	"Light: Full sun (6 or more hours of direct sunlight a day) Partial Shade (Direct sunlight only part of the day, 2-6 hours)"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Hedayatullah, M., & Zaman, P. (Eds.). (2019). Forage Crops of the World, Volume I: Major Forage Crops. Apple Academic Press Inc., Oakville, ON	"It can be grown on all types of soil, preferably clay to clay loam soil. It can also be grown in marshy-swampy soils. It can be tolerant to salinity. Some species can grow in warm slopes of hills up to 1600-1700 m above sea level."

411	Climbing or smothering growth habit	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Robust annuals; culms 100-300 cm tall, many-branched."
412	<b>Forms dense thickets</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabdigitalibrary.org/product/qi">https://www.cabdigitalibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	"C. lacryma-jobi is a robust grass that grows forming dense and tall clumps that block the flow of waterways and outcompete native vegetation. It is listed as invasive in Singapore, Australia, New Caledonia, the Cook Islands, the Galapagos, Greece Hawaii, French Polynesia, Mexico, Brazil, Nicaragua, Costa Rica, Puerto Rico, the Virgin Islands, Jamaica and on many islands in the Pacific and Indian Ocean. It is regarded as potentially invasive in the Mascarene Islands (Mauritius, Reunion and Rodrigues)."
501	<b>Aquatic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	[Terrestrial] "In its native range, adlay is commonly found growing alongside streams, ditches, and water courses in grasslands, perennial crop fi elds, abandoned fi elds, along roadsides and on slopes in disturbed mesic forest, from 0 to 2,000 m altitude."
502	<b>Grass</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 16 Aug 2023]	"Family: Poaceae (alt. Gramineae) Subfamily: Panicoideae Tribe: Andropogoneae Subtribe: Rottboelliinae"
503	<b>Nitrogen fixing woody plant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 16 Aug 2023]	"Family: Poaceae (alt. Gramineae) Subfamily: Panicoideae Tribe: Andropogoneae Subtribe: Rottboelliinae"
504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Robust annuals; culms 100-300 cm tall, many-branched."
601	<b>Evidence of substantial reproductive failure in native habitat</b>	<b>n</b>

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"Adlay is native to tropical Asia from India to peninsular Malaysia. The greatest diversity is found in the Malay archipelago. It has been widely introduced elsewhere and has become naturalised throughout the tropics and subtropics about 22°N and S. It has been naturalized in Africa and the southern United States and the New World tropics."

602	Produces viable seed	y
	<b>Source(s)</b>	<b>Notes</b>
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 16 Aug 2023]	"Job's tears is usually propagated by seed. The 1000-seed weight is 80-90 g. Seed is dibbled, 5 cm deep, at the start of the rains, after ploughing or hoeing the field. Row spacing is 40-80 cm, and seed rate 7-15 kg/ha. When cultivated as an intercrop, it is sown at random or plants are grown along field borders. Propagation by cuttings is possible and recommended for fodder production. Propagation by seed gives deeper rooting, and, consequently, better drought tolerance and higher grain yield."
	Haselwood, E.L., Motter, G.G., & Hirano, R.T. (eds.). (1983). Handbook of Hawaiian Weeds. University of Hawaii Press, Honolulu, HI	"Propagation: By seed."

603	Hybridizes naturally	y
	<b>Source(s)</b>	<b>Notes</b>
	Rao, P. N., & Nirmala, A. (1993). Interspecific chromosome homologies in <i>Coix lacryma-jobi</i> L. and <i>C. gigantea</i> Koen. (Maydeae). <i>Cytologia</i> , 58(4), 355-360	"There are at least two wild species, <i>C. aquatica</i> Roxb. ( $2n = 10$ ) and <i>C. gigantea</i> Koen. ( $2n = 20, 40$ ), that occur in south and southeast Asia. Only recently interspecific hybrids and genome homologies between Job's tears and <i>C. aquatica</i> are dealt with separately, and the study currently made on the other combination ( <i>C. lacryma-jobi</i> $2n=20$ , and its colchicine induced tetraploid $4n=40 \times C. gigantea$ $2n=20$ ) with reference to chromosome pairing in hybrids and assessment of intergenomic chromosome homologies is presented here." ... "Cytological check of a very vigorous plant among Clj ( $2n$ ) individuals showed PM Cs with $2n = 19$ and 20 chromosomes even within the same anther with frequent occurrence of associations of 3 and 4 chromosomes. This was suspected to be a natural hybrid between Clj ( $2n$ ) and Cg with the former as female parent. Artificial crosses between Clj ( $n$ JO) and Cg ( $n= 10$ ) with the former as female parent gave 14 seeds of which 4 germinated and 3 turned out to be hybrids giving the same cytological behaviour mentioned above, and the 4th was a diploid C/j plant apparently developed due to parthenogenesis."

604	Self-compatible or apomictic	y
	<b>Source(s)</b>	<b>Notes</b>
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 17 Aug 2023]	"Both self-pollination and cross-pollination are possible, with the latter usually being predominant."

605	Requires specialist pollinators	n
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 17 Aug 2023]	"Like most grasses, the flowers of <i>C. lacryma-jobi</i> are pollinated by the wind."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	"It can also propagate by cuttings (which is the preferred method for fodder production) and by rhizome fragmentation (Schaaffhausen, 1952)."
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 17 Aug 2023]	"Job's tears is usually propagated by seed. The 1000-seed weight is 80-90 g. Seed is dibbled, 5 cm deep, at the start of the rains, after ploughing or hoeing the field. Row spacing is 40-80 cm, and seed rate 7-15 kg/ha. When cultivated as an intercrop, it is sown at random or plants are grown along field borders. Propagation by cuttings is possible and recommended for fodder production. Propagation by seed gives deeper rooting, and, consequently, better drought tolerance and higher grain yield."
	NSW WeedWise. (2023). Job's tears ( <i>Coix lacryma-jobi</i> ). <a href="https://weeds.dpi.nsw.gov.au/Weeds/JobTears">https://weeds.dpi.nsw.gov.au/Weeds/JobTears</a> . [Accessed 19 Aug 2023]	"New plants can grow from rhizomes. These can be broken off in floods and spread downstream."

607	Minimum generative time (years)	1
	Source(s)	Notes
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 16 Aug 2023]	"Job's tears is normally harvested 4-6 months after sowing, depending on the cultivar and the season. Usually, whole plants are cut at the base when the grain is ripe."
	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.	"Robust annuals; culms 100-300 cm tall, many-branched."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	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.	"Caryopsis broadly ellipsoid to subglobose, 2.5-5 mm long." [No means of external attachment]
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	"The floating bead-like involucre containing the fruit are carried by water, particularly during floods. They are also likely dispersed by birds and mammals (Weed Watch, 2010)."

Qsn #	Question	Answer
702	Propagules dispersed intentionally by people	y
	<b>Source(s)</b>	<b>Notes</b>
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 17 Aug 2023]	"At present Job's tears is cultivated as a minor cereal crop throughout the tropics and subtropics, especially in Asia. Plants escaped from cultivation occur as weeds. In Africa Job's tears is naturalized in most countries but only very occasionally cultivated (e.g. in Liberia)."
703	Propagules likely to disperse as a produce contaminant	
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Contaminant, Crop, Herbal, Ornamental, Pasture" [Potential contaminant of other crops]
704	Propagules adapted to wind dispersal	n
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Caryopsis broadly ellipsoid to subglobose, 2.5-5 mm long." [No adaptations for wind dispersal]
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabdigitallibrary.org/product/qi">https://www.cabdigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	"The floating bead-like involucre containing the fruit are carried by water, particularly during floods. They are also likely dispersed by birds and mammals (Weed Watch, 2010)."
705	Propagules water dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawai'i naturalized and common along streams and ditches"
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabdigitallibrary.org/product/qi">https://www.cabdigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	"The floating bead-like involucre containing the fruit are carried by water, particularly during floods. They are also likely dispersed by birds and mammals (Weed Watch, 2010)."
706	Propagules bird dispersed	
	<b>Source(s)</b>	<b>Notes</b>
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 19 Aug 2023]	"Rats, birds and sometimes grasshoppers and termites may cause considerable losses." [Birds and rodents may act as seed predators rather than dispersers, although some dispersal of viable seeds could potentially occur]
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabdigitallibrary.org/product/qi">https://www.cabdigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	"The floating bead-like involucre containing the fruit are carried by water, particularly during floods. They are also likely dispersed by birds and mammals" [Possibly, although did not find direct evidence]
707	Propagules dispersed by other animals (externally)	n

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	NSW WeedWise. (2023). Job's tears ( <i>Coix lacryma-jobi</i> ). <a href="https://weeds.dpi.nsw.gov.au/Weeds/JobsTears">https://weeds.dpi.nsw.gov.au/Weeds/JobsTears</a> . [Accessed 19 Aug 2023]	"Job's tears produces up to 100 seeds per plant per year. Plants can mature and start producing viable seed after only 4 months. The seeds float and are mainly spread downstream by water."
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 19 Aug 2023]	"Rats, birds and sometimes grasshoppers and termites may cause considerable losses." [Seed predators might occasionally carry and dispersal viable seeds, but this is not likely to be an important dispersal vector.]

708	Propagules survive passage through the gut	
	<b>Source(s)</b>	<b>Notes</b>
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 19 Aug 2023]	"Rats, birds and sometimes grasshoppers and termites may cause considerable losses." [Seed predators might consume and disperse viable seeds.]

801	Prolific seed production (>1000/m <sup>2</sup> )	n
	<b>Source(s)</b>	<b>Notes</b>
	NSW WeedWise. (2023). Job's tears ( <i>Coix lacryma-jobi</i> ). <a href="https://weeds.dpi.nsw.gov.au/Weeds/JobsTears">https://weeds.dpi.nsw.gov.au/Weeds/JobsTears</a> . [Accessed 19 Aug 2023]	"Job's tears produces up to 100 seeds per plant per year. Plants can mature and start producing viable seed after only 4 months. "

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	<b>Source(s)</b>	<b>Notes</b>
	Jansen, P.C.M. (2006). <i>Coix lacryma-jobi</i> L. In: Brink, M. & Belay, G. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. <a href="https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)">https://uses.plantnet-project.org/en/Coix_lacryma-jobi_(PROTA)</a> . [Accessed 19 Aug 2023]	"Job's tears takes about 1-2 weeks to germinate, depending on the moisture content of the soil."

803	Well controlled by herbicides	y
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	<p>NSW WeedWise. (2023). Job's tears (<i>Coix lacryma-jobi</i>). <a href="https://weeds.dpi.nsw.gov.au/Weeds/JobsTears">https://weeds.dpi.nsw.gov.au/Weeds/JobsTears</a>. [Accessed 19 Aug 2023]</p>	<p>"Chemical Spraying Spray actively growing plants and ensure that all the foliage is covered with the herbicide. As most infestations are near the water, ensure that the appropriate herbicides are used and avoid run off or spray drift into the waterways. If plants are fruiting, remove all the fruit before spraying if possible. Dispose of the fruit. Splatter gun Splatter guns can be used for dense infestations of weeds that are difficult to reach. The specialised nozzle produces large droplets that allow plants up to 10 m away to be sprayed with limited chance of spray drift. Spray small amounts of concentrated herbicide onto the weeds. It is not necessary to cover all of the foliage. Herbicide options WARNING - ALWAYS READ THE LABEL Users of agricultural or veterinary chemical products must always read the label and any permit, before using the product, and strictly comply with the directions on the label and the conditions of any permit. Users are not absolved from compliance with the directions on the label or the conditions of the permit by reason of any statement made or not made in this information. To view permits or product labels go to the Australian Pesticides and Veterinary Medicines Authority website <a href="http://www.apvma.gov.au">www.apvma.gov.au</a> See Using herbicides for more information. PERMIT 9907 Expires 31/03/2025 Glyphosate 360 g/L (Various products) Rate: 1 part herbicide per 9 parts water Comments: Splatter gun application. See permit for conditions. Withholding period: Nil. Herbicide group: 9 (previously group M), Inhibition of 5-enolpyruvyl shikimate-3 phosphate synthase (EPSP inhibition) Resistance risk: Moderate PERMIT 9907 Expires 31/03/2025 Glyphosate 360 g/L with Metsulfuron-methyl 600 g/kg (Various products) Rate: Tank mixes of up to 2 L glyphosate + 15 g metsulfuron methyl per 100 L water. Comments: Spot spraying application. See permit for conditions. Withholding period: Nil. Herbicide group: 9 (previously group M), Inhibition of 5-enolpyruvyl shikimate-3 phosphate synthase (EPSP inhibition) Resistance risk: Moderate PERMIT 9907 Expires 31/03/2025 Glyphosate 360 g/L (Various products) Rate: Rate of up to 1:50 herbicide to water. Comments: Spot spray. See permit for conditions. Withholding period: Nil. Herbicide group: 9 (previously group M), Inhibition of 5-enolpyruvyl shikimate-3 phosphate synthase (EPSP inhibition) Resistance risk: Moderate"</p>
	<p>CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a>. [Accessed 19 Aug 2023]</p>	<p>"Drizzle foliar application of glyphosate provided complete control (100% injury) in experimental trials in Hawaii (Motooka, 1999), however, because this species often grows in areas near watercourses, the use of herbicides is not recommended."</p>

Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 19 Aug 2023]	"If identified early, young plants may be removed manually, although care should be taken to remove all of the root system."
	NSW WeedWise. (2023). Job's tears ( <i>Coix lacryma-jobi</i> ). <a href="https://weeds.dpi.nsw.gov.au/Weeds/JobTears">https://weeds.dpi.nsw.gov.au/Weeds/JobTears</a> . [Accessed 19 Aug 2023]	[Resprouts from rhizomes] "Hand removal - Dig up small immature plants if the infestation is small. Remove all of the roots and remove the plants from the site because the rhizomes can regrow."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	<b>Source(s)</b>	<b>Notes</b>
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. (1999). Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Possibly no. Widely distributed] "in Hawai'i naturalized and common along streams and ditches, but also found on slopes in disturbed mesic forest, 0-610 m, on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i."



**Summary of Risk Traits:**

*Coix lacryma-jobi* (Job's tears) is a robust, perennial grass native to tropical Asia from India to peninsular Malaysia. It has been widely introduced elsewhere and has become naturalized throughout the tropics and subtropics about 22°N and S, including the Hawaiian Islands of Kauai, Oahu, Molokai, Maui, and Hawaii. Although valued as an ornamental and food plant in some locations, it can form dense stands in riparian areas, and may compete with and suppress native plants and other desirable vegetation.

**High Risk / Undesirable Traits**

- Thrives and spreads in regions with tropical climates
- Naturalized on Kauai, Oahu, Molokai, Maui, and Hawaii (Hawaiian Islands) and widely naturalized in the wet tropics
- A weed of riparian areas that may negatively impacts certain native vegetation and agricultural crops
- Tolerates many soil types (not substrate limited)
- Reproduces by seeds and vegetatively by rhizome fragments.
- Hybridizes with other *Coix* species.
- Self-fertile
- Capable of reaching maturity in <1 year.
- Seeds and rhizome fragments dispersed by water, and through intentional cultivation.
- Seeds may also be dispersed by birds, and possibly other animals.
- Tolerates and resprouts after grazing and cutting.

**Low Risk Traits**

- An agricultural crop with an ancient, domesticated variety that may be less invasive than the wild type.
- Unarmed (no spines, thorns, or burrs)
- Palatable and used as a fodder plant.
- Non-toxic
- Grows well in high light environments (dense shade may inhibit spread)
- Herbicides may provide effective control if needed.