

Family: *Brassicaceae*

Taxon: *Thlaspi arvense*

Synonym: *Common Name:* bastard cress
fanweed
field pennycress
Frenchweed
Mithridate mustard
pennycress
stinkweed
wild garlic

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation: H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	WRA Score 19
101	Is the species highly domesticated?		y=-3, n=0	n
102	Has the species become naturalized where grown?		y=1, n=-1	
103	Does the species have weedy races?		y=1, n=-1	
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		y=1, n=0	
403	Parasitic		y=1, n=0	n
404	Unpalatable to grazing animals		y=1, n=-1	
405	Toxic to animals		y=1, n=0	y
406	Host for recognized pests and pathogens		y=1, n=0	
407	Causes allergies or is otherwise toxic to humans		y=1, n=0	n

408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	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	
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	y
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	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
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	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score 19

Supporting Data:

101	2012. WRA Specialist. Personal Communication.	[Is the species highly domesticated? No] No evidence of domestication that reduces invasive traits.
102	2012. WRA Specialist. Personal Communication.	[Has the species become naturalized where grown? NA]
103	2012. WRA Specialist. Personal Communication.	[Does the species have weedy races? NA]
201	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"? 2 - high] Native distribution: Afghanistan; Iran; Turkey; Amernia; Azerbaijan; Georgia; Russian Federation - Eastern Siberia, Western Siberia; Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan; Mongolia; Russian Federation - Far East; China; Japan; Korea; Bhutan; India; Nepal; Pakistan; Denmark; Denmark; Finland; Ireland; Norway; Sweden; United Kingdom; Austria; Belgium; Czech Republic; Germany; Hungary; Netherlands; Poland; Slovakia; Switzerland; Belarus; Estonia; Latvia; Lithuania; Moldova; Russian Federation - European part; Ukraine [incl. Krym]; Albania; Bosnia and Herzegovina; Bulgaria; Croatia; Greece [n.]; Italy; Macedonia; Montenegro; Romania; Serbia; Slovenia; France; Spain
202	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Quality of climate match data? 2 - high] Native distribution: Afghanistan; Iran; Turkey; Amernia; Azerbaijan; Georgia; Russian Federation - Eastern Siberia, Western Siberia; Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan; Mongolia; Russian Federation - Far East; China; Japan; Korea; Bhutan; India; Nepal; Pakistan; Denmark; Denmark; Finland; Ireland; Norway; Sweden; United Kingdom; Austria; Belgium; Czech Republic; Germany; Hungary; Netherlands; Poland; Slovakia; Switzerland; Belarus; Estonia; Latvia; Lithuania; Moldova; Russian Federation - European part; Ukraine [incl. Krym]; Albania; Bosnia and Herzegovina; Bulgaria; Croatia; Greece [n.]; Italy; Macedonia; Montenegro; Romania; Serbia; Slovenia; France; Spain
203	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Broad climate suitability (environmental versatility)? Yes] <i>Thlaspi arvense</i> occurs in dry and wet habitats, from exposed knolls to moist valley, from sea-level to an altitude of 2,739 m in Colorado.
204	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Native or naturalized in regions with tropical or subtropical climates? Yes] Native distribution: Afghanistan; Iran; Turkey; Amernia; Azerbaijan; Georgia; Russian Federation - Eastern Siberia, Western Siberia; Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan; Mongolia; Russian Federation - Far East; China; Japan; Korea; Bhutan; India; Nepal; Pakistan; Denmark; Denmark; Finland; Ireland; Norway; Sweden; United Kingdom; Austria; Belgium; Czech Republic; Germany; Hungary; Netherlands; Poland; Slovakia; Switzerland; Belarus; Estonia; Latvia; Lithuania; Moldova; Russian Federation - European part; Ukraine [incl. Krym]; Albania; Bosnia and Herzegovina; Bulgaria; Croatia; Greece [n.]; Italy; Macedonia; Montenegro; Romania; Serbia; Slovenia; France; Spain. Naturalized in : Portugal; Algeria; Morocco; South Africa; Australia; New Zealand; Finland; Norway; Canada; United States; Brazil; Argentina; Chile.
205	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Does the species have a history of repeated introductions outside its natural range? Yes] <i>Thlaspi</i> is widely distributed in the northern United States and Canada. Introduced as early as 1860 in Manitoba, Quebec in 1865, Ottawa in 1878, throughout the United Sates from Maine to Florida and westward to California by 1937. It was recorded in New South Wales for the first time in 1935
301	2002. Warwick, S.I./Francis, A./Susko, D.J.. The biology of Canadian weeds. 9. <i>Thlaspi arvens</i> L. (Updated). Canadian Journal of Plant Science. 82: 803-823.	[Naturalized beyond native range? Yes] <i>Thlaspi</i> is naturalized and widely spread in temperate regions of the northern hemisphere, including all of Canada's provinces and territories, and has recently spread to temperate regions in the southern hemisphere
301	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Naturalized beyond native range? Yes] Naturalized in : Portugal; Algeria; Morocco; South Africa; Australia; New Zealand; Finland; Norway; Canada; United States; Brazil; Argentina; Chile.
302	2002. Warwick, S.I./Francis, A./Susko, D.J.. The biology of Canadian weeds. 9. <i>Thlaspi arvens</i> L. (Updated). Canadian Journal of Plant Science. 82: 803-823.	[Garden/amenity/disturbance weed? Yes] " <i>Thlaspi arvense</i> occurs in a wide variety of habitats in Canada: spring cereals and other grains, hay, canola, safflower, forage and other field crops, small fruit crops, gardens, rangeland, irrigated areas and sloughs, meadows, pastures, roadsides, railways, wharves and waste places; and naturally disturbed habitats including beaches, rock outcrops, and talus."

302	2012. U.S. Forest Service Region 9. Eastern Region invasive plants, ranked by degree of invasiveness as based on information from States. United States Forest Service, http://www.fs.fed.us/r9/wildlife/range/weed/Sec3B.htm	[Garden/amenity/disturbance weed? Yes] Considered to be a weed of disturbed areas in the United States Forest Service Eastern Region.
303	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Agricultural/forestry/horticultural weed? Yes] <i>Thlaspi arvense</i> is a serious agricultural weed in the Prairie Provinces of Canada, where it competes with crops for a limited moisture supply, causing significant reductions in yield.
304	2012. WRA Specialist. Personal Communication.	[Environmental weed? No] No evidence of negative impact to natural ecosystems.
305	2007. Randall, R.P.. Global Compendium of Weeds - Index. http://www.hear.org/gcw/	[Congeneric weed? No] No evidence.
401	2012. eFloras. <i>Thlaspi arvense</i> Published on the Internet http://efloras.org [accessed 17 July 2012]. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA,	[Produces spines, thorns or burrs? No] "Herbs annual, (9-)15-55(-80) cm tall, glabrous throughout, often glaucous, fetid when crushed. Stems erect, simple or branched above. Petiole of basal leaves 0.5-3 cm; leaf blade oblanceolate, spatulate, or obovate, 1-5 x 0.4-2.3 cm, base attenuate or cuneate, margin entire, repand, or coarsely toothed, apex rounded. Middle cauline leaves sessile, oblong, (0.5-)1.5-4(-8) x (0.2-)0.5-1.5(-2.5) cm, base sagittate or auriculate, margin dentate, repand, or entire, apex rounded, obtuse, or subacute."
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Parasitic? No] Brassicaceae.
404	2012. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals? Unknown]
405	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Toxic to animals? Yes] Livestock feeding on considerable quantities of ground seeds may develop chronic enteritis, hemorrhagic diarrhea, colic, abortion, nephritis and haematuria.
405	2007. Bond, W./Davies, G./Turner, R.. The biology and non-chemical control of field pennycress (<i>Thlaspi arvense</i> L.). HDRA, Ryton Organic Gardens, Coventry http://www.gardenorganic.org.uk/organicweeds	[Toxic to animals? Yes] "The seeds contain a glucoside that breaks down to form a mustard oil that can cause poisoning in stock."
406	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Host for recognized pests and pathogens?] <i>Thlaspi</i> is a host for the sugar beet eel worm (<i>Heterodera schachtii</i> Schmidt) and the fungus <i>Plenodomus</i> (<i>Phoma</i>) <i>lingam</i> (Tode ex Fr.) Desm.
407	2002. Warwick, S.I./Francis, A./Susko, D.J.. The biology of Canadian weeds. 9. <i>Thlaspi arvensis</i> L. (Updated). Canadian Journal of Plant Science. 82: 803-823.	[Causes allergies or is otherwise toxic to humans? No] <i>Thlaspi arvense</i> is a popular food plant in various parts of the world and is often cultivated in Europe.
407	2012. Plants for a Future Database. <i>Thlaspi arvense</i> - L.. http://www.pfaf.org/user/Plant.aspx?LatinName=Thlaspi+arvense	[Causes allergies or is otherwise toxic to humans? No] The leaves and seeds of the plant are edible.
408	2012. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? No] No evidence.
409	2010. Nawrocki, T.. <i>Thlaspi arvense</i> . Alaska Natural Heritage Program, Anchorage http://aknhp.uaa.alaska.edu	[Is a shade tolerant plant at some stage of its life cycle? No] Shade intolerant.
409	2012. Plants for a Future Database. <i>Thlaspi arvense</i> - L.. http://www.pfaf.org/user/Plant.aspx?LatinName=Thlaspi+arvense	[Is a shade tolerant plant at some stage of its life cycle? No] Shade intolerant.
410	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] The distribution of <i>Thlaspi</i> is not affected by soil type.

410	2012. Plants for a Future Database. <i>Thlaspi arvense</i> - L.. http://www.pfaf.org/user/Plant.aspx?LatinName=Thlaspi+arvense	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] Suitable for: light (sandy), medium (loamy) and heavy (clay) soils. Suitable pH: acid, neutral and basic (alkaline) soils.
411	2012. eFloras. <i>Thlaspi arvense</i> Published on the Internet http://efloras.org [accessed 17 July 2012]. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA,	[Climbing or smothering growth habit? No] "Herbs annual, (9-)15-55(-80) cm tall."
412	2012. eFloras. <i>Thlaspi arvense</i> Published on the Internet http://efloras.org [accessed 17 July 2012]. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA,	[Forms dense thickets? No] "Herbs annual, (9-)15-55(-80) cm tall."
501	2012. eFloras. <i>Thlaspi arvense</i> Published on the Internet http://efloras.org [accessed 17 July 2012]. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA,	[Aquatic? No] "Herbs annual, (9-)15-55(-80) cm tall."
502	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Grass? No] Brassicaceae.
503	2012. eFloras. <i>Thlaspi arvense</i> Published on the Internet http://efloras.org [accessed 17 July 2012]. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA,	[Nitrogen fixing woody plant? No] "Herbs annual, (9-)15-55(-80) cm tall"
504	2012. eFloras. <i>Thlaspi arvense</i> Published on the Internet http://efloras.org [accessed 17 July 2012]. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA,	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Herbs annual, (9-)15-55(-80) cm tall>"
601	2012. WRA Specialist. Personal Communication.	[Evidence of substantial reproductive failure in native habitat? No] No evidence.
602	2002. Warwick, S.I./Francis, A./Susko, D.J.. The biology of Canadian weeds. 9. <i>Thlaspi arvens</i> L. (Updated). Canadian Journal of Plant Science. 82: 803-823.	[Produces viable seed? Yes] <i>Thlaspi arvense</i> has a persistent seed bank of up to 20 years (viable seeds).
602	2007. Bond, W./Davies, G./Turner, R.. The biology and non-chemical control of field pennycress (<i>Thlaspi arvense</i> L.). HDRA, Ryton Organic Gardens, Coventry http://www.gardenorganic.org.uk/organicweeds	[Produces viable seed? Yes] Viable seeds have been found in pigeon droppings and seedlings have been raised from the excreta of various birds.
603	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Hybridizes naturally?] No evidence of hybridization has been noted.
604	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Self-compatible or apomictic? Yes] Self-compatible.
604	2007. Bond, W./Davies, G./Turner, R.. The biology and non-chemical control of field pennycress (<i>Thlaspi arvense</i> L.). HDRA, Ryton Organic Gardens, Coventry http://www.gardenorganic.org.uk/organicweeds	[Self-compatible or apomictic? Yes] Generally self-pollinated.
605	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Requires specialist pollinators? No] Insect pollinated by species in the Lepidoptera, Hymenoptera, and Diptera.
606	2002. Warwick, S.I./Francis, A./Susko, D.J.. The biology of Canadian weeds. 9. <i>Thlaspi arvens</i> L. (Updated). Canadian Journal of Plant Science. 82: 803-823.	[Reproduction by vegetative fragmentation? No] There is no evidence of vegetative reproduction.
607	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Minimum generative time (years)? 1] Annual.

701	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Yes] <i>Thlaspi arvense</i> is a serious agricultural weed in the Prairie Provinces of Canada, where it competes with crops for a limited moisture supply, causing significant reductions in yield.
702	2010. Arvens Technology Inc.. Grow pennycress. http://www.growpennycress.com/index.html	[Propagules dispersed intentionally by people? Yes] <i>Thlaspi arvense</i> is being promoted as a biofuel crop by Arvens Technology Inc. for production in Illinois and possibly other cornbelt states.
702	2012. Evangelista, R.L./Isbell, T.A./Cermak, S.C.. Extraction of pennycress (<i>Thlaspi arvense</i> L.) seed oil full pressing. Industrial Crops and Products. 37: 76-81.	[Propagules dispersed intentionally by people? Yes] "Pennycress is currently being developed as an oilseed crop for biofuel production. Pennycress seeds harvested from a field near Peoria, Illinois, provided our first opportunity to conduct an oil extraction study on a pilot scale."
702	2012. Sidhu, V./Fonti, V./Datta, R./Sarkar, D.. A feasibility study on the potential of stabilization of copper contaminated soils by two biofuels feedstock - field pennycress (<i>Thlaspi arvense</i>) and Camelina (<i>Camelina sativa</i>).	[Propagules dispersed intentionally by people? Yes] A feasibility study of the potential of stabilization of copper contaminated soils using <i>Thlaspi arvense</i> feedstock was conducted at Montclair State University.
703	2002. Warwick, S.I./Francis, A./Susko, D.J.. The biology of Canadian weeds. 9. <i>Thlaspi arvens</i> L. (Updated). Canadian Journal of Plant Science. 82: 803-823.	[Propagules likely to disperse as a produce contaminant? Yes] In Manitoba, <i>Thlaspi arvense</i> spread as a contaminant of wheat and barley.
704	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Propagules adapted to wind dispersal? Yes] Dispersal is chiefly by wind.
705	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Propagules water dispersed? Yes] Ninety percent of <i>Thlaspi</i> seed floated on still water for 24 hours.
706	2007. Bond, W./Davies, G./Turner, R.. The biology and non-chemical control of field pennycress (<i>Thlaspi arvense</i> L.). HDRA, Ryton Organic Gardens, Coventry http://www.gardenorganic.org.uk/organicweeds	[Propagules bird dispersed? Yes] "Viable seeds have been found in pigeon droppings and seedlings have been raised from the excreta of various birds."
707	2012. eFloras. <i>Thlaspi arvense</i> Published on the Internet http://efloras.org [accessed 17 July 2012]. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA,	[Propagules dispersed by other animals (externally)? No] "Fruit obovate or suborbicular, (0.6-)0.9-2 × (0.5-)0.7-2 cm, base obtuse or rounded, apex deeply emarginate and apical notch ca. 5 mm deep." [no means of external attachment]
708	2007. Bond, W./Davies, G./Turner, R.. The biology and non-chemical control of field pennycress (<i>Thlaspi arvense</i> L.). HDRA, Ryton Organic Gardens, Coventry http://www.gardenorganic.org.uk/organicweeds	{Propagules survive passage through the gut? Yes} "Viable seeds have been found in pigeon droppings and seedlings have been raised from the excreta of various birds."
801	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Prolific seed production (>1000/m ²)? Yes] <i>Thlaspi</i> is a prolific seeder; a single plant may produce from 1,600 to 15,000 seeds.
801	2007. Bond, W./Davies, G./Turner, R.. The biology and non-chemical control of field pennycress (<i>Thlaspi arvense</i> L.). HDRA, Ryton Organic Gardens, Coventry http://www.gardenorganic.org.uk/organicweeds	[Prolific seed production (>1000/m ²)? Yes] "Field penny-cress has approximately 12 seeds per fruit and 20,000 seeds per plant according to Long (1938). The average seed number per plant is 1,023 (Pawlowski et al., 1970). Salisbury (1961) gives the average seeds per fruit as 16 and the average seeds per plant as 2,000. Stevens (1932) gives the average seeds per plant as 7,040, Stevens (1957) quotes 900 to 2,000 seeds per plant while Best & McIntyre (1975a) suggest a single plant will produce 1,600 to 15,000 seeds. Guyot et al. (1962) give the seed number per plant as 800 to 1,000."
802	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Evidence that a persistent propagule bank is formed (>1 yr)? Yes] Research indicates that 87% of seed buried in the soil for 9 years were still viable. Another study indicated that even after 20 year burial in soil, some seeds were still capable of germinating.
802	2002. Warwick, S.I./Francis, A./Susko, D.J.. The biology of Canadian weeds. 9. <i>Thlaspi arvens</i> L. (Updated). Canadian Journal of Plant Science. 82: 803-823.	[Evidence that a persistent propagule bank is formed (>1 yr)? Yes] <i>T. arvense</i> has a persistent seed bank that can last 20 yr or more.
802	2010. Partzsch, M.. Germination biology of eight short-living ruderal and segetal species. <i>Hercynia</i> . 43: 149-166.	[Evidence that a persistent propagule bank is formed (>1 yr)? Yes] This seed bank experiment indicates that <i>Thlaspi arvense</i> has a persistent seed bank. Seeds buried in the soil did not significantly break dormancy after one year.

803	1975. Best, K.F./McIntyre, G.I.. The biology of Canadian weeds 9. <i>Thlaspi arvense</i> . Canadian Journal of Plant Science. 55: 279-292. http://pubs.aic.ca/doi/pdf/10.4141/cjps75-039	[Well controlled by herbicides?] <i>Thlaspi</i> is very susceptible to amine and ester formulations of 2, 4-D-mecoprop; linuron-MCPA; dichlorprop-2, 4-D.
803	2002. Warwick, S.I./Francis, A./Susko, D.J.. The biology of Canadian weeds. 9. <i>Thlaspi arvens</i> L. (Updated). Canadian Journal of Plant Science. 82: 803-823.	[Well controlled by herbicides?] <i>Thlaspi arvense</i> can be adequately controlled in cereal crops by 2,4-D, MCPA, or mixtures containing them. A herbicide-resistant biotype of <i>T. arvense</i> to the Group 2 herbicides, which inhibit acetolactate synthase (ALS) was found in Alberta in 2001.
804	2012. WRA Specialist. Personal Communication.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Unknown]
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk Traits:

- Native to tropical regions
- Wide environmental tolerance
- Widely naturalized
- Disturbance weed
- Agricultural weed
- Toxic to animals
- Tolerant of wide variety of soil conditions
- Persistent seed bank
- Self-compatible
- Short reproductive time
- Crop contaminant
- Dispersed by wind, animals, water, accidentally
- Prolific seeder
- Herbicide resistant

Low Risk Traits:

- Not parasitic
- Non-toxic to humans
- Shade intolerant
- Not a nitrogen-fixer