

Taxon: Artemisia absinthium L.	Family: Asteraceae
Common Name(s): absinthe absinthe wormwood absinthium wormwood	Synonym(s):

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 3 Dec 2020
WRA Score: 10.0	Designation: H(HPWRA)	Rating: High Risk

Keywords: Perennial Herb, Agricultural Weed, Toxic Properties, Shade-tolerant, Prolific Seeder

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		
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
304	Environmental weed		
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		
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
408	Creates a fire hazard in natural ecosystems		

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	y
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	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	n
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation		
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	2
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant		
704	Propagules adapted to wind dispersal	y=1, n=-1	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	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)	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	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
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Long history of use, but not domesticated] "Native to northern Africa and the temperate portions of Europe and Asia, wormwood has since antiquity been used medicinally and as the source of a strong liqueur."
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	[No evidence] "Absinth, as with a great many herbs used in the sixteenth century, produced widely touted folk medicines with almost magical properties that were used in such diverse ways as enhancing fertility, inducing abortions, breaking up gall stones, restoring the memory, and warding off travel fatigue and dangerous, poisonous animals (Mitich 1975). Absinth is still a valued herb for medicines especially in Europe and studies of its culture (Galambosi 1981) and analysis and synthesis of the essential oils found in the leaves, seeds and roots represent a considerable amount of information (Rice and Wilson 1976; Greger 1978, 1979, 1981; Greger and Hofer 1980)."

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

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	Intermediate
	Source(s)	Notes

Qsn #	Question	Answer
	<p>USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 30 Nov 2020]</p>	<p>"Native Africa NORTHERN AFRICA: Algeria, Morocco Asia-Temperate WESTERN ASIA: Afghanistan, Iran, Turkey CAUCASUS: Armenia, Azerbaijan, Georgia SIBERIA: Russian Federation-Western Siberia [Western Siberia], Russian Federation-Eastern Siberia [Eastern Siberia] MIDDLE ASIA: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan CHINA: China [Xinjiang Uygur Zizhiqu (n.)] Asia-Tropical INDIAN SUBCONTINENT: India [Jammu and Kashmir] Europe NORTHERN EUROPE: Denmark, Finland, United Kingdom, Ireland, Norway, Sweden MIDDLE EUROPE: Austria, Belgium, Switzerland, Czech Republic, Germany, Hungary, Netherlands, Poland EASTERN EUROPE: Russian Federation-European part [European part], Belarus, Estonia, Lithuania, Latvia, Moldova, Ukraine (incl. Krym) SOUTHEASTERN EUROPE: Albania, Bulgaria, Bosnia and Herzegovina, Greece, Croatia, Italy, North Macedonia, Montenegro, Romania, Serbia, Slovenia SOUTHWESTERN EUROPE: Spain, France (incl. Corsica), Portugal"</p>
	<p>Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall</p>	<p>"Preferred Climate/s: Dryland, Mediterranean, Subtropical, Tropical"</p>

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

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	" <i>Artemisia absinthium</i> does best with an abundant moisture supply. Selleck and Coupland (1959, 1961) attributed the prevalence of the weed in Saskatchewan from 1950 to 1956 to above average moisture but it was not able to maintain its aggressiveness and vigor during the dry weather of 1957-1959. During prolonged dry spells when absinth may die out on coarse gravel soils, it maintains itself in ravines and on north-facing slopes where snow may accumulate and then melt slowly in the spring. The Canadian distribution of absinth approximates roughly with areas within the zone of 1800-2200 degree days above 5. 6°C and at least 90 frost free days in Alberta and Saskatchewan."
	Plants for a Future. (2020). <i>Artemisia absinthium</i> . https://pfaf.org . [Accessed 1 Dec 2020]	"USDA hardiness 4-9" [6 hardiness zones]

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Native to northern Africa and the temperate portions of Europe and Asia, wormwood has since antiquity been used medicinally and as the source of a strong liqueur."
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 1 Dec 2020]	"Native Africa NORTHERN AFRICA: Algeria, Morocco Asia-Temperate WESTERN ASIA: Afghanistan, Iran, Turkey CAUCASUS: Armenia, Azerbaijan, Georgia SIBERIA: Russian Federation-Western Siberia [Western Siberia], Russian Federation-Eastern Siberia [Eastern Siberia] MIDDLE ASIA: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan CHINA: China [Xinjiang Uygur Zizhiqu (n.)] Asia-Tropical INDIAN SUBCONTINENT: India [Jammu and Kashmir] Europe NORTHERN EUROPE: Denmark, Finland, United Kingdom, Ireland, Norway, Sweden MIDDLE EUROPE: Austria, Belgium, Switzerland, Czech Republic, Germany, Hungary, Netherlands, Poland EASTERN EUROPE: Russian Federation-European part [European part], Belarus, Estonia, Lithuania, Latvia, Moldova, Ukraine (incl. Krym) SOUTHEASTERN EUROPE: Albania, Bulgaria, Bosnia and Herzegovina, Greece, Croatia, Italy, North Macedonia, Montenegro, Romania, Serbia, Slovenia SOUTHWESTERN EUROPE: Spain, France (incl. Corsica), Portugal"

205	Does the species have a history of repeated introductions outside its natural range?	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	" <i>Artemisia absinthium</i> is a frequent plant of waste places throughout the British Isles north to Aberdeen, Ross and Orkney. It is found over most of Europe and temperate Asia northwards to Lapland, Karelia and southern Siberia. It is an introduction in North and South America and New Zealand (Clapham et al. 1962). The weed has become naturalized in every province from Newfoundland to British Columbia north to Moosinee and the Peace River district (Scoggan 1978) (Fig. 2). It is found across the northern United States and occasionally as far south as North Carolina in the east (Mitich 1975; Fernald 1950)."
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 30 Nov 2020]	"Naturalized (widely natzd. elsewhere)"
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Cultivated in Hawaii] "Native to northern Africa and the temperate portions of Europe and Asia, wormwood has since antiquity been used medicinally and as the source of a strong liqueur."

301	Naturalized beyond native range	y
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 30 Nov 2020]	"Naturalized (widely natzd. elsewhere)"
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	"The weed has become naturalized in every province from Newfoundland to British Columbia north to Moosinee and the Peace River district (Scoggan 1978) (Fig. 2). It is found across the northern United States and occasionally as far south as North Carolina in the east (Mitich 1975; Fernald 1950)."
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence to date

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/a1.html . [Accessed]	[Disturbance adapted plant which can negatively impact agriculture] " <i>Absinthium</i> grows on disturbed sites such as along fencelines and roadsides, on borrow pits and gravel piles, and on overgrazed pastures and fields recently abandoned from cultivation [15]."

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

Qsn #	Question	Answer
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/al.html . [Accessed 25 Nov 2020]	" <i>Absinthium</i> is considered a weed in pastureland, cropland, and rangeland in the northern Great Plains [14,15]. Although it spreads rapidly on disturbed sites, it is easily controlled by herbicides and/or vigorous competition from grasses [14]. Picloram provides the most rapid and complete control of <i>absinthium</i> , but dicamba, 2,4-D, and glyphosate are also effective. Application techniques are described [14,15]."
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	"Generally, the weed is found along the edges of fields but occasionally it can become very dense and may invade a pasture in a relatively short time (Mitich 1975). Although milk may be tainted by <i>absinth</i> and grain from infested fields may be graded "rejected" or be refused at the elevator because of the danger of tainting flour (Craig 1957; Selleck and Coupland 1961), the incidence of such occurrences at the present time is not great." ... " <i>Absinth</i> is listed in the schedule of noxious weeds in the Manitoba Noxious Weeds Act, revised statutes (Anonymous 1971). No other province or federal weed control legislation has listed <i>absinth</i> as a noxious weed."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Cereals, Grapevines, Nursery Production, Orchards & Plantations, Pastures, Vegetables"

304	Environmental weed	
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	[Agricultural weed] "Generally, the weed is found along the edges of fields but occasionally it can become very dense and may invade a pasture in a relatively short time (Mitich 1975)."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Primarily a weed of agricultural settings, but also cited as a potential environmental weed] "Weed of: Cereals, Grapevines, Nursery Production, Orchards & Plantations, Pastures, Vegetables"

305	Congeneric weed	y
	Source(s)	Notes
	Barney, J. N., & DiTommaso, A. (2003). The biology of Canadian weeds. 118. <i>Artemisia vulgaris</i> L. Canadian Journal of Plant Science, 83(1), 205-215	" <i>A. vulgaris</i> is considered a troublesome weed in nursery and urban landscapes in Canada and the Eastern United States (Henderson and Weller 1985), with the most serious infestations occurring in nursery stock, waste areas, and turfgrass. The US nursery industry considers <i>A. vulgaris</i> one of its 10 most serious weeds (Henderson and Weller 1985; Holm et al. 1997). <i>A. vulgaris</i> is found in most field-grown ornamental crops; i.e., trees, shrubs, herbaceous ornamentals, but is rarely found in containerized ornamentals in the Southeastern United States (J.C. Neal, personal communication). However, <i>A. vulgaris</i> is sold as a containerized ornamental at a garden centre in Victoria, BC (Feb. 2002) for \$7 per plant"

Qsn #	Question	Answer
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Artemisia absinthium - Weed of: Cereals, Grapevines, Nursery Production, Orchards & Plantations, Pastures, Vegetables" ... "Artemisia annua - Weed of: Cereals, Vegetables" ... "Artemisia arborescens - Weed of: Pastures" ... "Artemisia biennis - Weed of: Cereals, Nursery Production" ... "Artemisia campestris - Weed of: Pastures" ... "Artemisia capillaris - Weed of: Pastures" ... "Artemisia douglasiana - Weed of: Grapevines, Orchards & Plantations, Pastures, Pome Fruits" ... "Artemisia filifolia - Weed of: Pastures" ... "Artemisia frigida - Weed of: Vegetables" ... "Artemisia gmelinii - Weed of: Cereals" ... "Artemisia japonica - Weed of: Pastures" ... "Artemisia ludoviciana - Weed of: Cereals, Vegetables" ... "Artemisia maritima - Weed of: Cereals, Orchards & Plantations, Pome Fruits" ... "Artemisia nilagirica - Weed of: Orchards & Plantations" ... "Artemisia parviflora - Weed of: Orchards & Plantations" ... "Artemisia princeps - Weed of: Pastures" ... "Artemisia santonicum - Weed of: Pastures" ... "Artemisia scoparia - Weed of: Orchards & Plantations, Pastures" ... "Artemisia tournefortiana - Weed of: Orchards & Plantations" ... "Artemisia tridentate - Weed of: Cereals, Lupins, Pastures" ... "Artemisia verlotiorum - Weed of: Pastures" ... "Artemisia vestita - Weed of: Orchards & Plantations" ... "Artemisia vulgaris - Weed of: Cereals, Cutflowers, Grapevines, Nursery Production, Orchards & Plantations, Pastures, Vegetables"

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Wu, Z. Y., Raven, P. H. & Hong, D. Y., (eds.). 2011. Flora of China Volume 20-21 (Asteraceae). Science Press, Beijing & Missouri Botanical Garden Press, St. Louis	[No evidence] "Herbs, perennial, 60–150 cm tall, somewhat woody at base, gray sericeous or puberulent. Stems 1–3. Basal leaves: petiole 6–12 cm; leaf blade ovate-elliptic or ovate, 8–12 × 7–9 cm, 2- or 3-pinnatisect; segments 4 or 5 pairs, pinnately lobed; lobules lanceolate-elliptic or -linear, 8–15 × 2–4(–7) mm, apex obtuse. Middle stem leaves: petiole 2–6 cm; leaf blade ovate or elliptic-ovate, 2-pinnatisect; lobules linear-lanceolate, (8–)10–25 × 2–3(–5) mm. Uppermost leaves 4–6 × 2–4 cm, pinnatisect or 5-lobed; leaflike bracts 3-lobed or entire; lobes lanceolate or linear-lanceolate."

402	Allelopathic	
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	[Inconclusive] "There has been interest in possible allelopathic effects of absinth on other plants. Griimmer (1961) reviewed the literature on the subject with no firm conclusions being given except that absinth is capable of extracting large quantities of nitrogen from the soil and this could account for the apparent allelopathy reported by authors. Although growth inhibitors in extracts of absinth can be detected in petri dish tests, experiments in soils are less than convincing."

Qsn #	Question	Answer
403	Parasitic	n
	Source(s)	Notes
	Wu, Z. Y., Raven, P. H. & Hong, D. Y., (eds.). 2011. Flora of China Volume 20-21 (Asteraceae). Science Press, Beijing & Missouri Botanical Garden Press, St. Louis	"Herbs, perennial, 60–150 cm tall, somewhat woody at base, gray sericeous or puberulent." [Asteraceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Barney, J. N., & DiTommaso, A. (2003). The biology of Canadian weeds. 118. <i>Artemisia vulgaris</i> L. Canadian Journal of Plant Science, 83(1), 205-215	"Cattle will not graze absinth by choice but when the weed is in hay it may be consumed inadvertently."
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/al.html . [Accessed 25 Nov 2020]	"PALATABILITY : Absinthium is unpalatable to fairly palatable to cattle [15,28]. Palatability is listed as poor for horses and good for sheep [28]. NUTRITIONAL VALUE : Absinthium energy and protein values are listed as fair [28]."

405	Toxic to animals	
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Effects on animals unclear. Some references indicate plants may be palatable] "Toxic only if large quantities eaten, all parts poisonous."
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/al.html . [Accessed 25 Nov 2020]	[Palatable to some animals, with no mention of toxic effects] "Absinthium is unpalatable to fairly palatable to cattle [15,28]. Palatability is listed as poor for horses and good for sheep [28]. ... "Absinthium taints milk when eaten by cows [14]."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	"Over 285 species of insects were taken from <i>A. absinthium</i> in Saskatchewan in the period 1973-1982. Although the number is large and some species were abundant, especially some of the Diptera, the apparent effect on the plant is small." ... "Microorganisms and viruses - Although a number of pathogens have been listed for other <i>Artemisia</i> spp., few have been recorded from <i>A. absinthium</i> . The exceptions are: the powdery mildew, <i>Erysiphe cichoracearum</i> DC. ex Merat (Shaw 1972), the leaf spot, <i>Cercospora ferruginea</i> Fckl. and the leaf blight <i>C. olivacea</i> Otth. (U.S. Department of Agriculture 1960)."

407	Causes allergies or is otherwise toxic to humans	y
	Source(s)	Notes

Qsn #	Question	Answer
	Plants for a Future. (2020). <i>Artemisia absinthium</i> . https://pfaf.org . [Accessed 2 Dec 2020]	"The plant is poisonous if used in large quantities[20, 61]. Even small quantities have been known to cause nervous disorders, convulsions, insomnia etc [222]. Just the scent of the plant has been known to cause headaches and nervousness in some people[169]. The plant contains thujone. In small quantities this acts as a brain stimulant but is toxic in excess[254]. Avoid if prone to seizures. Avoid during pregnancy & breast feeding. Absinthism adverse effects include hallucinations, insomnia, loss of intellect, psychosis, tremor & seizures [301]"
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Toxic only if large quantities eaten, all parts poisonous."
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	[Possible allergen] "The presence of absinth in stored grain is also minimal. The odour of absinth has been known to cause illness in persons working in infested fields (Coupland et al. 1956) and pollen causes sensitized people great discomfort."

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/a1.html . [Accessed 2 Dec 2020]	[Burns in fires. Contribution to fuel load and fire risk unclear] "Low-severity fire readily top-kills absinthium and may completely kill some plants. Because absinthium perennating buds are at or near the soil surface, they are susceptible to fire [21]."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	"Absinth is tolerant of shade and does well in gardens surrounded by shelter belts and was reported by Selleck and Coupland (1961) to be growing vigorously within a plantation of trees providing a 60% crown cover."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	"Absinth can be found on a variety of soil types but in Saskatchewan it is predominately on the Dark Brown Chernozemic soils with textures ranging from loams to clay loams. Although it can thrive on heavy clays, absinth appears not to be a problem on these soils. In the northern agricultural areas, absinth occurs on the Black Chernozemic soils with moderate textures and in Manitoba absinth is predominately on Black soils. Absinth is often found in borrow pits and gravel piles from which it is spread in the course of road construction. Absinth may be killed by surface salt accumulations even though moisture may be abundant (Selleck and Coupland 1961)."

Qsn #	Question	Answer
411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Wu, Z. Y., Raven, P. H. & Hong, D. Y., (eds.). 2011. Flora of China Volume 20-21 (Asteraceae). Science Press, Beijing & Missouri Botanical Garden Press, St. Louis	"Herbs, perennial, 60–150 cm tall, somewhat woody at base, gray sericeous or puberulent."

412	Forms dense thickets	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"Generally, the weed is found along the edges of fields but occasionally it can become very dense and may invade a pasture in a relatively short time (Mitich 1975)."

501	Aquatic	n
	Source(s)	Notes
	Wu, Z. Y., Raven, P. H. & Hong, D. Y., (eds.). 2011. Flora of China Volume 20-21 (Asteraceae). Science Press, Beijing & Missouri Botanical Garden Press, St. Louis	[Terrestrial] "Herbs, perennial, 60–150 cm tall, somewhat woody at base, gray sericeous or puberulent." ... "Hillsides, steppes, scrub, forest margins, often in locally moist situations; 1100–1500 m."

502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 25 Nov 2020]	Family: Asteraceae Subfamily: Asteroideae Tribe: Anthemideae Subtribe: Artemisiinae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 25 Nov 2020]	Family: Asteraceae Subfamily: Asteroideae Tribe: Anthemideae Subtribe: Artemisiinae

Qsn #	Question	Answer
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	"The extensive root and crown, containing abundant food reserves, overwinters and produces new shoots in the spring."
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/a1.html . [Accessed 25 Nov 2020]	"The well-developed root system consists of a taproot occasionally reaching 2 inches (5 cm) in diameter with shallow lateral branches extending 6 feet in all directions [18]. Absinth wormwood may be weakly rhizomatous [14,27]."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	[No evidence] " <i>Artemisia absinthium</i> is a frequent plant of waste places throughout the British Isles north to Aberdeen, Ross and Orkney. It is found over most of Europe and temperate Asia northwards to Lapland, Karelia and southern Siberia. It is an introduction in North and South America and New Zealand (Clapham et al. 1962). The weed has become naturalized in every province from Newfoundland to British Columbia north to Moosinee and the Peace River district (Scoggan 1978) (Fig. 2). It is found across the northern United States and occasionally as far south as North Carolina in the east (Mitich 1975; Fernald 1950)."

602	Produces viable seed	y
	Source(s)	Notes
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/a1.html . [Accessed 25 Nov 2020]	" <i>Absinthium</i> reproduces primarily by seed and is a prolific seed producer [15,18,24]. Although the small seeds do not have any specific morphological provision for dispersal, they are easily scattered in hay and by wind, water, and animals."
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	"Seed production and dispersal - The natural spread of absinth occurs entirely from seeds. Seven samples of seeds collected in 1976 -1982 from Davin, Saskatchewan, contained a mean of 11 530, range 9100-15 440, seeds per gram."

603	Hybridizes naturally	n
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. Canadian Journal of Plant Science, 65(2), 389-400	"No naturally occurring hybrids have been reported."

604	Self-compatible or apomictic	

Qsn #	Question	Answer
	Source(s)	Notes
	Hobbs, C. R., & Baldwin, B. G. (2013). Asian origin and upslope migration of Hawaiian Artemisia (Compositae–Anthemideae). <i>Journal of Biogeography</i> , 40 (3), 442-454	[Unknown for Artemisia absinthium] "Data on the mating system of Hawaiian Artemisia may allow for more insight into initial colonization of the islands, especially in light of documentation of both self-incompatibility and self-compatibility in the genus (e.g. Ferreira et al., 1997; Penas et al., 2011)."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. <i>Canadian Journal of Plant Science</i> , 65(2), 389-400	"The flowers are borne in leafy panicles and appear in July. They are wind pollinated, shedding large quantities of dry light pollen which is blown long distances by the wind."

606	Reproduction by vegetative fragmentation	
	Source(s)	Notes
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/a1.html . [Accessed 1 Dec 2020]	"Maw and others [15] and Staniforth and Scott [20] did not find any evidence of vegetative reproduction by absinthium. However, Selleck and Coupland [18] suggested that absinthium may regenerate from shallow lateral root branches when plowed. Welsh and others [27] reported that absinthium has a rhizomatous caudex, and Lym and others [14] stated that absinthium may spread by rootstock."
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. <i>Canadian Journal of Plant Science</i> , 65(2), 389-400	"The natural spread of absinth occurs entirely from seeds. Seven samples of seeds collected in 1976-1982 from Davin, Saskatchewan, contained a mean of 11 530, range 9100-15 440, seeds per gram." [But see Carey (1994)]

607	Minimum generative time (years)	2
	Source(s)	Notes
	Bender, M., Baskin, J., & Baskin, C. (2000). Age of Maturity and Life Span in Herbaceous, Polycarpic Perennials. <i>Botanical Review</i> , 66(3), 311-349	"Table IV Herbaceous, polycarpic perennials with earliest maturity in the wild being in the second year; ramets common" [Includes <i>Artemisia absinthium</i>]
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium</i> L. <i>Canadian Journal of Plant Science</i> , 65(2), 389-400	[Rosette in first year. Flowering in second year] "Absinth also overwinters as seed in the soil and as rosettes of yearling plants." ... "Seedlings emerge from early spring to autumn, whenever sufficient moisture and heat are available, and form rosettes by the end of the first season. Growth from established plants resumes in early spring with the new growth reaching 2.5-5.0 cm by 1 May and 20-30 cm by 1 June. One or more flower stalks may be produced by mid-July and seeds mature in late August (Selleck and Coupland 1961)."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes

Qsn #	Question	Answer
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"Although absinth is occasionally found in alfalfa and pastures, it is most noticeable as solid stands along fencerows and roadsides." [Possibly. No means of attachment, but presence along roads suggests dispersal may be facilitated by people]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"It is an introduction in North and South America and New Zealand (Clapham et al. 1962)."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Cultivated in Hawaii] "Native to northern Africa and the temperate portions of Europe and Asia, wormwood has since antiquity been used medicinally and as the source of a strong liqueur."

703	Propagules likely to disperse as a produce contaminant	
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	[Not specifically identified as a produce contaminant, but its presence around fields and croplands suggests seed contamination is a possibility] "It is a weed of roadsides, waste places, farmyards, gardens, and shelter-belts and although found in every province and the northern United States, it is particularly prevalent in the prairie provinces and the northern great plains states. It can be controlled by cultivation but is capable of invading overgrazed pastures, hay fields and croplands that are periodically disturbed. It is generally a poor competitor and can be controlled by grass competition and by herbicides."

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	[Dispersed by wind when plants break off] "There is no provision for transport by animals or wind although seeds can be spread long distances when plants become broken off and blown about."

705	Propagules water dispersed	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"The seeds float easily and can be carried by water. Moist areas along water courses provide ideal sites for germination."

Qsn #	Question	Answer
706	Propagules bird dispersed	n
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"There is no provision for transport by animals or wind although seeds can be spread long distances when plants become broken off and blown about. The seeds float easily and can be carried by water. Moist areas along water courses provide ideal sites for germination."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	[No evidence] "There is no provision for transport by animals or wind although seeds can be spread long distances when plants become broken off and blown about. The seeds float easily and can be carried by water. Moist areas along water courses provide ideal sites for germination."

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"There is no provision for transport by animals or wind although seeds can be spread long distances when plants become broken off and blown about. The seeds float easily and can be carried by water."

801	Prolific seed production (>1000/m2)	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"Also seeds of absinth retained their viability for 3-4 yr. At Regina, Saskatchewan, seeds shed on a cultivated heavy clay soil germinated and produced seedlings 4 yr later. The percentage of seeds germinating in the spring is high. Seedlings in the one leaf stage were found in a moist ditch bottom at the Davin site in May at a density of 87 456 per m2"

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"Absinth also overwinters as seed in the soil and as rosettes of yearling plants." ... "Also seeds of absinth retained their viability for 3 -4 yr. At Regina, Saskatchewan, seeds shed on a cultivated heavy clay soil germinated and produced seedlings 4 yr later. The percentage of seeds germinating in the spring is high."

803	Well controlled by herbicides	y
	Source(s)	Notes

Qsn #	Question	Answer
	Maw, M. G., Thomas, A. G., & Stahevitch, A. (1985). The Biology of Canadian Weeds: 66. <i>Artemisia absinthium L.</i> Canadian Journal of Plant Science, 65(2), 389-400	"Absinth can be controlled by herbicides. Selleck (1959) found that one application of 2,4-D ester at a rate of 1. 7 kg/ha in each of two consecutive years (in early fall and again in spring) provided complete control in pasture. Two applications in one year followed by a third application the following year was slightly more effective than the one application in each of two years. Heavier applications of herbicides are necessary where there is no competition from grasses. Spraying in early to mid-May gives the best results but late May spraying may be effective when the season is late and the weed growth is delayed. Spraying pastures with 2,4-D ester without follow up late in the season with the same chemical, such as in mid-June or after flowers begin to form, gives unsatisfactory control even at rates such as 4.5 kg/ha (Wrage and Kinch 1979). Spring application of dicamba at 0. 57 kg/ ha when the absinth is 10-20 cm tall and for small patches, treatment with soil sterilants containing borates, chlorates or monuron, and picloram at 2.24 kg/ha have been advocated for the control of absinth (Leavitt 1974)."
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/al.html . [Accessed 25 Nov 2020]	" <i>Absinthium</i> is considered a weed in pastureland, cropland, and rangeland in the northern Great Plains [14,15]. Although it spreads rapidly on disturbed sites, it is easily controlled by herbicides and/or vigorous competition from grasses [14]. Picloram provides the most rapid and complete control of <i>absinthium</i> , but dicamba, 2,4-D, and glyphosate are also effective. Application techniques are described [14,15]."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	n
	Source(s)	Notes
	Carey, J. H. (1994). <i>Artemisia absinthium</i> . In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/artabs/al.html . [Accessed 1 Dec 2020]	"Low-severity fire readily top-kills <i>absinthium</i> and may completely kill some plants. Because <i>absinthium</i> perennating buds are at or near the soil surface, they are susceptible to fire [21]." ... "PLANT RESPONSE TO FIRE : <i>Absinthium</i> perennating buds will sprout if they survive fire. Annual early spring prescribed fires were conducted in a South Dakota prairie infested with <i>absinthium</i> . Dormant fine fuels ranged from 2,000 to 2,400 kilograms per hectare. Nearly two-thirds of the <i>absinth</i> wormwood survived the first fire and regrew, but four consecutive annual spring fires reduced <i>absinthium</i> by 96 percent [21]."
	DiTomaso, J.M. and Johnson, D.W. (eds.). (2006). The Use of Fire as a Tool for Controlling Invasive Plants. Cal-IPC Publication 2006-01. California Invasive Plant Council, Berkeley, CA	"Typically, controlled fires or wildfires promote invasive perennial forbs. As an exception, repeated spring burning in a mixed grass prairie in South Dakota reduced the invasive Mediterranean native <i>absinth</i> wormwood (<i>Artemisia absinthium</i>) by 96% (Steuter 1988)."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad climate suitability
- Able to grow and spread in regions with tropical climates
- Widely naturalized (although no evidence in the Hawaiian Islands to date)
- A disturbance weed that can negatively impact agriculture
- Other species are invasive
- Allergenic to people, and toxic if consumed in large quantities
- Shade tolerant
- Tolerates many soil types
- Forms dense stands in disturbed habitats or overgrazed pastures
- Reproduces by seeds
- Reaches maturity in 2 growing seasons
- Dispersed by wind, water and intentionally by people
- Prolific seed production
- Seeds can remain viable in the soil for up to 4 years

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Palatable to some grazing animals (despite reports of possible toxicity)
- Herbicides may provide effective control
- Killed by fire