

Taxon: Oxalis stricta L.	Family: Oxalidaceae
Common Name(s): upright yellow sorrel yellow sheep sorrel yellow wood sorrel	Synonym(s): Oxalis europaea Jord.

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 29 Mar 2019
WRA Score: 16.5	Designation: H(HPWRA)	Rating: High Risk

Keywords: Annual Herb, Horticulture Weed, Self-Compatible, Contaminant, Ballistic Dispersal

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)	Low
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	n
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)	y
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
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	y
406	Host for recognized pests and pathogens	y=1, n=0	y
407	Causes allergies or is otherwise toxic to humans		
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	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets		
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	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	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
704	Propagules adapted to wind dispersal		
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m ²)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Flora of North America. (2019). <i>Oxalis stricta</i> . http://www.efloras.org . [Accessed 28 Mar 2019]	[No evidence] "Flowering (Apr–)Jul–Oct. Prairie ravines, riverbanks, sandbars, low woods, mesic forests, floodplains, roadsides, fields, lawns, gardens; 20–1200 m; B.C., Man., N.B., Nfld. and Labr. (Nfld.), N.S., Ont., P.E.I., Que., Sask.; Ala., Ariz., Ark., Colo., Conn., Del., D.C., Ga., Idaho, Ill., Ind., Iowa, Kans., Ky., La., Maine, Md., Mass., Mich., Minn., Miss., Mo., Mont., Nebr., N.H., N.J., N.Mex., N.Y., N.C., N.Dak., Ohio, Okla., Pa., R.I., S.C., S.Dak., Tenn., Vt., Va., Wash., W.Va., Wis., Wyo.; introduced in Europe, Asia, Africa, Pacific Islands (New Zealand), Australia. <i>Oxalis stricta</i> is uncommon and probably adventive in Canada and the western United States. The species is recognized by the combination of its tall (rarely up to nearly a meter), erect stems from a short, simple rhizome; septate hairs; cymose inflorescence; and small flowers. Septate hairs on the stems and petioles are easily recognized (lens) by their colored cross walls, but they vary greatly in density. In villicaulis forms, the hairs are dense and evenly distributed, but in most plants over the range they are localized around the nodes and intermixed with nonseptate hairs. Often they are sparse; rarely they appear to be absent on plants with greatly reduced vestiture overall."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2019). 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"	Low
	Source(s)	Notes

Qsn #	Question	Answer
	<p>USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 27 Mar 2019]</p>	<p>"Native Asia-Temperate CHINA: China [Guangxi, Hebei, Hubei, Jiangxi, Jilin, Shanxi, Zhejiang, Henan, Liaoning] EASTERN ASIA: Japan, [Hokkaidô, Honshu] Korea Europe EASTERN EUROPE: Belarus Northern America EASTERN CANADA: Canada [New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Québec] WESTERN CANADA: Canada [Manitoba, Saskatchewan] NORTHEASTERN U.S.A.: United States [Indiana, Maine, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, Connecticut] NORTH-CENTRAL U.S.A.: United States [Iowa, Kansas, Minnesota, Missouri, North Dakota, South Dakota, Illinois, Oklahoma] SOUTHEASTERN U.S.A.: United States [Alabama, Arkansas, Delaware, Georgia, Kentucky, Maryland, North Carolina, South Carolina, Virginia, Mississippi, Tennessee]"</p>

202	Quality of climate match data	High
	Source(s)	Notes
	<p>USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed]</p>	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	<p>Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709</p>	<p>"Climatic requirements - None of the four taxa studied here are found north of the 57th parallel. This may represent climatic restrictions, or it may reflect distribution restricted by the dispersal powers of the species." ... "It therefore seems likely that the present distributions of <i>O. stricta</i> and <i>O. dillenii</i> ssp. <i>dillenii</i> do not represent the boundaries of their climatic requirements."</p>
	<p>Flora of North America. (2019). <i>Oxalis stricta</i>. http://www.efloras.org. [Accessed]</p>	<p>[Broad distribution and elevation range] "Flowering (Apr–)Jul–Oct. Prairie ravines, riverbanks, sandbars, low woods, mesic forests, floodplains, roadsides, fields, lawns, gardens; 20–1200 m; B.C., Man., N.B., Nfld. and Labr. (Nfld.), N.S., Ont., P.E.I., Que., Sask.; Ala., Ariz., Ark., Colo., Conn., Del., D.C., Ga., Idaho, Ill., Ind., Iowa, Kans., Ky., La., Maine, Md., Mass., Mich., Minn., Miss., Mo., Mont., Nebr., N.H., N.J., N.Mex., N.Y., N.C., N.Dak., Ohio, Okla., Pa., R.I., S.C., S.Dak., Tenn., Vt., Va., Wash., W.Va., Wis., Wyo.; introduced in Europe, Asia, Africa, Pacific Islands (New Zealand), Australia."</p>

204	Native or naturalized in regions with tropical or subtropical climates	n

Qsn #	Question	Answer
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 28 Mar 2019]	"Naturalized Africa Africa Asia-Temperate RUSSIAN FAR EAST: Russian Federation [Primorye] Europe EASTERN EUROPE: Ukraine Europe"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Flora of North America. (2019). <i>Oxalis stricta</i> . http://www.efloras.org . [Accessed 28 Mar 2019]	"introduced in Europe, Asia, Africa, Pacific Islands (New Zealand), Australia."

301	Naturalized beyond native range	y
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 28 Mar 2019]	"Naturalized Africa Africa Asia-Temperate RUSSIAN FAR EAST: Russian Federation [Primorye] Europe EASTERN EUROPE: Ukraine Europe"
	Bishop Museum.(2019). Online Natural Sciences Collections. http://nsdb.bishopmuseum.org/ . [Accessed 28 Mar 2019]	No collections in the Hawaiian Islands to date
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. (2019). Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed]	No evidence to date. Only <i>Oxalis corniculata</i> and <i>Oxalis debilis</i> are reported to be naturalized in the Hawaiian Islands

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Lollar, M. & Marble, C. (2018). Biology and Management of <i>Oxalis</i> (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 29 Mar 2019]	" <i>Oxalis</i> can be found growing in sidewalk cracks, alongside trails, in lawns, flower beds, cultivated fields, and in container nursery stock in a wide range of elevations (Halvorson and Guertin, 2003). In greenhouse studies, oxalis populations have been shown to negatively impact the growth rates of ornamental crops (Neal and Derr 2005)."

303	Agricultural/forestry/horticultural weed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Lollar, M. & Marble, C. (2018). Biology and Management of Oxalis (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed]	"Oxalis can be found growing in sidewalk cracks, alongside trails, in lawns, flower beds, cultivated fields, and in container nursery stock in a wide range of elevations (Halvorson and Guertin, 2003). In greenhouse studies, oxalis populations have been shown to negatively impact the growth rates of ornamental crops (Neal and Derr 2005)."
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dilleni</i> Jacq. ssp. <i>dilleni</i> and <i>O. dilleni</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	" <i>Oxalis stricta</i> and <i>O. dilleni</i> spp. <i>dilleni</i> often occur on cultivated land. The extent of the loss from invasion of cropland by <i>Oxalis</i> is not known."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Cereals, Cotton, Cutflowers, Grapevines, Nursery Production, Orchards & Plantations, Pastures, Vegetables"

304	Environmental weed	n
	Source(s)	Notes
	T.E.R:R.A.I.N. (2019). <i>Oxalis stricta</i> (Yellow woodsorrel). http://www.terrain.net.nz/ . [Accessed 29 Mar 2019]	"Commonly it is considered a weed of gardens, fields, and lawns."
	Lollar, M. & Marble, C. (2018). Biology and Management of Oxalis (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 29 Mar 2019]	"Oxalis can be found growing in sidewalk cracks, alongside trails, in lawns, flower beds, cultivated fields, and in container nursery stock in a wide range of elevations (Halvorson and Guertin, 2003). In greenhouse studies, oxalis populations have been shown to negatively impact the growth rates of ornamental crops (Neal and Derr 2005)."
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dilleni</i> Jacq. ssp. <i>dilleni</i> and <i>O. dilleni</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	" <i>Oxalis stricta</i> and <i>O. dilleni</i> spp. <i>dilleni</i> often occur on cultivated land. The extent of the loss from invasion of cropland by <i>Oxalis</i> is not known."
	WRA Specialist. (2019). Personal Communication	Potentially, but primarily regarded as a weed of nurseries, crops and gardens

305	Congeneric weed	y
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dilleni</i> Jacq. ssp. <i>dilleni</i> and <i>O. dilleni</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	" <i>Oxalis corniculata</i> and <i>O. dilleni</i> ssp. <i>filipes</i> are specially harmful in the greenhouse as weeds (Whitcomb and Santelmann 1977)."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Flora of North America. (2019). <i>Oxalis stricta</i> . http://www.efloras.org . [Accessed 28 Mar 2019]	[No evidence] "Herbs annual or short-lived perennial, caulescent, rhizomes present, <short>, stolons absent, bulbs absent. Aerial stems 1(–3) from base, erect or later leaning or falling over and decumbent, <not rooting at nodes>, 20–60(–90) cm, herbaceous, villous, <hairs ± straight, spreading, usually nonseptate and septate, septate hairs commonly concentrated at nodes, very rarely only nonseptate>. Leaves basal and cauline; stipules rudimentary; petiole 2–8 cm, <hairs septate and nonseptate>; leaflets 3, light green to yellowish green, obcordate, (8–)10–2 (–30) mm, lobed 1/5–1/3 length, surfaces glabrous, oxalate deposits absent."

402	Allelopathic	
	Source(s)	Notes
	Hódi, A. M., Hódi, L., & Palkovics, L. (2012). Comparative study of the allelopathic effects of invasive wood sorrels (<i>Oxalis corniculata</i> L., <i>Oxalis dillenii</i> jacq.) in Hungary. In Proceedings of the International Symposium on Current Trends in Plant Protection, Belgrade, Serbia, 25-28th September, 2012. Pp. 86-88. Institute for Plant Protection and Environment	[Unknown. Allelopathy documented in other species] "Abstract : <i>Oxalis corniculata</i> and <i>Oxalis dillenii</i> are specially harmful weeds in greenhouses. Invasive spread of <i>Oxalis corniculata</i> and <i>Oxalis dillenii</i> could be observed in the latest decades mainly in urban surroundings in Hungary. The high oxalic acid content of these weed species has been known since long time, while, at the same time the effect of the extracts of the plants on other species has been rarely investigated. In this study the allelopathic effect of creeping wood sorrel and common yellow wood sorrel were assessed through laboratory analysis. The results reveal that extracts of shoots and roots of <i>Oxalis corniculata</i> influence the germination of test plants, while this effect is less evident for <i>Oxalis dillenii</i> . Both ethyl alcohol, and water extracts decreased the lengths of shoots of some of the test plants. The allelopathic effect of <i>O. corniculata</i> was more intense, which could explain its enhanced invasive spreading in Hungary. "

403	Parasitic	n
	Source(s)	Notes
	Flora of North America. (2019). <i>Oxalis stricta</i> . http://www.efloras.org . [Accessed 28 Mar 2019]	"Herbs annual or short-lived perennial, caulescent, rhizomes present"

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Anderson, R., Corbett, E., Anderson, M., Corbett, G., & Kelley, T. (2001). High White-Tailed Deer Density Has Negative Impact on Tallgrass Prairie Forbs. <i>The Journal of the Torrey Botanical Society</i> , 128(4), 381-392	"Table 2. Deer browsing on selected, proportional use, and low use species in 1992 for species with a relative abundance >2.0 in at least one sample." [<i>Oxalis stricta</i> browsed up to 62.5%]
	Quinton, D. A., Horejsi, R. G., & Flinders, J. T. (1979). Influence of brush control on white-tailed deer diets in north-central Texas. <i>Journal of Range Management</i> , 32(2), 93-97	"Table 2. Percent relative dry weight of food items in the diet of white-tailed deer in the Rolling Plains of north-central Texas." [<i>Oxalis stricta</i> consumed by deer in the fall]

405	Toxic to animals	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Burrows, G. E., & Tyrl, R. J. (2013). Toxic Plants of North America. Second Edition. Wiley-Blackwell, Hoboken, NJ	"Disease Problems—Species of <i>Oxalis</i> are typically rather innocuous and cause little problem in North America. In only rare instances of very large populations is there a risk of intoxication. The disease these species produce occurs worldwide in ruminants, mainly sheep. It may be acute, subacute, or chronic and occur after several days or months of grazing (Bull 1929; Smith 1951; McIntosh 1972; Rekhis and Amara 1990)."
	Lady Bird Johnson Wildflower Center. (2019). <i>Oxalis stricta</i> . https://www.wildflower.org/plants/result.php?id_plant=OXST . [Accessed 29 Mar 2019]	"Warning: POISONOUS PARTS: All parts. Low toxicity if ingested (no documented cases in humans). Symptoms in grazing animals, when eaten in large quantities, may cause trembling, cramps, and staggering as in grazing animals. Toxic Principle: Soluble oxalate."

406	Host for recognized pests and pathogens	y
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	" <i>Oxalis corniculata</i> , <i>O. dillenii</i> spp. <i>dillenii</i> and <i>O. stricta</i> serve as aerial hosts to the maize rusts <i>Puccinia sorghi</i> Schw. and <i>P. polysora</i> Underw.; sorghum rust <i>P. purpurea</i> Che.; and <i>Andropogon</i> rust, <i>P. andropogonis</i> Schw. As a result, their presence amongst such crops could provide a reservoir of infection."

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	"Beneficial -The leaves of all four taxa contain oxalic acid, and can be dried and added to many dishes to impart a "sharp" flavor. Caution is necessary, since <i>O. corniculata</i> may accumulate lethal concentrations of soluble oxalates. Many floras mention medicinal use of <i>Oxalis</i> leaves, taken both externally and internally, to treat a number of ailments, and Venkitaraman et al. (1972) have demonstrated antibacterial action by extracts of <i>Oxalis corniculata</i> . <i>Oxalis corniculata</i> and <i>O. stricta</i> are also cultivated as ornamentals and sometimes sold as "shamrock" (Kummert 1978)."
	Lady Bird Johnson Wildflower Center. (2019). <i>Oxalis stricta</i> . https://www.wildflower.org/plants/result.php?id_plant=OXST . [Accessed 29 Mar 2019]	"Warning: POISONOUS PARTS: All parts. Low toxicity if ingested (no documented cases in humans). Symptoms in grazing animals, when eaten in large quantities, may cause trembling, cramps, and staggering as in grazing animals. Toxic Principle: Soluble oxalate."

Qsn #	Question	Answer
	Burrows, G. E., & Tyrl, R. J. (2013). Toxic Plants of North America. Second Edition. Wiley-Blackwell, Hoboken, NJ	[Possible if consumed in abundance] "Species of <i>Oxalis</i> are notorious as oxalate accumulators — hence the genus name. The levels of oxalate in <i>O. pes-caprae</i> are reported in ranges of 3.7–14.9% soluble and 5.9–16.6% total, and in <i>O. corniculata</i> 4.1% soluble and 7% total (Libert and Franceschi 1987). In the plants, the sap pH is low, and the oxalate occurs as the free acid in the vacuoles and also as the acid/potassium salt (Michael 1959; Ranson 1965; Oke 1969). In this respect, <i>Oxalis</i> is similar to <i>Rumex</i> in the Polygonaceae (see Chapter 59). Blood calcium concentrations are not invariably decreased precipitously, although renal lesions of oxalate crystalluria are typical (Figure 52.3). Disease is a rarity with these plants in spite of the frequency with which they are encountered (Dodson 1959). As with other oxalate-accumulating plants, the rarity of intoxication is likely due in large measure to the activities of the ruminal microflora, which imparts tolerance when animals are gradually introduced to the plants rather than when they are suddenly required to subsist on them. Oxalate toxicity is much more likely to be caused by members of the Chenopodiaceae and Polygonaceae."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	"Perennial herb, (3-) 5- 40 (-78) cm tall" ... "Most specimens of <i>O. stricta</i> come from cultivated fields, roadside verges, lawns and woodland edges." [No evidence among impacts. Unlikely to contribute significantly to fuel load or fire risk given habit and habitat]

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	T.E.R.:R.A.I.N. (2019). <i>Oxalis stricta</i> (Yellow woodsorrel). http://www.terrain.net.nz/ . [Accessed 29 Mar 2019]	"Commonly it is considered a weed of gardens, fields, and lawns. It grows in full sun or shade."
	Lady Bird Johnson Wildflower Center. (2019). <i>Oxalis stricta</i> . https://www.wildflower.org/plants/result.php?id_plant=OXST . [Accessed 29 Mar 2019]	"Light Requirement: Sun"
	Belsinger, S. & Tucker, A. O. (2016). The Culinary Herbal: Growing and Preserving 97 Flavorful Herbs. Timber Press, Portland, OR	" <i>Oxalis stricta</i> is a partial-shade to shade-loving plant that prefers somewhat moist soil."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	" <i>O. stricta</i> is found in a wide range of soil types, but flourishes in loams with friable crumb structure."

Qsn #	Question	Answer
	Lollar, M. & Marble, C. (2018). Biology and Management of Oxalis (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 29 Mar 2019]	"Oxalis prefers moist soil but can grow in dry areas and in a variety of different soil types (Halvorson and Guertin 2003)."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	" <i>Oxalis stricta</i> - Perennial herb, (3-) 5- 40 (-78) cm tall; stems green to purplish, with septate and non-septate hairs appressed upwards, usually erect and unbranched, or with several branches from the base, occasionally decumbent later, arising singly from white to pink, succulent, underground perennial rhizomes"

412	Forms dense thickets	n
	Source(s)	Notes
	Lollar, M. & Marble, C. (2018). Biology and Management of Oxalis (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 29 Mar 2019]	[Impacts nursery plants. Unknown if dense cover can impact vegetation under natural settings or in outdoor crops] "Often forms dense mats from rhizomes (horizontal underground stems that form lateral shoots and adventitious roots)" ... "Oxalis can be found growing in sidewalk cracks, alongside trails, in lawns, flower beds, cultivated fields, and in container nursery stock in a wide range of elevations (Halvorson and Guertin, 2003). In greenhouse studies, oxalis populations have been shown to negatively impact the growth rates of ornamental crops (Neal and Derr 2005)."

501	Aquatic	n
	Source(s)	Notes
	Flora of North America. (2019). <i>Oxalis stricta</i> . http://www.efloras.org . [Accessed 28 Mar 2019]	[Terrestrial] "Herbs annual or short-lived perennial... Prairie ravines, riverbanks, sandbars, low woods, mesic forests, floodplains, roadsides, fields, lawns, gardens; 20–1200 m"

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 27 Mar 2019]	Family: Oxalidaceae

Qsn #	Question	Answer
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 27 Mar 2019]	Family: Oxalidaceae

Qsn #	Question	Answer
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Flora of North America. (2019). <i>Oxalis stricta</i> . http://www.efloras.org . [Accessed 28 Mar 2019]	"Herbs annual or short-lived perennial, caulescent, rhizomes present, <short>, stolons absent, bulbs absent."
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	"Perennial herb, (3-) 5- 40 (-78) cm tall; stems green to purplish, with septate and non-septate hairs appressed upwards, usually erect and unbranched, or with several branches from the base, occasionally decumbent later, arising singly from white to pink, succulent, underground perennial rhizomes, taproot lacking"

Qsn #	Question	Answer
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 28 Mar 2019]	[No evidence. Wide distribution] "Native Asia-Temperate CHINA: China [Guangxi, Hebei, Hubei, Jiangxi, Jilin, Shanxi, Zhejiang, Henan, Liaoning] EASTERN ASIA: Japan, [Hokkaidô, Honshu] Korea Europe EASTERN EUROPE: Belarus Northern America EASTERN CANADA: Canada [Québec, Nova Scotia, Ontario, Prince Edward Island, New Brunswick] WESTERN CANADA: Canada [Saskatchewan, Manitoba] NORTHEASTERN U.S.A.: United States [Connecticut, Indiana, Maine, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia] NORTH-CENTRAL U.S.A.: United States [Illinois, Iowa, Kansas, Minnesota, Missouri, North Dakota, Oklahoma, South Dakota] SOUTHEASTERN U.S.A.: United States [Alabama, Arkansas, Delaware, Georgia, Kentucky, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia]"

Qsn #	Question	Answer
602	Produces viable seed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	"seed capsules (5-) 8-13 (-18) mm long, glabrous or with septate hairs, 5-10 or more seeds per locule" ... "Seed production and dispersal -As described by Robertson (1975), dehiscence of seed capsules in all four taxa is through loculicidal slits on the abaxial sides of the carpels, out of which a turgid aril everts and then ruptures suddenly, ejecting the seeds. These seeds can be violently scattered up to 2 m from the parent plant."

603	Hybridizes naturally	y
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	" <i>Oxalis corniculata</i> , <i>O. stricta</i> , <i>O. dillenii</i> ssp. <i>dillenii</i> and <i>O. dillenii</i> ssp. <i>filipes</i> all formed capsules and set seed when mated with any of the other three taxa, but the number of seeds formed depends on the particular pairing of species, and also depends on which plant acts as the maternal or paternal parent (Lovett Doust et al. 1981). The number of flowers successfully forming fruits, and the number of seeds set per pod were not good predictors of the number of seeds capable of germination. <i>Oxalis dillenii</i> ssp. <i>filipes</i> is a facultative apomict, i.e. it can set seed both sexually and apomictically. Hybrid and apomictically set seedlings were distinguished by Lovett Doust et al. (1981) on the basis of their appearance."

604	Self-compatible or apomictic	y
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	"Despite the morphological "remains" of a tristylous breeding system (see Ornduff (1972), for a full account), all four taxa are facultative self-pollinators." ... "All four taxa possess the remains of a morphologically tristylous breeding system (see Darwin (1877)). There is no longer any biochemical self-incompatibility."
	Ushimaru, A. et al. (2004). The influence of floral symmetry and pollination systems on flower size variation. Nordic Journal of Botany, 24(5), 593-598	"naturalized <i>Oxalis stricta</i> is autogamous and rarely visited by insects in Japan, Ushimaru per. obs."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2004. The Families and genera of vascular plants. Volume VI. Flowering plants, Dicotyledons: Celastrales, Oxalidales, Rosales, Cornales, Ericales. Springer-Verlag, Berlin, Heidelberg, New York	"Flowers are short-lived and open only for a few hours on sunny days."
	Ushimaru, A. et al. (2004). The influence of floral symmetry and pollination systems on flower size variation. Nordic Journal of Botany, 24(5), 593-598	"naturalized <i>Oxalis stricta</i> is autogamous and rarely visited by insects in Japan, Ushimaru per. obs."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes

Qsn #	Question	Answer
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	" <i>Oxalis stricta</i> perennates and clones by means of buds on its fleshy underground stems (rhizomes)."
	Lollar, M. & Marble, C. (2018). Biology and Management of <i>Oxalis</i> (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed]	"Vegetative reproduction is prevalent in established populations from axillary buds at nodes located on rhizomes (Halvorson and Guertin 2003)."

607	Minimum generative time (years)	1
	Source(s)	Notes
	Flora of North America. (2019). <i>Oxalis stricta</i> . http://www.efloras.org . [Accessed 29 Mar 2019]	"Herbs annual or short-lived perennial, caulescent, rhizomes present, <short>, stolons absent, bulbs absent."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans, Animals, Horse, Livestock, Vehicles, Escapee"
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	"[Distribution and small seed size suggests seeds can be dispersed along heavily trafficked corridors] "seed capsules (5-) 8-13 (-18) mm long, glabrous or with septate hairs, 5-10 or more seeds per locule; seeds brown, very rarely with light lines on the transverse ridges." ... "Most specimens of <i>O. stricta</i> come from cultivated fields, roadside verges, lawns and woodland edges." ... "dehiscence of seed capsules in all four taxa is through loculicidal slits on the abaxial sides of the carpels, out of which a turgid aril everts and then ruptures suddenly, ejecting the seeds. These seeds can be violently scattered up to 2 m from the parent plant."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	eCRATER. (2019). <i>Oxalis Corniculata</i> Seeds 400pcs. https://www.ecrater.com . [Accessed 29 Mar 2019]	<i>Oxalis stricta</i> seeds sold at this and a number of other commercial websites

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes

Qsn #	Question	Answer
	Cross, G. B., & Skroch, W. A. (1992). Quantification of weed seed contamination and weed development in container nurseries. <i>Journal of Environmental Horticulture</i> , 10(3), 159-161	"An investigation was conducted at seven North Carolina nurseries to evaluate the possibility that container substrates serve as weed infestation sources. Container substrate treatments consisted of sand/pasteurized bark, bark/pasteurized sand, pasteurized bark/pasteurized sand, and bark/sand. No differences were observed between numbers of weed seedlings found in the four substrate combinations. Differences were observed across nursery sites and the nursery by date interactions. Five weed species most frequently observed were yellow woodsorrel (<i>Oxalis stricta</i> L.), hairy bittercress (<i>Cardamine hirsuta</i> L.), common groundsel (<i>Senecio vulgaris</i> L.), spotted spurge (<i>Euphorbia maculata</i> L.), and mouseear chickweed (<i>Cerastium vulgatum</i> L.)."
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Contaminant, Crop, Herbal, Ornamental"

704	Propagules adapted to wind dispersal	
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. <i>Canadian Journal of Plant Science</i> , 65(3), 691-709	"dehiscence of seed capsules in all four taxa is through loculicidal slits on the abaxial sides of the carpels, out of which a turgid aril everts and then ruptures suddenly, ejecting the seeds. These seeds can be violently scattered up to 2 m from the parent plant." [Wind, and small seed size, may facilitate some dispersal after dehiscence, but not specifically adapted for wind dispersal]

705	Propagules water dispersed	
	Source(s)	Notes
	Flora of North America. (2019). <i>Oxalis stricta</i> . http://www.efloras.org . [Accessed 29 Mar 2019]	[Distribution suggests seeds are probably moved by water after explosive dispersal from capsules] "Prairie ravines, riverbanks, sandbars, low woods, mesic forests, floodplains, roadsides, fields, lawns, gardens"

706	Propagules bird dispersed	n
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. <i>Canadian Journal of Plant Science</i> , 65(3), 691-709	"dehiscence of seed capsules in all four taxa is through loculicidal slits on the abaxial sides of the carpels, out of which a turgid aril everts and then ruptures suddenly, ejecting the seeds. These seeds can be violently scattered up to 2 m from the parent plant."

707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. <i>Canadian Journal of Plant Science</i> , 65(3), 691-709	"dehiscence of seed capsules in all four taxa is through loculicidal slits on the abaxial sides of the carpels, out of which a turgid aril everts and then ruptures suddenly, ejecting the seeds. These seeds can be violently scattered up to 2 m from the parent plant." [Small size may allow seeds to stick to animals in soil, or in fur, but seeds otherwise lack means of external attachment]

Qsn #	Question	Answer
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans, Animals, Horse, Livestock, Vehicles, Escapee"

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Bartuszevige, A. M., & Endress, B. A. (2008). Do ungulates facilitate native and exotic plant spread?: Seed dispersal by cattle, elk and deer in northeastern Oregon. <i>Journal of Arid Environments</i> , 72(6), 904-913	"Appendix. Complete list of species and the number of seeds identified in cattle, elk, and deer feces from two study areas in northeastern Oregon during 2005" [<i>Oxalis stricta</i> recorded in cattle]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans, Animals, Horse, Livestock, Vehicles, Escapee"

801	Prolific seed production (>1000/m2)	y
	Source(s)	Notes
	Lollar, M. & Marble, C. (2018). Biology and Management of <i>Oxalis</i> (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 29 Mar 2019]	"Persistence in ornamental production and landscapes is due to its prolific seed production; a single plant may produce up to 5,000 seeds in a year. At maturity, seeds are dispersed from explosively dehiscent capsules up to 16 feet away from the parent plant and germinate quickly (Halvorson and Guertin 2003; Neal and Derr 2005)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Seed Longevity: Long Term"
	Royal Botanic Gardens Kew. (2019) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 29 Mar 2019]	"Storage Conditions: The species has been shown to form a long-term persistent soil seed bank, with seeds surviving in the soil for at least five years in >10 % of published investigations (see Thompson et al., 1997). Unfortunately maximum longevity of the seeds in the soil was not stated in the available data. As such, although it is probable that the taxon exhibits orthodox storage behaviour, the exact criteria defined for this storage type (that seeds survive beyond 10 years in ambient conditions) cannot be met on the basis of the available data. A conservative classification of OP has subsequently been assigned."

803	Well controlled by herbicides	y
	Source(s)	Notes

Qsn #	Question	Answer
	Doust, L. L., MacKinnon, A., & Doust, J. L. (1985). Biology of Canadian weeds: 71. <i>Oxalis stricta</i> L., <i>O. corniculata</i> L., <i>O. dillenii</i> Jacq. ssp. <i>dillenii</i> and <i>O. dillenii</i> Jacq. ssp. <i>filipes</i> (Small) Eiten. Canadian Journal of Plant Science, 65(3), 691-709	"Danielson (1971) describes <i>O. stricta</i> as "one of our most severe problems" in nursery stock, and recommends mechanical removal as the only effective means of control. Correll (1979) suggests two preplant applications of glyphosphate and the use of pre-emergence herbicides to control weeds (including <i>O. stricta</i>) in field-grown nursery stock, with an additional treatment, for container-grown stock, of simazine (1.12 kg/ha) plus one of the following: oxadiazon (2.24 kg/ha), oryzalin (2.24 kg/ha), dephenamid (2.24 kg/ha), trifluralin (no dosage given), DCPA (11.21 kg/ha), alachlor (4.48 kg/ha) or napropamide (4.48 kg/ha). Craeger (1979) found that oxadiazon (2% G at 112-896 kg/ha), oxadiazon (5% G at 44.8-358.4 kg/ha) and oryzalin (75% WP at 4.5-9.0 kg/ha) gave good control of <i>O. corniculata</i> , <i>O. dillenii</i> ssp. <i>dillenii</i> , and <i>O. stricta</i> with little damage to container-grown stock; napropamide (10% G at 22.4-179.2 kg/ha) and alachlor (15% G at 11.2- 98. 7 kg/ha) were not effective."
	Lollar, M. & Marble, C. (2018). Biology and Management of Oxalis (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed 29 Mar 2019]	"Oxalis is controlled with most preemergent herbicides labeled for nursery and landscape use. Preemergence herbicides will not work if stolons, rhizomes, or root and stem fragments are left behind after hand weeding." ... "There are many different postemergence herbicides that are effective for oxalis control but most have to be applied as a directed application. Effective active ingredients include glyphosate (RoundUp®), glufosinate (Finale®), diquat (Reward®), and pelargonic acid (Scythe®), among several others. Both systemic and contact herbicides will provide effective control, but thorough coverage is needed for contact herbicides such as diquat or pelargonic acid. Postemergence herbicides are most effective when the weeds are small and actively growing. Always consult the manufacturer's label and follow all precautions when applying herbicides."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Lollar, M. & Marble, C. (2018). Biology and Management of Oxalis (<i>Oxalis stricta</i>) in Ornamental Crop Production. ENH1253 (Revised). University of Florida IFAS Extension, Gainesville, FL. https://edis.ifas.ufl.edu . [Accessed]	"Oxalis is generally tolerant of mowing and can develop a more prostrate growth habit in areas that are repeatedly mowed (Halvorson and Guertin 2003). Rototilling mature oxalis can promote the initiation of new plants by spreading cut rhizomes and stems (Halvorson and Guertin 2003)."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad climate suitability, and elevation range exceeds 1000 m, demonstrating environmental versatility
- Naturalized outside native range, but not reported in the Hawaiian Islands to date
- A weed of lawns, gardens, greenhouses and crops
- Other *Oxalis* species are invasive
- Contains oxalate that can be toxic to animals if consumed in large quantities
- Host of crop pests and pathogens
- Shade tolerant
- Tolerates many soil types
- Reproduces by seeds and vegetatively by rhizomes
- Hybridizes with other *Oxalis* species
- Autogamous and self-compatible
- Reaches maturity rapidly (<1 year)
- Seeds dispersed ballistically, as a contaminant, internally by animals, and likely through external attachment to machines, equipment and animals
- Prolific seed production
- Forms a persistent seed bank
- Tolerates mowing

Low Risk Traits

- A temperate climate weed; would likely only impact tropical island ecosystems at higher elevations
- Unarmed (no spines, thorns, or burrs)
- Browsed by deer and other animals (palatable despite potential toxicity)
- Herbicides may provide effective control