Taxon: Senecio vulgaris L. **Family:** Asteraceae

Common Name(s): common fireweed
common groundsel
groundsel

Synonym(s): Erigeron senecio Sch.Bip. ex Webb &
Senecio vulgari-humilis Batt. & Trab.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 29 Feb 2016

WRA Score: 14.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Annual, Crop Weed, Toxic, Self-Compatible, Wind-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	Intermediate
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	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	n

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	n
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	n
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	y
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m2)	y=1, n=-1	y
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	n
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**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	No evidence of domestication

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

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2016. 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"**	**Intermediate**
	Source(s)	**Notes**

Qsn #	Question	Answer
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Feb 2016]	[Primarily a temperate weed, but marginally tropical] "Other: . exact native range obscure Native: Africa Macaronesia: Spain - Canary Islands Northern Africa: Algeria; Egypt; Libya; Morocco; Tunisia Asia-Temperate Caucasus: Armenia; Azerbaijan; Georgia; Russian Federation-Ciscaucasia - Ciscaucasia China: China - Guizhou, - Jilin, - Liaoning, - Nei Monggol, - Sichuan, - Xizang, - Yunnan Eastern Asia: Korea Russian Far East: Russian Federation - Kurile Islands, - Khabarovsk, - Primorye, - Kamchatka, - Sakhalin Siberia: Russian Federation - Altay, - Buryatia, - Irkutsk, - Kemerovo, - Krasnoyarsk, - Kurgan, - Novosibirsk, - Omsk, - Tomsk, - Tuva, - Tyumen, - Yakutia-Sakha Western Asia: Afghanistan; Egypt - Sinai; Iran; Iraq; Israel; Lebanon; Syria; Turkey Asia-Tropical Indian Subcontinent: India - Assam, - Jammu and Kashmir, - Tamil Nadu Europe East Europe: Belarus; Estonia; Latvia; Lithuania; Moldova; Russian Federation-European part - European part; Ukraine Middle Europe: Austria; Belgium; Czech Republic; Germany; Hungary; Netherlands; Slovakia; Switzerland Northern Europe: Denmark; Faroe Islands; Finland; Iceland; Ireland; Norway; Sweden; United Kingdom Southeastern Europe: Albania; Bosnia and Herzegovina; Bulgaria; Croatia; Greece; Italy; Macedonia; Montenegro; Romania; Serbia; Slovenia Southwestern Europe: France; Portugal; Spain"

202	Quality of climate match data	High
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Feb 2016]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	**Notes**
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"A very diverse group of crop species is invaded by S. vulgaris in different geographical areas in tropical, sub-tropical and cool weather regions. The weed appears to be of high geographical and climatic tolerance since seed germination occurs at a range of temperatures between 7 and 25°C."

Qsn #	Question	Answer
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"S. vulgaris is a ubiquitous weed found in the temperate zones of Europe, North and South America, Africa and Asia (Senesac 1991). Cooler temperatures at high elevations will slow its rate of development (McHenry et al. 1990). In warmer climates such as California, however, it is a winter annual that appears soon after fall irrigation (McHenry et al. 1990). Its optimal growing temperature was estimated to be 22°C from meristem tips grown in static tube culture (Walkey and Cooper 1976)."
	Plants for a Future. 2016. Senecio vulgaris. http://www.pfaf.org/user/Plant.aspx?LatinName=Senecio+vulgaris. [Accessed 29 Feb 2016]	"USDA hardiness zone : 5-9"

204	Native or naturalized in regions with tropical or subtropical climates	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.	"Native to Eurasia, now widely distributed in temperate regions; in Hawai'i naturalized on Haleakala, Maui, and Parker Ranch and Ahumoa, Hawai'i, perhaps more widespread. First collected on Hawai'i in 1938 (Ewart III 178, BISH)."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"S. vulgaris has become naturalized in Canada, and specimens have been collected in all provinces and the Northwest and Yukon Territories, but not Nunavut, though it is most commonly found in southern Ontario and Quebec (Fig. 2). Its North American range extends as far north as 64°N and 68°N in the Yukon Territory and Alaska, respectively (Hultén 1968), and as far south as Mexico (Gleason 1952). It has also been introduced into South Africa, South America, Hawaii, New Zealand, Australia and Hong Kong (Hultén 1968)."

301	Naturalized beyond native range	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.	"Native to Eurasia, now widely distributed in temperate regions; in Hawai'i naturalized on Haleakala, Maui, and Parker Ranch and Ahumoa, Hawai'i, perhaps more widespread. First collected on Hawai'i in 1938 (Ewart III 178, BISH)."
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"S. vulgaris has become naturalized in Canada, and specimens have been collected in all provinces and the Northwest and Yukon Territories, but not Nunavut, though it is most commonly found in southern Ontario and Quebec (Fig. 2). Its North American range extends as far north as 64°N and 68°N in the Yukon Territory and Alaska, respectively (Hultén 1968), and as far south as Mexico (Gleason 1952). It has also been introduced into South Africa, South America, Hawaii, New Zealand, Australia and Hong Kong (Hultén 1968)."

Qsn #	Question	Answer
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"S. vulgaris is usually regarded as a temperate weed and although it has a worldwide distribution it appears to be more localized in many European countries (Chater and Walters, 1976) and North America. The weed is especially prolific and plentiful on fertile soil, completely smothering crops at early stages. However, its spread in tropical regions is very limited, with only a restricted number of countries in Africa and South America affected. It is also quite well represented in Asian and Mediterranean countries."

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	"Although common groundsel grows best in moist fertile soil, it can grow in more trying environments such as along roadsides and other disturbed sites. It is also one of the major weeds in nurseries. It is a competitive plant in landscaped areas and gardens, but it is generally not a problem in lawns." ... "Because common groundsel produces so many seeds and the seeds are easily spread, it can rapidly produce an unsightly infestation in landscape beds. In flower and vegetable gardens, early-emerging common groundsel plants can out-compete later emerging crop seedlings and reduce their growth. Common groundsel plants that emerge after the crop is established are not effective competitors and have less of an impact."
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"This species grows as a weed in a wide range of habitats, including gardens, lawns, flower beds and waste places, arable land, and roadsides."

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

Qsn #	Question	Answer
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"S. vulgaris is of widespread significance in over 49 countries, infesting most cultivated crops in different parts of the world. It has been reported to be a serious weed of maize in Canada, of woody plant nurseries in England, Norway and Sweden; and of horticultutal crops (vegetables and small fruits) in the Netherlands, Norway and Sweden; and of strawberries in Scotland. With regard to competitiveness, S. vulgaris is one of the most dominant weeds in maize where prevention of yield losses requires a weed-free period of 274-135 growing degree days, although this was associated with a yield loss of 8.3 and 12.7% (Ferrero et al., 1996). In carrots, and in the presence of other weed species, the critical period of weed competition occurs 60 days after emergence. The weed strongly competes with apple trees, lowers N concentration in leaves, causes a deficit in soil moisture, reduces root activity and decreases yield and quality (Atkinson and Crisp, 1983). S. vulgaris has a low demand for K and Mg and higher requirements for Ca and P (Qasem and Hill, 1993a, 1995a). However, during severe root restriction, the weed showed a higher tissue concentration of P and Mg and lower Ca (Qasem and Hill, 1995b). It showed a higher specific absorption rate of N, P, K, Ca and Mg than tomato (Qasem and Hill, 1993b), while its competition index with Chenopodium album increased according to its proportion in the mixture (Qasem and Hill, 1994). Growth of this species was greatly reduced with ammonia and urea forms of nitrogen, and both affected the weed root concentration of P (Qasem and Hill, 1993c). Although no specific study is available on the losses caused by this weed in different crops, it was found to reduce yields of broccoli by 18 and 30% at densities of 3 or 8 plants/m², respectively (Agamalian, 1983). Many studies have reported this species as a noxious weed prevalent in most crops and causing yield losses in association with other weeds, yet it frequently escapes chemical control. In addition to the losses caused through direct competition, certain studies reported an allelopathic activity of S. vulgaris on certain species."

304	Environmental weed	n
	Source(s)	**Notes**
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"S. vulgaris is of widespread significance in over 49 countries, infesting most cultivated crops in different parts of the world."
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"This species grows as a weed in a wide range of habitats, including gardens, lawns, flower beds and waste places, arable land, and roadsides."

305	Congeneric weed	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Sindel, B. M., & Michael, P. W. (1992). Spread and potential distribution of Senecio madagascariensis Poir. (fireweed) in Australia. Australian Journal of Ecology, 17 (1), 21-26	"Abstract The potential distribution of the herbaceous weed Senecio madagascariensis Poir. (fireweed) in Australia was estimated using the Bioclimate Prediction System, BIOCLIM. Climate profiles for S. madagascariensis predicted that suitable areas occurred only in the south-eastern region of Australia. Its potential to spread outside these areas was assessed by comparing the present African and South American distributions of this species with that observed in Australia. The rate of spread of S. madagascariensis in New South Wales was exponential, although in some regions, such as the Gloucester River Valley, the rates had decreased because all farms had become infested. The results indicate that S. madagascariensis may spread and increase in abundance along the far south coast of New South Wales and in south-eastern Queensland. Coastal areas in eastern Victoria and as far north in Queensland as the Tropic of Capricorn may be invaded."
	Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Senecio elegans" ... "It is invasive because it spreads rapidly and forms a continuous ground cover of dense growth, displacing native species and preventing their regeneration."

401	Produces spines, thorns or burrs	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.	"Erect or ascending annual herbs 1-4 dm tall, sparsely crinkly pubescent to subglabrous. Leaves oblanceolate in outline, 2-10 cm long, 0.5-4.5 cm wide, pinnately veined, coarsely pinnatifid, lower ones short-petiolate, quickly becoming sessile above, bases clasping the stem."

402	Allelopathic	
	Source(s)	**Notes**
	Qasem, J. R., & Hill, T. A. (1989). Possible role of allelopathy in the competition between tomato, Senecio vulgaris L. and Chenopodium album L. Weed Research, 29 (5), 349-356	[No evidence on tomatoes] "Summary. The allelopathic effect of Chenopodium album L. (fat-hen) and Senecio vulgaris L. (groundsel) on tomato (Lycopersicon esculentum Mill cv. Ailsa Craig) plants was investigated under glasshouse conditions. A new technology was used to separate competitive from allelopathic effects. These experiments suggested that C. album had an effect on tomato through allelopathy. C. album leach-ates significantly reduced shoot fresh and dry weights and the accumulation of N, P, K, Ca and Mg of tomato shoots. No effect was found on the quantities of these elements in tomato roots. Leachate of five plants of C. album per pot was sufficient to reduce tomato growth. Addition of 10 or 20 g kg−1 of C. album dried shoots to the soil mixture significantly decreased the fresh and dry weights of tomato plants. S. vulgaris leachates did not show significant effects on the growth or nutrient accumulation of tomato plants."

Qsn #	Question	Answer
403	Parasitic	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.	"Erect or ascending annual herbs 1-4 dm tall," [No evidence. Asteraceae]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"it serves as a favourite food for rabbits and the seeds are eaten by birds."
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	[Palatable, but toxic] "In addition to the general weediness of this plant, it also can cause chronic liver poisoning to horses, cattle, and swine, even if only a small amount is eaten over a few weeks' time."

405	Toxic to animals	y
	Source(s)	**Notes**
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	"The most harmful consequence of the weed is liver poisoning of livestock. It is important to control common groundsel in and around areas where livestock may graze."

406	Host for recognized pests and pathogens	y
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"A number of important crop viruses also infect this species. The beet mild yellowing virus (BMYV) and beet western yellows virus (BWYV) also infect sugar beet, Brassica napus L. (oilseed rape) and lettuce (Stevens et al. 1994). The tomato spotted wilt virus (TSWV) is vectored by Frankliniella occidentalis (Pergande), the western flower thrips, onto numerous vegetable and ornamental crops in southern British Columbia and many annual weeds there including S. vulgaris (Bitterlich and MacDonald 1993). The main source of spread of TSWV onto greenhouse plants was thrips feeding on winter annual weeds within 100 m of the greenhouses. The hosts of the pepper yellow vein virus (PYVA) includes S. vulgaris, Capsicum annuum L. (pepper), Solanum villosum Mill. (red nightshade), Solanum nigrum L. (black nightshade) and Crepis vesicaria L. (beaked hawk's-beard) (Rast 1992)."
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"The weed serves as a host for a wide range of agricultural pests attacking different economic crops worldwide (See Natural Enemies)."

407	Causes allergies or is otherwise toxic to humans	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Calflora. 2016. The Calflora Database. Berkeley, California: http://www.calflora.org/. [Accessed 29 Feb 2016]	"Toxicity: MINOR, DERMATITIS"
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Potentially, although probably not common] "Chemical tissue analysis of S. vulgaris has revealed the presence of free and N-oxide alkaloids (retrosine, seneciophyllinen, senecionine, spartioidine, usaramine and riddaline), mainly concentrated in the flower heads. The pyrrolizidine alkaloids are readily converted by the liver into toxic pyrroles causing liver disease in horses (Mendel et al., 1988). These alkaloids are also toxic to cattle, causing many livestock deaths and show significant effects on hepatic enzymes in rats (Kakrani and Kalyani, 1984). Several species of Senecio have been linked to human fatalities in incidents of bread poisoning, where seeds of other plant parts have been incorporated into bread for human consumption. In addition, the weed contains sesquiterpene lactone, and leaf extracts possess a low concentration of free amino acids."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	No evidence. Not listed among impacts
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	No evidence. Not listed among impacts

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	**Notes**
	Practical Plants. 2016. Senecio vulgaris. http://practicalplants.org/wiki/Senecio_vulgaris. [Accessed 29 Feb 2016]	"Has shade tolerance: No shade Has sun preference: Full sun"
	Learn 2 Grow. 2016. Senecio vulgaris. http://www.learn2grow.com/plants/senecio-vulgaris/. [Accessed 29 Feb 2016]	"Sun Exposure: Full Sun, Partial Sun"
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"This species grows as a weed in a wide range of habitats, including gardens, lawns, flower beds and waste places, arable land, and roadsides."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"It will grow on a range of soil types and nutrient levels, but nitrogen and calcium deficiencies reduced aboveground dry matter and seed production (Fenner 1986a). Plants grown in sand culture on modified Hoagland's solution were most sensitive to the absence of nitrogen and calcium, intermediate in sensitivity to potassium, phosphate and magnesium deficiency, and least limited by treatments missing sulphur and iron (Fenner 1986b). It typically grows on soils with a pH between 5.0 and 6.5 (Spurway 1941)."

411	Climbing or smothering growth habit	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.	"Erect or ascending annual herbs 1-4 dm tall, sparsely crinkly pubescent to subglabrous."

412	Forms dense thickets	
	Source(s)	**Notes**
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Many studies have reported this species as a noxious weed prevalent in most crops and causing yield losses in association with other weeds, yet it frequently escapes chemical control. In addition to the losses caused through direct competition, certain studies reported an allelopathic activity of S. vulgaris on certain species"
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	[Occurs in moderately high densities] "Over the past 20 yr, frequency of S. vulgaris increased from 1.7 to 16.1%, field density rose from 5.8 to 11.2 plants m–2, and relative abundance rank rose from #31 to #13, overall, in cereal and oilseed fields of Alberta (Thomas et al. 1998). In Saskatchewan between 1986 and 1995, its frequency dropped from 3.8 to 3.5%, mean density decreased from 7.0 to 3.4 plants m–2, and relative abundance rank fell from #24 to #30 (Thomas et al. 1996). S. vulgaris was not reported in weed surveys of arable fields in Manitoba between 1978 and 1997 (Thomas and Dale 1991; Thomas et al. 1997; Van Acker et al. 2000), though it is considered a nuisance weed of waste areas and is therefore considered a noxious weed there (Anonymous 1996)."

501	Aquatic	n
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	[Terrestrial] "This species colonizes newly cultivated soil and derelict urban land (Hull 1974)."

Qsn #	Question	Answer
502	**Grass**	**n**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Feb 2016]	Family: Asteraceae (alt.Compositae) Subfamily: Asteroideae Tribe: Senecioneae Subtribe: Senecioninae

503	**Nitrogen fixing woody plant**	**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.	"Erect or ascending annual herbs 1-4 dm tall, sparsely crinkly pubescent to subglabrous." [Asteraceae]

504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**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.	"Erect or ascending annual herbs 1-4 dm tall, sparsely crinkly pubescent to subglabrous. Leaves oblanceolate in outline, 2-10 cm long, 0.5-4.5 cm wide, pinnately veined, coarsely pinnatifid, lower ones short-petiolate, quickly becoming sessile above, bases clasping the stem."

601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	[No evidence] "S. vulgaris is a native of Eurasia, where it is widely distributed. It is found across mainland Europe from the Atlantic coasts to Bulgaria, also in Scandanavia, the British Isles and Eire. It is also widespread in Asia (Hultén 1968; Kadereit 1984)."
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	No evidence

Qsn #	Question	Answer
602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"S. vulgaris behaves like a summer annual (Nielsen and Pinnerup, 1982). Seed dormancy is part of the seasonal cycle and can be modified by temperature, nitrate levels and soil moisture (Karssen, 1980) whereas germination appears to be opportunistically fire-independent (Zammit and Zedler, 1994). Seeds have a very high capacity for germination within a wide range of temperatures 7-25 C (Kozhevnikova and Makhaeva, 1974) the optimum being 7-10°C."
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	"The success of common groundsel as a weed lies in its seeds. It starts developing seeds very early in its life cycle and can produce 25,000 or more seeds per plant under optimal conditions, although about 1,700 seeds per plant are more likely."

603	**Hybridizes naturally**	**y**
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"The endemic hexaploid species, S. cambrensis Rosser (Welsh ragwort, 2n = 60), originated as a result of hybridization between S. vulgaris and S. squalidus (Rosser 1955)." ... "Natural hybridization of S. vulgaris with S. vernalis resulted in the formation of a short-ligulate, sterile hybrid S. × helwingii Beger ex Hegi (2n = 30) in the Upper Golan region of Israel (Comes and Kadereit 1990)."

604	**Self-compatible or apomictic**	**y**
	Source(s)	**Notes**
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"S. vulgaris (a polyploid) has a worldwide distribution and a high self-pollinating ability (Gibbs et al., 1975). "
	Stebbins, G. L. (1957). Self fertilization and population variability in the higher plants. The American Naturalist, 91(861), 337-354	"There are several reasons for believing that this positive selective value has often aided in the establishment of self fertilizing types. In the first place, self fertilization is found in many field weeds adapted to highly favorable climates, which therefore have never been exposed to severe environments. Some well known examples are Senecio vulgaris (Haskell 1953), Stellaria media, Galeopsis spp., Vicia spp. and Sonchus oleraceus."

605	**Requires specialist pollinators**	**n**
	Source(s)	**Notes**
	Abbott, R. J., & Irwin, J. A. (1988). Pollinator movements and the polymorphism for outcrossing rate at the ray floret locus in Groundsel, Senecio vulgaris L.. Heredity, 60, 295-298	"Syrphid flies are the common pollinators of S. vulgaris in Scotland"
	Plants for a Future. 2016. Senecio vulgaris. http://www.pfaf.org/user/Plant.aspx?LatinName=Senecio+vulgaris. [Accessed 26 Feb 2016]	"The flowers are hermaphrodite (have both male and female organs) and are pollinated by Insects, self.The plant is self-fertile."

Qsn #	Question	Answer
606	**Reproduction by vegetative fragmentation**	**n**
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"S. vulgaris is a summer or winter annual, reproducing only by seed."

607	**Minimum generative time (years)**	**1**
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"S. vulgaris is a summer or winter annual, reproducing only by seed."

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**y**
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"Seeds are also carried into fields by irrigation water, in contaminated crop seeds, and on farm vehicles and equipment."

702	**Propagules dispersed intentionally by people**	**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 on Haleakala, Maui, and Parker Ranch and Ahumoa, Hawai'i, perhaps more widespread. First collected on Hawai'i in 1938 (Ewart III 178, BISH)." [Unlikely to have been intentionally introduced]
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	No evidence

703	**Propagules likely to disperse as a produce contaminant**	**y**
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"Seeds are also carried into fields by irrigation water, in contaminated crop seeds, and on farm vehicles and equipment."

704	**Propagules adapted to wind dispersal**	**y**
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"S. vulgaris seeds are dispersed by a number of methods (McHenry et al. 1990). The seeds are attached to pappi, plume-like structures that allow for wind dispersal along ditches, fencerows, roadsides and adjoining fields."

Qsn #	Question	Answer
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	"These seeds are easily spread by wind. Additionally, there can be three or more generations per year. Even when the plant is pulled from the ground or cut down, seeds from open flowers can still mature and germinate."
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Wind is the most important medium for the transport of S. vulgaris seeds (MacNaeidhe and Curran, 1982)."

705	Propagules water dispersed	y
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"Seeds are also carried into fields by irrigation water, in contaminated crop seeds, and on farm vehicles and equipment."

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"S. vulgaris seeds are dispersed by a number of methods (McHenry et al. 1990). The seeds are attached to pappi, plume-like structures that allow for wind dispersal along ditches, fencerows, roadsides and adjoining fields. Seeds are also carried into fields by irrigation water, in contaminated crop seeds, and on farm vehicles and equipment."
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Wind is the most important medium for the transport of S. vulgaris seeds" ... "it serves as a favourite food for rabbits and the seeds are eaten by birds." [Birds acts as seed predators]

707	Propagules dispersed by other animals (externally)	y
	Source(s)	**Notes**
	Couvreur, M., Christiaen, B., Verheyen, K., & Hermy, M. (2004). Large herbivores as mobile links between isolated nature reserves through adhesive seed dispersal. Applied Vegetation Science, 7(2): 229-236	"Table 1. Plant species identified in the fur of 201 large herbivores (*: in samples of herbivores transported between reserves)." [Senecio vulgaris seeds collected in the fur of Galloway cattle & horses]

708	Propagules survive passage through the gut	
	Source(s)	**Notes**
	Cosyns, E., Claerbout, S., Lamoot, I., & Hoffmann, M. (2005). Endozoochorous seed dispersal by cattle and horse in a spatially heterogeneous landscape. Plant Ecology, 178(2), 149-162	"Appendix A. Alphabetic ordered list of 49 plant species, within two functional groups, which were recorded less than 5 times from different dung samples of large herbivores (2.5 l) at Westhoek North and South." Includes Senecio vulgaris. Viability unspecified]
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"McHenry et al. (1990) observed that spreading manure from livestock fed with hay containing S. vulgaris seeds allowed for dispersal into crop fields, though seed viability and germination, and seedling recruitment were not determined after passage through animals' digestive tracts."

Qsn #	Question	Answer
801	**Prolific seed production (>1000/m2)**	**y**
	Source(s)	**Notes**
	PennState Extension. 2016. Weed of the Week– Common Groundsel (Senecio vulgaris). Posted: April 23, 2013. http://extension.psu.edu/plants/crops/news/2013/04/weed-of-the-week-2013-common-groundsel-senecio-vulgaris. [Accessed 29 Feb 2016]	"Common groundsel generally produces about 2000 seeds per plant depending on growing conditions. The seeds are easily spread by wind and unlike most plants; there can be more than one generation per year allowing populations to build fairly quickly."
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"The ability of this species to develop new morphs in nature, to produce a huge number of readily germinating seeds and its increasing tolerance to different herbicide groups may all contribute towards the existence and success of this weed as a major threat to agriculture."
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	"The success of common groundsel as a weed lies in its seeds. It starts developing seeds very early in its life cycle and can produce 25,000 or more seeds per plant under optimal conditions, although about 1,700 seeds per plant are more likely."
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	[Up to 13,300 seeds/m2 documented] "S. vulgaris plants in agricultural fields and roadside areas in the northwestern United States produced an average of approximately 38 300 seeds per plant, with a maximum of nearly 40 700 seeds per plant and 45 seeds per capitulum (Kempen and Graf 1981)." ... "Arable soil in one field in Scotland had a seed bank containing 590 S. vulgaris seeds m–2 to a depth of 20 cm (Lawson et al. 1992). In this field, Lawson et al. (1992) compared the practice of fallowing for 2 yr versus seeding plots to ryegrass or fescue. There were no differences among treatments, and on average, S. vulgaris seed numbers rose to 13 300 seeds m–2."

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Seed dormancy appears to be strongly related to habitat and geographical location. Ren and Abbott (1991, 1992) found that seeds of a Mediterranean population showed strong innate dormancy over a wide range of temperatures, enabling the species to adopt a winter annual life cycle, whereas those of British groundsel showed more than 80% germination at 20°C. Dormancy however, can be overcome by stratification, leaching, treatment with gibberellic acid alone or with kinetin, and by wounding the fruit and seed coat (Ren and Abbott, 1992)."
	DiTomaso, J. 2007. Weeds of California and Other Western States, Volume 1. UCANR Publications, Oakland, CA	"Seed dormancy varies among populations." ... "Seed longevity is poorly documented. In one case, seeds buried in a meadow were reported to survive for more than 50 years."
	PennState Extension. 2016. Weed of the Week– Common Groundsel (Senecio vulgaris). Posted: April 23, 2013. http://extension.psu.edu/plants/crops/news/2013/04/weed-of-the-week-2013-common-groundsel-senecio-vulgaris. [Accessed 29 Feb 2016]	"The good news is that the seeds are not very long lived, so good management can quickly reduce the seedbank."

Qsn #	Question	Answer
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	[ca. 1 year] "Seeds of common groundsel are not long-lived, usually remaining viable for about one year. Therefore, controlling this weed before flowering will have a great impact on the size of the next year's population."
	Figueroa, R., Doohan, D., Cardina, J., & Harrison, K. (2007). Common groundsel (Senecio vulgaris) seed longevity and seedling emergence. Weed Science, 55(3), 187-192	[Disturbances reduces seed bank longevity. Some seeds may persist for up to 2 years] "Results suggested that common groundsel follows a cycle of dormancy and nondormancy corresponding to decreases and increases, respectively, in soil temperature. During 2 yr of deep burial in undisturbed soil, 94% of the seeds germinated or died, suggesting that common groundsel seeds may not persist more than a few months in regularly disturbed soils."

803	Well controlled by herbicides	y
	Source(s)	**Notes**
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"A number of herbicides are available in Canada for control of S. vulgaris in field crops, vegetables, forages, and fruit crops..." ... "In herbaceous ornamentals in North Carolina, USA, several herbicides controlled S. vulgaris, including acifluorfen (1.1 kg ha–1), lactofen (1.1 kg ha–1), oryzalin (4.5 kg ha–1), isoxaben (1.1 kg ha–1), oxadiazon (4.5 ka ha–1), oxyfluorfen + pendimethalin (2.2 + 1.1 kg ha–1), and oxyfluorfen + oryzalin (2.2 + 1.1 kg ha–1)."
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	"Common groundsel in the home garden and landscape is best controlled using cultural and mechanical methods. If these methods cannot be used, herbicides containing diquat or glyphosate will control growing plants in home landscape beds. Only glyphosate can be used around edible crops and it will severely injure or kill any plant it touches. The sprayer tip should be shielded so that the spray does not contact any desirable plants, as either of these herbicides will injure many ornamental plants. There are no preemergent (before the plant emerges from the soil) chemical controls available for home use that are effective for controlling common groundsel."
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Some herbicides are effective] "A vast quantity of literature is available on chemical control, and a great number of herbicides have proved to be very effective in different crops. More importantly, a large number of herbicides have failed to affect the weed, some even encouraging growth or population levels (van Himme et al., 1981). However, the effectiveness of herbicides depends on time, rate, method of application and crop stage. Results of different experiments have confirmed the importance of herbicide mixtures or the combination of chemicals with cultural and mechanical methods of weed control."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"A combination of cultural and chemical control methods were effective against different weeds, including S. vulgaris, in lupins (Jambrina, 1983). Boydston (1995) found that rototilling without herbicides in the spring and at layby in asparagus gave best control, whereas Tessier and Leroux (1994) reported best control of S. vulgaris in broccoli using an intercropping system, by sowing the intercrop 25 days after transplanting combined with two cultivations. Intercropping can be performed using red clover, and winter or annual ryegrass. Plastic mulch and pre sowing soil solarization proved to be effective in strawberries (MacGiolla, 1989); spring tillage in spring wheat (Arshad et al., 1994) was also good for crop flowering, yield and control of weed populations including S. vulgaris. Ploughing (10-14 cm deep) in the autumn or spring suppressed S. vulgaris in peppermint, whereas disking (5-9 cm deep) was not sufficient to control this weed (Talkington and Berry, 1986)."
	Robinson, D. E., O'Donovan, J. T., Sharma, M. P., Doohan, D. J., & Figueroa, R. (2003). The biology of Canadian weeds. 123. Senecio vulgaris L. Canadian Journal of Plant Science, 83(3), 629-644	"Fall or spring plowing to depths of 10 to 14 cm reduced emergence of S. vulgaris, while disking to 9 cm did not provide sufficient control to eliminate yield losses in Mentha piperita L. (peppermint) grown in Oregon, USA (Talkington and Berry 1986)."
	Wilen, C. A. (2006). Common Groundsel. Integrated Pest Management for Home Gardeners and Landscape Professionals. Pest Notes. Publication 74130. University of California, Agriculture and Natural Resources, Oakland, CA. http://www.ipm.ucdavis.edu. [Accessed 26 Feb 2016]	"Shallow tilling or hoeing of young plants effectively controls common groundsel. Start monitoring for seedlings in early fall and remove seedlings and plants as soon as possible. Monitoring should continue through early summer. Even if all the weeds in your garden are controlled, common groundsel may still infest the area from seeds that are blown in from nearby sites." ... "In most situations, common groundsel is easily controlled by hand removal or cutting the plant off at its taproot by hoeing." ... "In larger areas, rototilling of young plants is effective. Mowing can be effective if the blade is set as close to the ground as possible."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**

Qsn #	Question	Answer
	CABI, 2016. Senecio vulgaris. In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Despite the wide range of natural enemies reported as attacking S. vulgaris, only two fungal species (Erysiphe fischeri and Puccinia lagenophorae) have been tested as biological control agents. Plants infected with E. fischeri continued growing to set seeds even when 75-100% of the aerial parts were colonized but dry matter production of the weed was markedly reduced (Clarke et al., 1979). Under glasshouse conditions, P. lagenophorae infection reduced weed dry weight both in pure and mixed stands with lettuce. The fungus inhibited leaf expansion and production of capitula, reduced the number of flowering plants and led to more rapid and early senescence of the weed whereas mature, infected, flowering plants died earlier and more rapidly than healthy plants (Paul and Ayres, 1987).The high death rate occurring among autumn-inoculated plants was due to infection of the hypocotyl which was always killed within 1-2 weeks. However, heavily-infected plants were still able to produce some capitula and potentially set seed. Inoculation of plants bearing aecia of P. lagenophorae with an isolate of Puccinia intermedium caused 50% death of hosts 18 days after inoculation and 37 days after inoculation with Gibberella avenacea (Hallett and Ayres, 1992). In a different study, Ascard and Jonasson (1991) reported good control of S. vulgaris in cabbage fields using meal of seed residues of mustard (Sinapis alba)."
	Ramadan, M. M., Murai, K. T., & Johnson, T. 2011. Host range of Secusio extensa (Lepidoptera: Arctiidae), and potential for biological control of Senecio madagascariensis (Asteraceae). Journal of Applied Entomology, 135(4): 269-284	[Potentially. S. vulgaris is a suitable alternate host] "Secusio extensa (Lepidoptera: Arctiidae) was evaluated as a potential biological control agent for Madagascar fireweed, Senecio madagascariensis (Asteraceae), which has invaded over 400 000 acres of rangeland in the Hawaiian Islands and is toxic to cattle and horses. The moth was introduced from southeastern Madagascar into containment facilities in Hawaii, and host specificity tests were conducted on 71 endemic and naturalized species (52 genera) in 12 tribes of Asteraceae and 17 species of non-Asteraceae including six native shrubs and trees considered key components of Hawaiian ecosystems. No-choice feeding tests indicated that plant species of the tribe Senecioneae were suitable hosts with first instars completing development to adult stage on S. madagascariensis (78.3%), Delairea odorata (66.1%), Senecio vulgaris (57.1%), Crassocephalum crepidioides (41.2%), and at significantly lower rates on Emilia fosbergii (1.8%) and Erechtites hieracifolia (1.3%). A low rate of complete larval development also was observed on sunflower, Helianthus annuus (11.6%), in the tribe Heliantheae. However, sunflower was rejected as a potential host in larval-feeding and adult oviposition choice tests involving the primary host S. madagascariensis as control. Although larvae died as first instars on most test species, incomplete development and low levels of feeding were observed on nine species in the tribes Heliantheae, Cardueae and Lactuceae. Larvae did not feed on any non-Asteraceae tested, including species with similar pyrrolizidene alkaloid chemistry, crops, and six ecologically prominent native species. Because all species of Senecioneae are non-native and weedy in Hawaii, these results indicate that S. extensa is sufficiently host-specific for introduction for biological control. High levels of feeding damage observed on potted plants indicate that S. extensa can severely impact the target fireweed as well as D. odorata, a noxious weed in native Hawaiian forests."

Qsn #	Question	Answer

Summary of Risk Traits:

High Risk / Undesirable Traits
• Broad climatic & environmental versatility
• A temperate species naturalized in areas with tropical or subtropical climates
• Widely naturalized, including on Maui & Hawaii islands
• A weed of gardens, lawns, flower beds, waste places, arable land, roadsides & several crops
• Other Senecio species are invasive weeds
• May poison livestock
• Host of crop viruses
• Tolerates many soil types
• Reproduces by seed
• Hybridizes with other Senecio species
• Self-fertile
• Reaches maturity rapidly (<1 year)
• Seeds dispersed by wind, water, in contaminated crop seeds, and on farm vehicles & equipment
• Prolific seed production
• Seeds may persist in the soil, although longevity varies
• May be resistant to some herbicides

Low Risk Traits
• A temperate species that may be more invasive at higher elevations of tropical or subtropical regions
• Unarmed (no spines, thorns or burrs)
• Palatable to animals (although toxic)
• Primarily grows in high light environments
• Not reported to spread vegetatively
• Some herbicides provide effective control
• Hand-pulling, cutting & cultivation practices may provide effective control