

Taxon: <i>Ambrosia psilostachya</i> DC.	Family: Asteraceae
Common Name(s): Cuman ragweed perennial ragweed Roman wormwood western ragweed	Synonym(s): <i>Ambrosia coronopifolia</i> Torr. & A.

Assessor: No Assessor	Status: Assessor Approved	End Date: 4 May 2018
WRA Score: 16.0	Designation: H(HPWRA)	Rating: High Risk

Keywords: Perennial Herb, Crop Weed, Allelopathic, Rhizomatous, Contaminant

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	y=1, n=0	y
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals		
406	Host for recognized pests and pathogens	y=1, n=0	y
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
408	Creates a fire hazard in natural ecosystems	y=1, n=0	y

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	y
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		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	2
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	n
705	Propagules water dispersed	y=1, n=-1	n
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	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	[Used medicinally, but not domesticated] "Cuman ragweed was used for medicinal purposes by American Indians. Pueblo women in New Mexico drank a tea made from Cuman ragweed during difficult labors at childbirth, and the Cheyenne of the Central Plains used it to treat intestinal problems and colds [12]. Kiowa of Oklahoma rubbed a preparation of Cuman ragweed on the sores of humans and horses [12]."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2018. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2018. 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
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed's range extends from southern British Columbia east to Nova Scotia [51,81,107] and southward through the United States from the Appalachians to the West Coast and into central Mexico [38,74,90,104,108]. Cuman ragweed was introduced from North America into Europe and southwestern Russia [115]."

202	Quality of climate match data	High
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes

Qsn #	Question	Answer
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Climate ranges from continental to coastal with short, warm to hot summers and long, cold winters [1,3,16,129]. Often, there are moderately strong surface winds [1]. Humidity is semiarid to moist subhumid [42,44,86]. Annual precipitation ranges from 5 to 34 inches (114-880 mm) with 60 to 80 percent occurring during the growing season [19,23,39,56,75,114,125]. Temperatures vary from an average 72 degrees Fahrenheit (22 deg C) in July to a January average of 11 degrees Fahrenheit (-11.5 deg C) [124]. Cuman ragweed grows at elevations ranging from 850 to 7,400 feet (259-2,256 m) and in many types of soils [18,30,60,66,69]. Soil textures are predominantly loams, varying from silty clay loams to fine sandy loams [23,61,122]. Soil pH ranges from 5.7 to 7.9 [22,105]. Soils often have little organic matter and are low in fertility [34]."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 4 May 2018]	"Naturalized Africa NORTHERN AFRICA: Algeria SOUTHERN AFRICA: South Africa Asia-Temperate EASTERN ASIA: Taiwan Australasia AUSTRALIA: Australia [New South Wales, Queensland (s.e.), South Australia (s.e.), Victoria] Europe NORTHERN EUROPE: Sweden, United Kingdom MIDDLE EUROPE: Belgium, Germany, Netherlands, Poland, Switzerland EASTERN EUROPE: Russian Federation-European part, [European part] Ukraine SOUTHEASTERN EUROPE: Italy, Montenegro, Romania SOUTHWESTERN EUROPE: France, Spain Pacific SOUTHWESTERN PACIFIC: New Caledonia Southern America BRAZIL: Brazil [Parana, Rio Grande do Sul, Sao Paulo]"
	Yen-Hsueh Tseng & Ching-I Peng. 2004. <i>Ambrosia psilostachya</i> DC. (Asteraceae) a Newly Naturalized Plant in Taiwan. <i>Unique Biological Research</i> 6(1): 71-74	"This paper describes <i>Ambrosia psilostachya</i> DC. (Asteraceae) as a plant newly recorded to Taiwan. It has established its feral population in Kaohsiung County, and is closely related to exotic <i>A. artemisiaefolia</i> L. of Taiwan. However, the two species are distinguishable by the structure of their pinnatifid leaves. This paper also provides its distribution, living habitat, breeding (flowering and fruiting) period."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes

Qsn #	Question	Answer
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed was introduced from North America into Europe and southwestern Russia [115]."
	AgroAtlas. 2018. Weeds - <i>Ambrosia psilostachya</i> . http://www.agroatlas.ru/en/content/weeds/Ambrosia_psilostachya/ . [Accessed 4 May 2018]	"The plant originates in North America. The general distribution includes North America (Canada, the USA, and Mexico), Europe (Belgium, Hungary, Germany, Denmark, Poland, Holland, Spain, France, and Sweden), and Australia. On the territory of the former USSR it is now distributed in the European part of the Russian Federation and in Central Asia (Kazakhstan). In the Russian Federation the centers of weed are located in 5 areas, i.e., Volgograd (60 hectares), Orenburg (114 hectares) and Samara (153 hectares) Regions, Stavropol Territory (210 hectares) and Bashkortostan (622 hectares)."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"has become a serious weed in parts of eastern Europe and western Asia. It also occurs in South America, Japan, Mauritius and Australia."
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 4 May 2018]	"Naturalized Africa NORTHERN AFRICA: Algeria SOUTHERN AFRICA: South Africa Asia-Temperate EASTERN ASIA: Taiwan Australasia AUSTRALIA: Australia [New South Wales, Queensland (s.e.), South Australia (s.e.), Victoria] Europe NORTHERN EUROPE: Sweden, United Kingdom MIDDLE EUROPE: Belgium, Germany, Netherlands, Poland, Switzerland EASTERN EUROPE: Russian Federation-European part, [European part] Ukraine SOUTHEASTERN EUROPE: Italy, Montenegro, Romania SOUTHWESTERN EUROPE: France, Spain Pacific SOUTHWESTERN PACIFIC: New Caledonia Southern America BRAZIL: Brazil [Parana, Rio Grande do Sul, Sao Paulo]"
	Wagner, W.L., Herbst, D.R. & Lorence, D.H. 2018. <i>Flora of the Hawaiian Islands</i> . Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed 4 May 2018]	No evidence to date

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed is a major invader of deteriorating rangeland. It readily moves into open habitat in prairies [19,121]."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"usually found as a weed along roadsides, in uncultivated fields, vacant lots and waste places."

303	Agricultural/forestry/horticultural weed	y
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	" <i>Ambrosia psilostachya</i> ... Weed of: Grapevines, Orchards & Plantations, Pastures, Pome Fruits, Vegetables"
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Perennial ragweed is a strongly competitive plant, often growing densely to the detriment of crop and pasture...It is not palatable to stock, dense infestations thus reducing pasture productivity considerably."
	AgroAtlas. 2018. Weeds - <i>Ambrosia psilostachya</i> . http://www.agroatlas.ru/en/content/weeds/Ambrosia_psilostachya/ . [Accessed 4 May 2018]	"Perennial Ragweed is one of the most difficultly eradicable weeds, being included in lists of quarantine weeds in many countries. Weed is noxious. It causes reduced productivity of cultures; quality of crop (and forages) also decreases, and efficiency of pastures weakens. The weed is not edible for cattle. Its pollen is an allergen, causing pollinosis. Control measures includes regular destroying of the weed rhizomes with the help of appropriate types of soil treatment and herbicides; avoiding contamination of sowing material or ground by seeds; mowing-off or pulling-up the weed before fructification."

304	Environmental weed	n
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed is a major invader of deteriorating rangeland. It readily moves into open habitat in prairies [19,121]."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"usually found as a weed along roadsides, in uncultivated fields, vacant lots and waste places." [mostly a disturbance weed with negative impacts to agriculture]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Grapevines, Orchards & Plantations, Pastures, Pome Fruits, Vegetables"

305	Congeneric weed	y
	Source(s)	Notes

Qsn #	Question	Answer
	<p>AgroAtlas. 2018. Weeds - Ambrosia artemisiifolia. http://www.agroatlas.ru/en/content/weeds/Ambrosia_artemisiifolia/. [Accessed 4 May 2018]</p>	<p>"A. artemisiifolia is a quarantine weed, litters practically all field crops; it is especially harmful in vegetable and tilled crops. Having powerful root system, the weed strongly dries up and impoverishes soil. Animals eating Ambrosia produce milk and dairy products with unpleasant smack and smell. Pollen is dangerous to human health, causing sharp forms of pollinosis (autumn hay fever). Control measures include quarantine actions, i.e., prevention of Ambrosia import with grain from quarantine zones to areas free of the weed, regular inspection of agricultural lands, full cleaning of sowing material; land treatment, i.e., stubble shelling with subsequent plowing and surface soil treatment, on tilling crops - pre-emergence harrowing before formation of two pairs of Ambrosia true leaves, and repeated interrow treatments during a vegetative period, repeated mowing before fructification of the weed on nearby sites, correct alternation of cultures in a crop rotation, manual weeding, black fallow; chemical method (herbicides); biological method (<i>Lygogramma suturalis</i>, <i>Tarachidia candefacta</i>, planting perennial cereal grasses for two-three years, treatments with the biological products containing pathogens causing Ambrosia diseases, for example, White Rust."</p>
	<p>Weber, E. 2017. Invasive Plant Species of the World, 2nd Edition: A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK</p>	<p>"Ambrosia artemisiifolia ... Although annual ragweed is mainly confined to disturbed sites and crop fields, it threatens near-natural grasslands in Hungary that are subject to natural disturbances, and conservation areas aiming at protecting rare segetal species ... Spread of annual ragweed may interfere with restoration programmes for re-establishing native grasslands ... The overall impact is a strong reduction in plant species richness, likely coupled with a decline in invertebrate species richness."</p>

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	<p>Flora of North America Editorial Committee. 2006. Flora of North America North of Mexico. Vol. 21. New York and Oxford</p>	<p>[No evidence] "Perennials, 10–60(–100+) cm. Stems erect. Leaves proximally opposite, distally alternate; petioles 0–25 mm (often ± winged); blades deltate to lanceolate, 20–60(–140) × 8–35(–50+) mm, pinnately toothed to 1-pinnately lobed, bases cuneate to truncate, ultimate margins entire or toothed, abaxial and adaxial faces hirsutulous to strigose and gland-dotted."</p>

402	Allelopathic	y
	Source(s)	Notes

Qsn #	Question	Answer
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed may have allelopathic or other inhibitory effects on other pioneer species. Leachate from Cuman ragweed leaves and roots significantly ($P < 0.05$) reduced growth of soil bluegreen bacteria (<i>Lyngby</i> spp.) cultures [102]. While soil collected in July near western ragweed was stimulatory to pioneer weedy species (for example, Japanese brome [<i>Bromus japonicus</i>]), soil collected in January had an inhibitory or no effect on seedlings of the same species [102]. Leaf leachate from leaves that overwintered on Cuman ragweed plants inhibited germination, seedling topgrowth, and mature plant root formation of the pioneer species [102]." ... "Cuman ragweed root exudate significantly inhibited the formation of nodules on legume roots, which decreases their ability to fix nitrogen [128]."
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"Extracts from aerial growth are allelopathic, inhibiting germination and early seedling growth of several plant species."

403	Parasitic	n
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed is a warm-season, native perennial forb." [Asteraceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"It is not palatable to stock, dense infestations thus reducing pasture productivity considerably."
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	[Palatable to some animals & at certain growth stages] "Managers rate the forage value of Cuman ragweed as fair [121]. The foliage and stems contain cinnamic acid and sesquiterpene lactones that deter herbivory [129]. However, Cuman ragweed is not considered a poisonous plant [88]. It is moderately important as ungulate forage [24,31,48,98,103]." ... "Ragweeds are normally considered to be unpalatable but when treated with 2,4-D become palatable. Treated plants may, however, accumulate nitrates to a toxic level [76]. In Montana, Utah, and Wyoming, western ragweed palatability is poor for ungulates and waterfowl. Its palatability has mixed ratings for the following species:"

405	Toxic to animals	
	Source(s)	Notes

Qsn #	Question	Answer
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	[May become toxic if treated with herbicides] "The foliage and stems contain cinnamic acid and sesquiterpene lactones that deter herbivory [129]. However, Cuman ragweed is not considered a poisonous plant [88]. It is moderately important as ungulate forage [24,31,48,98,103]." ... "Ragweeds are normally considered to be unpalatable but when treated with 2,4-D become palatable. Treated plants may, however, accumulate nitrates to a toxic level [76]."

406	Host for recognized pests and pathogens	y
	Source(s)	Notes
	Black, M. C., Kamas, J. S., Sánchez, A. M., & Davis, J. L. (2004). Supplemental plant hosts for <i>Xylella fastidiosa</i> near four Texas hill country vineyards. 2004 Research Symposium Proceedings. http://www.piercesdisease.org/ . [Accessed]	"Pierce's disease (PD), caused by the bacterial pathogen <i>Xylella fastidiosa</i> , is the greatest limiting factor for growing <i>Vitis vinifera</i> in most of Texas. Associations of <i>X. fastidiosa</i> , known vector glassy wing sharpshooter <i>Homalodisca coagulata</i> , other xylophagous insects, and numerous host plant species in warmer climates of Texas are apparently ancient and complex. Widespread death of European grape plants has been a common occurrence in much of Texas, perhaps since the first of many plant introductions 400 years ago. There are numerous scientific advantages to studying a biological system where pathogen, vectors, and host plants are native and endemic. However, little is known about the diversity of plants and the bacterium, or potential biocontrol agents in warmer regions of Texas." ... "Table 3. Five weed species in Asteraceae collected near four vineyards and positive for <i>Xylella fastidiosa</i> with serology and dilution plating in summer and fall 2003." [Includes <i>Ambrosia psilostachya</i>]

407	Causes allergies or is otherwise toxic to humans	y
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"The outstanding feature of perennial ragweed, however, is the allergic inflammation of the nose suffered by many people because of its pollen. The illness is so debilitating that some areas of the United States, Oregon for example, have instituted eradication programmes on ragweed so that they can advertise as being 'ragweed free' to attract tourists."

Qsn #	Question	Answer
408	Creates a fire hazard in natural ecosystems	y
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"As a component of North American grasslands, Cuman ragweed has evolved with fire. Soil can insulate roots from lethal temperatures during a fire. Surface rhizomes of Cuman ragweed may be killed during a fire; however, the plant also has deep-seated rhizomes which would survive most fires [6]." ... "Cuman ragweed has been classified as an increaser (by 100 percent or more) on burned plots [77]."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Perennial ragweed is a strongly competitive plant, often growing densely to the detriment of crop and pasture." [dense cover and fire adaptation would likely increase fire hazard]

Qsn #	Question	Answer
409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Lady Bird Johnson Wildflower Center. 2018. <i>Ambrosia psilostachya</i> . https://www.wildflower.org/plants/result.php?id_plant=AMPS . [Accessed 4 May 2018]	"Light Requirement: Sun , Part Shade"
	Montagnani, C., Gentili, R., Smith, M., Guarino, M. F., & Citterio, S. (2017). The Worldwide Spread, Success, and Impact of Ragweed (<i>Ambrosia</i> spp.). <i>Critical Reviews in Plant Sciences</i> , 36(3), 139-178	"Table 3. Environmental requirements of <i>Ambrosia</i> species (ragweeds): main data related to colonized habitat types (native and invasive range), suitable climatic, soil, and light conditions." [Ambrosia psilostachya - Shady-tolerant]
	Hilty, J. 2017. Prairie Wildflowers of Illinois - <i>Ambrosia psilostachya</i> (Western Ragweed). http://www.illinoiswildflowers.info . [Accessed 4 May 2018]	"The preference is full sun, mesic to dry conditions, and poor soil."

Qsn #	Question	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed grows at elevations ranging from 850 to 7,400 feet (259-2,256 m) and in many types of soils [18,30,60,66,69]. Soil textures are predominantly loams, varying from silty clay loams to fine sandy loams [23,61,122]. Soil pH ranges from 5.7 to 7.9 [22,105]. Soils often have little organic matter and are low in fertility [34]."
	CABI. 2018. Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Soil reaction acid alkaline neutral Soil texture heavy light medium Special soil tolerances infertile saline shallow sodic"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed is a warm-season, native perennial forb. The main stem rises from shallow (2 inches [5 cm]) or deep, branching rhizomes which extend down 3 to 6 feet (0.9-1.8 m) [6,70]. Stems are slender and branched, usually 1 to 2 feet (30-60 cm) tall [59,70]. Plants are monoecious with unisexual flowers; male flowers occur at the top of the plant and female flowers are axillary [41]. Achenes have a short beak and small blunt tubercles on top [41]."

412	Forms dense thickets	y
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Perennial ragweed is a strongly competitive plant, often growing densely to the detriment of crop and pasture."

Qsn #	Question	Answer
501	Aquatic	n
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed grows in grasslands, savannas, and woodlands across North America. In addition to occurring in its native settings (such as dry prairies, blowouts, washouts, sandy woods, meadows, and hills), Cuman ragweed is a widespread weed in waste places, roadsides, railroads, overgrazed rangeland, and other disturbed places [41,75,99,107,126]."
	DiTomaso, J. 2007. Weeds of California and Other Western States, Volume 1. UCANR Publications, Oakland, CA	Terrestrial

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 4 May 2018]	Asteraceae (alt.Compositae)

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 4 May 2018]	Asteraceae (alt.Compositae)

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"POSTFIRE REGENERATION STRATEGY : Geophyte, growing points deep in soil Rhizomatous herb, rhizome in soil"

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	[No evidence] "Cuman ragweed grows in grasslands, savannas, and woodlands across North America. In addition to occurring in its native settings (such as dry prairies, blowouts, washouts, sandy woods, meadows, and hills), Cuman ragweed is a widespread weed in waste places, roadsides, railroads, overgrazed rangeland, and other disturbed places [41,75,99,107,126]."
	DiTomaso, J. 2007. Weeds of California and Other Western States, Volume 1. UCANR Publications, Oakland, CA	No evidence

Qsn #	Question	Answer
602	Produces viable seed	y
	Source(s)	Notes
	DiTomaso, J. 2007. Weeds of California and Other Western States, Volume 1. UCANR Publications, Oakland, CA	"reproducing by seed and vegetatively from a strong rootstock and creeping roots."
	Montagnani, C., Gentili, R., Smith, M., Guarino, M. F., & Citterio, S. (2017). The Worldwide Spread, Success, and Impact of Ragweed (<i>Ambrosia</i> spp.). <i>Critical Reviews in Plant Sciences</i> , 36(3), 139-178	"the reproduction strategy of <i>A. psilostachya</i> is mainly vegetative and the amount of seeds produced is quite small."

603	Hybridizes naturally	
	Source(s)	Notes
	Montagnani, C., Gentili, R., Smith, M., Guarino, M. F., & Citterio, S. (2017). The Worldwide Spread, Success, and Impact of Ragweed (<i>Ambrosia</i> spp.). <i>Critical Reviews in Plant Sciences</i> , 36(3), 139-178	[Possibly?] "Furthermore, the taxonomy is complicated by the possible presence of hybrids between <i>A. artemisiifolia</i> and <i>A. psilostachya</i> (<i>A. x intergradiens</i> ; Wagner and Beals, 1958) and <i>A. artemisiifolia</i> and <i>A. trifida</i> (<i>Ambrosia x helenae</i> ; Wagner, 1958; Strother, 2006)."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Friedman, J., & Barrett, S. C. (2008). High outcrossing in the annual colonizing species <i>Ambrosia artemisiifolia</i> (Asteraceae). <i>Annals of Botany</i> , 101(9), 1303-1309	"Observations of pollen-tube growth and seed set following controlled pollinations demonstrated that plants of <i>A. artemisiifolia</i> possess a strong self-incompatibility mechanism, contrary to earlier reports and assumptions." [related species self-incompatible]

605	Requires specialist pollinators	n
	Source(s)	Notes
	CABI. 2018. Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	" <i>A. psilostachya</i> is primarily anemophilous (wind-pollinated). It does shed large quantities of air borne pollen that causes hay fever symptoms (Wodehouse, 1971; Bassett and Crompton, 1975)."
	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.	"They are wind-pollinated, the pollen of all species being highly allergenic."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Montagnani, C., Gentili, R., Smith, M., Guarino, M. F., & Citterio, S. (2017). The Worldwide Spread, Success, and Impact of Ragweed (<i>Ambrosia</i> spp.). <i>Critical Reviews in Plant Sciences</i> , 36(3), 139-178	"As already underlined, the life strategy of <i>A. psilostachya</i> is mainly based on its below-ground system which allows it to overcome adverse moments and unpredictability deriving from human action or climate: through the rhizome, <i>A. psilostachya</i> can form clones of plants occupying areas larger than 100 m ² (Karnkowski, 2001). In suitable situations, the presence of the weed can be very massive: 1132 kg ha ⁻¹ dry weight according to Bovey et al. (1966)."

Qsn #	Question	Answer
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Cuman ragweed colonizes sites by means of spreading rhizomes in the surface 2 inches (5 cm) of soil, allowing it to propagate when conditions are unfavorable to seedling establishment [6,48,127]."
	CABI. 2018. Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Through its spreading rootstocks, an area can be readily colonized by one or a few original plants despite the small seed set. The reproductive strategy appears similar in all habitats. In the first year, the individual plant does not appear to produce additional shoots from its root system. In the second year, new shoots emerge from the creeping rootstocks thus establishing a clone which can cover about 2 m ² (Wagner and Beals, 1958)."
	DiTomaso, J. 2007. Weeds of California and Other Western States, Volume 1. UCANR Publications, Oakland, CA	"Unlike annual bursage and giant ragweed, western ragweed can reproduce vegetatively from creeping roots"

607	Minimum generative time (years)	2
	Source(s)	Notes
	Black, A. & Sparks, J. 2007. Ragweeds The Good, The Bad and The Ugly (<i>Ambrosia</i> spp.). http://honeycreekfriends.org/plantofweek/ragweed.html . [Accessed 4 May 2018]	"During the first growing season, seedlings will not flower or produce additional shoots. However, in the second year, additional shoots will develop from rhizomes and form a colony."
	CABI. 2018. Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"The reproductive strategy appears similar in all habitats. In the first year, the individual plant does not appear to produce additional shoots from its root system. In the second year, new shoots emerge from the creeping rootstocks thus establishing a clone which can cover about 2 m ² (Wagner and Beals, 1958)."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Spread also occurs when the seeds, in mud, stick to animals, farm machinery and vehicles of all kinds. It is also commonly spread when contaminated soil and gravel are moved during road grading and roadmaking, and when such soil is used as garden topdressing."

702	Propagules dispersed intentionally by people	n
	Source(s)	Notes
	CABI. 2018. Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Intentional introduction - It is unlikely to have been intentionally introduced."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Spread also occurs when the seeds, in mud, stick to animals, farm machinery and vehicles of all kinds. It is also commonly spread when contaminated soil and gravel are moved during road grading and roadmaking, and when such soil is used as garden topdressing."

703	Propagules likely to disperse as a produce contaminant	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Georgia, A. E. 1919. A Manual of Weeds: With Descriptions of All the Most Pernicious and Troublesome Plants in the United States and Canada, Their Habits of Growth and Distribution, with Methods of Control. The MacMillian Company, New York	"brown achene-like fruits obovoid, hairy, short-pointed, with fewer tubercles than the preceding species or sometimes none at all; they are often found in grass and clover seed and in baled hay."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Contaminant, Herbal, Ornamental Dispersed by: Humans, Animals, Livestock, Vehicles, Escapee"
	CABI. 2018. Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"The further movement of <i>A. psilostachya</i> to new regions is possible as a seed contaminant in cereal grain. Through its spreading rootstocks, an area can be quickly colonized by one or a few original plants, despite low seed production, and control is not easy. <i>A. psilostachya</i> is highly competitive and will invade crops and pastures. Negative impacts include: crop losses, decrease in fodder availability, reduction in the local flora and increased human allergic reactions."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	[No evidence] "Perennial ragweed spreads widely because the fruit is well adapted to tangle in wool and stick to furred animals, clothing, bags and other fibrous materials. Spread also occurs when the seeds, in mud, stick to animals, farm machinery and vehicles of all kinds. It is also commonly spread when contaminated soil and gravel are moved during road grading and roadmaking, and when such soil is used as garden topdressing. Local spread and an increase in density occurs with the production of shoots from buds along the creeping roots."

705	Propagules water dispersed	n
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	[No evidence] "Perennial ragweed spreads widely because the fruit is well adapted to tangle in wool and stick to furred animals, clothing, bags and other fibrous materials. Spread also occurs when the seeds, in mud, stick to animals, farm machinery and vehicles of all kinds. It is also commonly spread when contaminated soil and gravel are moved during road grading and roadmaking, and when such soil is used as garden topdressing. Local spread and an increase in density occurs with the production of shoots from buds along the creeping roots."

706	Propagules bird dispersed	n
	Source(s)	Notes

Qsn #	Question	Answer
	Hilty, J. 2017. Prairie Wildflowers of Illinois - <i>Ambrosia psilostachya</i> (Western Ragweed). http://www.illinoiswildflowers.info . [Accessed 4 May 2018]	[Birds act as seed predators] "Like Common Ragweed (), the seeds of Western Ragweed are a popular source of food for many kinds of granivorous songbirds and upland gamebirds (see Bird Table). The seeds are nutritious and remain available through the winter months. Some rodents eat the seeds, including the Thirteen-Lined Ground Squirrel (Martin et al., 1951/1961). Mammalian herbivores eat the bitter foliage of this and other ragweeds to a limited extent."
	CABI. 2018. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	[Unlikely to be bird-dispersed] "Seeds of <i>A. psilostachya</i> are eaten by bobwhite quail (<i>Colinus virginianus</i>) and whole plants and eaten by deer (<i>Odocoileus hemionus</i>) and white-tailed deer (<i>Odocoileus virginianus</i>) (Soltero Gardea, 1991; Soltero-Gardea et al., 1994; Vermeire and Gillen, 2000). It is assumed that these seeds retain viability though this is not proven."

707	Propagules dispersed by other animals (externally)	y
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	[No evidence] "Perennial ragweed spreads widely because the fruit is well adapted to tangle in wool and stick to furred animals, clothing, bags and other fibrous materials. Spread also occurs when the seeds, in mud, stick to animals, farm machinery and vehicles of all kinds."

708	Propagules survive passage through the gut	
	Source(s)	Notes
	Montagnani, C., Gentili, R., Smith, M., Guarino, M. F., & Citterio, S. (2017). The Worldwide Spread, Success, and Impact of Ragweed (<i>Ambrosia</i> spp.). <i>Critical Reviews in Plant Sciences</i> , 36(3), 139-178	"Finally, although the species is not highly palatable to cattle or bison, endozoochory was also inferred by Rosas et al. (2008), who found a percentage of <i>Ambrosia</i> spp. seeds in dung of bison grazing in prairies where <i>A. psilostachya</i> was a common forb. In any case, although studies about the role of Western ragweed seed intake in bird diets have been published (Campbell-Kissock et al., 1985), clear evidence of seed dispersal by animals is yet to be collected, as well as other means of diffusion."
	Hilty, J. 2017. Prairie Wildflowers of Illinois - <i>Ambrosia psilostachya</i> (Western Ragweed). http://www.illinoiswildflowers.info . [Accessed 4 May 2018]	"Like Common Ragweed ... the seeds of Western Ragweed are a popular source of food for many kinds of granivorous songbirds and upland gamebirds (see Bird Table). The seeds are nutritious and remain available through the winter months. Some rodents eat the seeds, including the Thirteen-Lined Ground Squirrel (Martin et al., 1951/1961). Mammalian herbivores eat the bitter foliage of this and other ragweeds to a limited extent."
	CABI. 2018. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	[Possibly] "Seeds of <i>A. psilostachya</i> are eaten by bobwhite quail (<i>Colinus virginianus</i>) and whole plants and eaten by deer (<i>Odocoileus hemionus</i>) and white-tailed deer (<i>Odocoileus virginianus</i>) (Soltero Gardea, 1991; Soltero-Gardea et al., 1994; Vermeire and Gillen, 2000). It is assumed that these seeds retain viability though this is not proven."

801	Prolific seed production (>1000/m2)	n

Qsn #	Question	Answer
	Source(s)	Notes
	Montagnani, C., Gentili, R., Smith, M., Guarino, M. F., & Citterio, S. (2017). The Worldwide Spread, Success, and Impact of Ragweed (<i>Ambrosia</i> spp.). <i>Critical Reviews in Plant Sciences</i> , 36(3), 139-178	"Apart from <i>A. psilostachya</i> , ragweed species produce large amounts of seeds, which establishes conspicuous soil seed banks" ... "Seed production of <i>A. psilostachya</i> is very low and, in some studies, the species was even classified as a nonseeded forb (Table 4; Grygiel et al., 2012)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"...dormant seeds are able to survive many years in the soil, as is demonstrated by the reappearance of a patch of perennial ragweed at Speed, Victoria, several years after all existing plants had been eliminated."

803	Well controlled by herbicides	y
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"Chemical Control: Herbicide should be applied to Cuman ragweed during the late vegetative stage before the formation of flowerbuds; western ragweed is moderately or totally resistant during other growth phases [93,111]. Before flowering, it is susceptible and may be controlled with one foliage spray application at 1 pound active ingredient per acre (1.1 kg ai/ha) for 2,4-D, 2,4,5-T, Silvex, 2,4,-D-B or 0.25 pound active ingredient per acre (0.28 kg ai/a) Grazon PC and Banvel [43,83,93]. Grazon P + D will give control for more than 1 year [43]."
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"Effective control can, however, be obtained with herbicides. Such treatments may need to be repeated regularly over a period of several years to prevent recolonization from dormant seeds in the soil. Spray annually at the budding stage with low volatile ester 2,4-D, triclopyr, dicamba or picloram + 2,4-D."

Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Pavek, D. S. 1992. <i>Ambrosia psilostachya</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/ambpsi/all.html . [Accessed 4 May 2018]	"As a component of North American grasslands, Cuman ragweed has evolved with fire. Soil can insulate roots from lethal temperatures during a fire. Surface rhizomes of Cuman ragweed may be killed during a fire; however, the plant also has deep-seated rhizomes which would survive most fires [6]."
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"Cultivation is not an effective means of control because of the difficulty of killing the extensive root system. It is, in fact, advantageous to the plant because it spreads root fragments and stimulates new growth."
	Georgia, A. E. 1919. <i>A Manual of Weeds: With Descriptions of All the Most Pernicious and Troublesome Plants in the United States and Canada, Their Habits of Growth and Distribution, with Methods of Control</i> . The MacMillian Company, New York	"This is a much harder weed to combat than its annual relatives, for one must have a care in cultivation not to break up and spread abroad the creeping rootstocks and thus increase the plague. "

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2018. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad climate suitability & environmental versatility
- Naturalized in regions with subtropical climates
- Widely naturalized (but no evidence from Hawaiian Islands to date)
- Disturbance and agricultural weed
- Other *Ambrosia* species are invasive
- Allelopathic
- Unpalatable at certain stages of growth
- Alternate host of grape pathogenic bacteria
- Allergenic pollen
- Fire hazard
- Shade tolerant
- Tolerates many soil types
- Forms dense stands
- Geophyte life form
- Reproduces by seeds & vegetatively by rhizomes
- Reaches maturity in 2nd growing season
- Seeds dispersed externally in mud stuck to equipment, vehicles & animals
- Seeds persist in the soil for many years
- Able to resprout after cutting & fire

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Limited seed production
- Herbicides provide effective control