

Taxon: Cenchrus longisetus M. C. Johnst.

Family: Poaceae

Common Name(s): feather grass
feathertop
long-style feather grass
white-foxtail

Synonym(s): Pennisetum villosum R. Br. ex Fresen.

Assessor: No Assessor

Status: Assessor Approved

End Date: 27 Apr 2018

WRA Score: 21.0

Designation: H(HPWRA)

Rating: High Risk

Keywords: Perennial Grass, Pasture Weed, Unpalatable, Rhizomatous, Externally Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
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	n
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		
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	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
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	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
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	y
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		
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	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	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/m ²)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	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
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[No evidence of domestication] "East Africa, Ethiopia, Yemen, Somalia. Perennial, low to semidecumbent, mat-forming, in dense large tussocks or scattered among other grasses," ... "drought-resistant, showy and ornamental, noxious weed species, cultivated and naturalized elsewhere, usually unpalatable to stock or useful for grazing, growing in gardens, open grassy places, deep soil, damp soil, banks around fields, damp sandy places, along irrigation channels, irrigated land, on clay soils, lawns, in disturbed areas, rocky hillsides, along railway lines and on roadsides, in forest"

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"	High
	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 26 Apr 2018]	"Native Africa NORTHEAST TROPICAL AFRICA: Eritrea, Ethiopia, Somalia (n.) Asia-Temperate ARABIAN PENINSULA: Yemen"

202	Quality of climate match data	High
	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 26 Apr 2018]	

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

Qsn #	Question	Answer
	The Royal Horticultural Society. 2018. Pennisetum villosum - feathertop. https://www.rhs.org.uk/Plants/86913/Pennisetum-villosum/Details . [Accessed 27 Apr 2018]	"Hardiness - H3 - Hardy in coastal and relatively mild parts of the UK (-5 to 1)"
	Dave's Garden. 2018. Feathertop Fountain Grass - Pennisetum villosum. https://davesgarden.com/guides/pf/go/1492/ . [Accessed 27 Apr 2018]	"Hardiness: USDA Zone 9a: to -6.6 °C (20 °F) USDA Zone 9b: to -3.8 °C (25 °F) USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F)"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"East Africa, Ethiopia, Yemen, Somalia."
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 26 Apr 2018]	"Native Africa NORTHEAST TROPICAL AFRICA: Eritrea, Ethiopia, Somalia (n.) Asia-Temperate ARABIAN PENINSULA: Yemen Naturalized Africa MACARONESIA: Portugal, [Azores, Madeira Islands] Spain [Canary Islands] NORTHERN AFRICA: Algeria, Morocco SOUTHERN AFRICA: South Africa Australasia NEW ZEALAND: New Zealand Europe SOUTHEASTERN EUROPE: Greece, Italy (incl. Sardinia) SOUTHWESTERN EUROPE: France, [Corsica] Spain (incl. Balears) Northern America NORTHERN MEXICO: Mexico [Durango, Nuevo Leon, Sinaloa, Tamaulipas, Zacatecas] SOUTHERN MEXICO: Mexico [Aguascalientes, Chiapas, Colima, Federal District, Jalisco, Mexico, Michoacan, Morelos, Queretaro] Southern America BRAZIL: Brazil [Sao Paulo] WESTERN SOUTH AMERICA: Bolivia SOUTHERN SOUTH AMERICA: Argentina, Chile, Uruguay"

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

Qsn #	Question	Answer
	<p>USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 27 Apr 2018]</p>	<p>"Cultivated Northern America United States Naturalized Africa MACARONESIA: Portugal, [Azores, Madeira Islands] Spain [Canary Islands] NORTHERN AFRICA: Algeria, Morocco SOUTHERN AFRICA: South Africa Australasia NEW ZEALAND: New Zealand Europe SOUTHEASTERN EUROPE: Greece, Italy (incl. Sardinia) SOUTHWESTERN EUROPE: France, [Corsica] Spain (incl. Balears) Northern America NORTHERN MEXICO: Mexico [Durango, Nuevo Leon, Sinaloa, Tamaulipas, Zacatecas] SOUTHERN MEXICO: Mexico [Aguascalientes, Chiapas, Colima, Federal District, Jalisco, Mexico, Michoacan, Morelos, Queretaro] Southern America BRAZIL: Brazil [Sao Paulo] WESTERN SOUTH AMERICA: Bolivia SOUTHERN SOUTH AMERICA: Argentina, Chile, Uruguay"</p>

301	Naturalized beyond native range	y
	Source(s)	Notes
	<p>USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 26 Apr 2018]</p>	<p>"Naturalized Africa MACARONESIA: Portugal, [Azores, Madeira Islands] Spain [Canary Islands] NORTHERN AFRICA: Algeria, Morocco SOUTHERN AFRICA: South Africa Australasia NEW ZEALAND: New Zealand Europe SOUTHEASTERN EUROPE: Greece, Italy (incl. Sardinia) SOUTHWESTERN EUROPE: France, [Corsica] Spain (incl. Balears) Northern America NORTHERN MEXICO: Mexico [Durango, Nuevo Leon, Sinaloa, Tamaulipas, Zacatecas] SOUTHERN MEXICO: Mexico [Aguascalientes, Chiapas, Colima, Federal District, Jalisco, Mexico, Michoacan, Morelos, Queretaro] Southern America BRAZIL: Brazil [Sao Paulo] WESTERN SOUTH AMERICA: Bolivia SOUTHERN SOUTH AMERICA: Argentina, Chile, Uruguay"</p>
	<p>Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL</p>	<p>"noxious weed species, cultivated and naturalized elsewhere"</p>

Qsn #	Question	Answer
	Edgar, E., & Shand, J. E. (1987). Checklist of Panicoid grasses naturalised in New Zealand; with a key to native and naturalized genera and species. <i>New Zealand Journal of Botany</i> , 25(3), 343-353	" <i>Pennisetum villosum</i> R. Br. Feathertop DISTRIBUTION: Scattered throughout North I. except Wellington Province; Marlborough (Blenheim, Tuamarina, south bank of Clarence R.), Christchurch, Te Anau."
	Herbst, Derral R. & Clayton, W. D. 1998. Notes on the grasses of Hawai'i: new records, corrections, and name changes. <i>Bishop Museum Occasional Papers</i> . 55:17-38	"The following record of <i>Pennisetum villosum</i> represents the first state record of this species in the Hawaiian Islands. It apparently was naturalized at least at this 1 locality, but its present status is unknown. The plant is native to northeastern Africa and Arabia, and has been introduced elsewhere as an ornamental. Material examined. HAWAII: North Kona, Hu'e'hu'e, growing nicely by Mr. Stillman's house, eaten by horses, Jun 1938, Vredenberg s.n. (BISH 120181)."

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Queensland Government. (2018). Weeds of Australia. <i>Cenchrus longisetus</i> . http://keyserver.lucidcentral.org . [Accessed 27 Apr 2018]	"A weed of pastures, roadsides, footpaths, parks, waste areas, disturbed sites and waterways in semi-arid, sub-tropical and temperate regions." [A disturbance weed with negative impacts on agriculture & potentially the natural environment]

303	Agricultural/forestry/horticultural weed	y
	Source(s)	Notes
	Eurobodalla Shire Council. 2018. South Coast Weeds - Foxtail or feathertop grass (<i>Pennisetum villosum</i>). http://www.esc.nsw.gov.au . [Accessed 27 Apr 2018]	"Grows in pasture and on road verges, tolerating a range of conditions including dry infertile soils. Mature plants are unpalatable to stock, so the plant can become more common in over-grazed pasture. A weed of remnant grassy native vegetation in farming areas, where it can suppress native groundcover species."
	Randall, J. 1999. Import Risk Analysis. Importation of Weed Species by Live Animals and Unprocessed Fibre of Sheep and Goats. Regulatory Authority Ministry of Agriculture and Forestry. Wellington, NZ	"Mature plants are unpalatable and rarely grazed by stock. Dense clumps can be formed that tend to dominate infested pasture."
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Orchards & Plantations, Pastures, Pome Fruits"
	Parsons, W.T. & Cuthbertson, E.G. 2001. <i>Noxious Weeds of Australia</i> . Second Edition. CSIRO Publishing, Collingwood, Australia	"While young shoots may be eaten, the long serrated leaves of mature plants are unpalatable and rarely grazed by stock. The strong rhizome growth often produces large dense clumps which, over a period, tend to dominate infested pastures and reduce the available grazing area."

304	Environmental weed	
	Source(s)	Notes
	Queensland Government. (2018). Weeds of Australia. <i>Cenchrus longisetus</i> . http://keyserver.lucidcentral.org . [Accessed 27 Apr 2018]	"A weed of pastures, roadsides, footpaths, parks, waste areas, disturbed sites and waterways in semi-arid, sub-tropical and temperate regions." ... "Feathertop (<i>Cenchrus longisetus</i>) is regarded as an environmental weed in Victoria, New South Wales, Tasmania and South Australia."
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Orchards & Plantations, Pastures, Pome Fruits"

Qsn #	Question	Answer
	The Southern Tablelands and South Coast Noxious Plants Committee. 2018. Long style feather grass. http://www.southeastweeds.org.au . [Accessed 27 Apr 2018]	[Potentially] "Feathertop is widespread in NSW and in other eastern states, but usually only a minor weed. However, the underground rhizomes gradually expand the size of clumps, and it can become abundant in pasture. Being unpalatable it reduces carrying capacity. It may occasionally become an environmental weed of grassy woodlands and grasslands."

305	Congeneric weed	y
	Source(s)	Notes
	Marshall, V. M., Lewis, M. M., & Ostendorf, B. 2012. Buffel grass (<i>Cenchrus ciliaris</i>) as an invader and threat to biodiversity in arid environments: a review. <i>Journal of Arid Environments</i> , 78: 1-12	"Buffel grass invasion can devastate local ecosystems by altering wildfire regimes, soil erosion rates, ground surface temperatures and supply of vital resources to surrounding life forms, compromising biodiversity (D'antonio and Vitousek, 1992). Significant invasions have been reported in arid communities throughout Australia, the USA, Mexico and South America and many species and ecosystem functions have been impacted (Table 5)."
	CABI. 2018. <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. www.cabi.org/isc	" <i>C. echinatus</i> occurs as a weed in many crops worldwide. It is common in cultivated fields, pastures, fallows, orchards, vineyards, coffee, vegetables, bananas, coconuts and lawns, where it can withstand repeated defoliation. It can be found along roadsides and beaches, in open ground and waste places. Crops competing for nutrients with <i>C. echinatus</i> typically have smaller leaf areas and lower growth rates and yields (Hammerton, 1981; Everaarts, 1993; Ramos and Pitelli, 1994). The burs of the seed heads can become firmly attached to clothes and coats of animals by the barbed spines. These can penetrate the skin causing painful or annoying injuries. In feeds and hay, the burs of the seed heads reduce the acceptability and palatability of the feed to animals. Nevertheless, it can serve as a forage grass before the burs are formed. <i>C. echinatus</i> also has some relevance as an alternative host for maize streak monogeminivirus and sugarcane streak monogeminivirus (Brunt et al., 1996)."
	Weber, E. 2003. <i>Invasive Plant Species of the World. A Reference Guide to Environmental Weeds</i> . CABI Publishing, Wallingford, UK	[Now in the genus <i>Cenchrus</i>] " <i>Pennisetum clandestinum</i> ..."mat-forming and smothers native plants, eliminating all species [Invasive in natural areas of S. Africa, Australia, New Zealand, Caribbean, Galapagos and Hawaiian Islands]... <i>P. macrourum</i> [invasive in natural areas of Australia and New Zealand]... <i>P. polystachion</i> [invasive in Australia]... <i>P. purpureum</i> [invasive in natural areas of SE USA, Southern Africa, Galapagos]... <i>P. setaceum</i> [invasive in natural areas of Australia, Western USA and Hawaiian Islands]

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Clayton, W.D., Vorontsova, M.S., Harman, K.T. and Williamson, H. 2006 onwards. <i>GrassBase - The Online World Grass Flora</i> . http://www.kew.org/data/grasses-db.html . [Accessed 26 Apr 2018]	[No evidence] "HABIT Perennial; mat forming. Rhizomes elongated. Culms geniculately ascending, or decumbent; 15–90 cm long. Ligule a fringe of hairs. Leaf-blades flat, or conduplicate; 7–15 cm long; 2–6 mm wide."

402	Allelopathic	

Qsn #	Question	Answer
	Source(s)	Notes
	WRA Specialist. 2018. Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Perennial, low to semidecumbent, mat-forming, in dense large tussocks or scattered among other grasses" [Poaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"usually unpalatable to stock"
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"While young shoots may be eaten, the long serrated leaves of mature plants are unpalatable and rarely grazed by stock."

405	Toxic to animals	n
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	n
	Source(s)	Notes
	Royal Botanic Gardens Kew. (2018) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 27 Apr 2018]	"Pests - Generally pest free Diseases - Generally disease free "

407	Causes allergies or is otherwise toxic to humans	n
	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	No evidence

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Victorian Resources Online. 2018. Impact Assessment - Feathertop (<i>Pennisetum villosum</i>) in Victoria. http://vro.agriculture.vic.gov.au . [Accessed 27 Apr 2018]	"No information was found to indicate it would have any significant affect on fire regime of habitats in which it occurs and would likely replace other grasses that have similar flammability."

Qsn #	Question	Answer
	Western Australian Herbarium (1998–2018). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 27 Apr 2018]	[May increase fire risk, as do many other non-native grasses in the Hawaiian Islands] "Fire response. Resprouts." ... 'Notes. Spreads rapidly into disturbed areas. Widespread and locally common on roadsides and pastoral areas in parts of New South Wales, Victoria, southern Queensland and South Australia."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Royal Botanic Gardens Kew. (2018) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 27 Apr 2018]	"Full Sun"
	Queensland Government. (2018). Weeds of Australia. <i>Cenchrus longisetus</i> . http://keyserver.lucidcentral.org/ . [Accessed 27 Apr 2018]	[High light environments] "A weed of pastures, roadsides, footpaths, parks, waste areas, disturbed sites and waterways in semi-arid, sub-tropical and temperate regions."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Water Wise Gardening Fresno Region. 2018. <i>Pennisetum villosum</i> . http://www.fresnogardening.org/eplant.php?plantnum=24266&return=l1 . [Accessed 27 Apr 2018]	"It prefers well drained soil but will get by in just about any soil condition."
	Royal Botanic Gardens Kew. (2018) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 27 Apr 2018]	"Soil Sand, Chalk, Loam pH Acid, Alkaline, Neutral"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Perennial, low to semidecumbent, mat-forming, in dense large tussocks or scattered among other grasses,"

412	Forms dense thickets	y
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"mat-forming, in dense large tussocks or scattered among other grasses,"
	Randall, J. 1999. Import Risk Analysis. Importation of Weed Species by Live Animals and Unprocessed Fibre of Sheep and Goats. Regulatory Authority Ministry of Agriculture and Forestry. Wellington, NZ	" <i>Pennisetum villosum</i> ... An erect densely tussock forming perennial grass up to 70 cm high of moister semiarid or arid subtropics, native to North Africa and the Arabian Peninsula. Mature plants are unpalatable and rarely grazed by stock. Dense clumps can be formed that tend to dominate infested pasture."

501	Aquatic	n
	Source(s)	Notes

Qsn #	Question	Answer
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Terrestrial] "growing in gardens, open grassy places, deep soil, damp soil, banks around fields, damp sandy places, along irrigation channels, irrigated land, on clay soils, lawns, in disturbed areas, rocky hillsides, along railway lines and on roadsides, in forest"
502	Grass	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 26 Apr 2018]	Family: Poaceae (alt.Gramineae) Subfamily: Panicoideae Tribe: Paniceae Subtribe: Cenchrinae
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 26 Apr 2018]	Family: Poaceae (alt.Gramineae) Subfamily: Panicoideae Tribe: Paniceae Subtribe: Cenchrinae
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Rhizomatous] "Perennial, low to semidecumbent, mat-forming, in dense large tussocks or scattered among other grasses ... densely tufted or loosely clumped, shortly rhizomatous with creeping rhizome, internodes and nodes glabrous"
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[No evidence] "East Africa, Ethiopia, Yemen, Somalia. ... cultivated and naturalized elsewhere"
602	Produces viable seed	y
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Pennisetum villosum ... branching rootstock, reproducing by seed and from rhizomes"
	Holmes, R. 1997. Taylor's Guide to Ornamental Grasses. Houghton Mifflin Harcourt, New York	"These grasses are especially easy to grow from seed." [List includes Pennisetum villosum]
603	Hybridizes naturally	

Qsn #	Question	Answer
	Source(s)	Notes
	WRA Specialist. 2018. Personal Communication	Unknown. Now evidence found, but intergeneric hybrids documented between other Pennisetum/Cenchrus spp.

604	Self-compatible or apomictic	
	Source(s)	Notes
	Hoshino, T., & Davidse, G. (1988). Chromosome Numbers of Grasses (Poaceae) From Southern Africa. I. Annals of the Missouri Botanical Garden, 75(3), 866-873	"Pennisetum villosum, a native of northern Africa, now widely naturalized in the tropics and subtropics, has been reported as a eudiploid to euhexaploid." ... "The occurrence of triploids, pentaploids, and hexaploids with irregular meiosis suggests the likelihood of apomixis in this species."

605	Requires specialist pollinators	n
	Source(s)	Notes
	Zomlefer, W.B. 1994. Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London	"The reduced flowers are anemophilous" [Wind-pollinated. Poaceae family description]

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"reproducing by seed and from rhizomes." ... "The strong rhizome growth often produces large dense clumps which, over a period, tend to dominate infested pastures and reduce the available grazing area." ... "Summer cultivation gives effective control, but it must be thorough and repeated regularly until the weed is eliminated. A single cultivation only spreads rhizome fragments to clean areas."
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"shortly rhizomatous with creeping rhizome"

607	Minimum generative time (years)	1
	Source(s)	Notes
	Shoot Gardening. 2018. Pennisetum villosum (Feathertop). https://www.shootgardening.co.uk/plant/pennisetum-villosum . [Accessed 26 Apr 2018]	"1-2 years To maturity"
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Seeds germinate in early summer but establishment is slow and seedlings rarely survive in the field. Most reproduction is from the crown and rhizomes during late spring and summer if sufficient moisture is present. Flowering occurs in late summer and seeds mature in March and April."
	Gardenia. 2018. Pennisetum villosum (Feathertop Grass). https://www.gardenia.net/plant/pennisetum-villosum-feathertop-grass . [Accessed 26 Apr 2018]	"While a perennial grass, it is tender and often grown as an annual."

Qsn #	Question	Answer
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	"Major spread is the result of cultivation and road grading, while normal rhizome growth increases the size and density of existing colonies. Some seed held within the involucre bristles adheres to wool and fur of animals, as well as to clothing, bags and other fibrous materials. They may also be moved in wind and water, especially air currents created by passing vehicles ..."
	Western Australian Herbarium (1998–2018). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 26 Apr 2018]	"Reproduction. Seed and rhizomes. Dispersal. Wind, animals, clothing, soil on vehicle tyres and machinery, roadside slashing/mowing."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"drought-resistant, showy and ornamental, noxious weed species, cultivated and naturalized elsewhere"

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes
	Gardenia. 2018. Pennisetum villosum (Feathertop Grass). https://www.gardenia.net/plant/pennisetum-villosum-feathertop-grass . [Accessed 26 Apr 2018]	"Cut flowers" [Possible seed contaminant in floral arrangements]
	Randall, J. 1999. Import Risk Analysis. Importation of Weed Species by Live Animals and Unprocessed Fibre of Sheep and Goats. Regulatory Authority Ministry of Agriculture and Forestry. Wellington, NZ	"Some seed held within involucre bristles can adhere to wool and fur." [produce contaminant of wool products]

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Western Australian Herbarium (1998–2018). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 26 Apr 2018]	"Reproduction. Seed and rhizomes. Dispersal. Wind, animals, clothing, soil on vehicle tyres and machinery, roadside slashing/mowing."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Some seed held within the involucre bristles adheres to wool and fur of animals, as well as to clothing, bags and other fibrous materials. They may also be moved in wind and water, especially air currents created by passing vehicles but, because of poor seedling establishment, these methods are usually not important."

705	Propagules water dispersed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Some seed held within the involucre bristles adheres to wool and fur of animals, as well as to clothing, bags and other fibrous materials. They may also be moved in wind and water, especially air currents created by passing vehicles but, because of poor seedling establishment, these methods are usually not important."

706	Propagules bird dispersed	n
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Some seed held within the involucre bristles adheres to wool and fur of animals, as well as to clothing, bags and other fibrous materials. They may also be moved in wind and water, especially air currents created by passing vehicles but, because of poor seedling establishment, these methods are usually not important."
	WRA Specialist. 2018. Personal Communication	No evidence. Birds that eat seeds would probably function as seed predators rather than dispersers

707	Propagules dispersed by other animals (externally)	y
	Source(s)	Notes
	Randall, J. 1999. Import Risk Analysis. Importation of Weed Species by Live Animals and Unprocessed Fibre of Sheep and Goats. Regulatory Authority Ministry of Agriculture and Forestry. Wellington, NZ	"Some seed held within involucre bristles can adhere to wool and fur."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Some seed held within the involucre bristles adheres to wool and fur of animals, as well as to clothing, bags and other fibrous materials."

708	Propagules survive passage through the gut	
	Source(s)	Notes
	Woldu, Z., & Saleem, M. M. (2000). Grazing induced biodiversity in the highland ecozone of East Africa. Agriculture, Ecosystems & Environment, 79(1), 43-52	[Possibly Yes] "Table 1. List of species in manure seed bank (M), no grazing plots (NOG) and very heavily grazed (VHVG)a" [Pennisetum villosum present in manure seed bank and very heavily grazed sites]
	WRA Specialist. 2018. Personal Communication	May be consumed incidentally during grazing, but no data on survival

801	Prolific seed production (>1000/m ²)	
	Source(s)	Notes
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Although longstyle feather grass is a prolific seeder, only a few seedlings establish, growing best in sandy soils but not restricted to them." [Seed densities unspecified]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes

Qsn #	Question	Answer
	Western Australian Herbarium (1998–2018). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 26 Apr 2018]	"Seedbank persistence. Possibly less than 12 months."
	Royal Botanic Gardens Kew. (2018) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 26 Apr 2018]	"Storage Behaviour: Orthodox. Storage Conditions: Seeds maintained for 2-3 years in commercial storage conditions (Priestley, 1986)"

803	Well controlled by herbicides	y
	Source(s)	Notes
	Western Australian Herbarium (1998–2018). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 26 Apr 2018]	"Suggested method of management and control. Individual plants can be manually removed. Best controlled as an immature plant, following fire and/or prior to flowering and seed set. Spray with 1% glyphosate. Thick old tussocks may be easier to control if burnt or slashed down to 10cm above ground and allowed to reshoot before applying herbicide."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Where cultivation is impractical, herbicides give good control but may be expensive. Spray in autumn with 2,2-DPA, amitrole T, glyphosate or fluazifop butyl, thoroughly wetting the plants. In pint-apples, bromacil and diuron give good control for about 4 to 5 months."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Western Australian Herbarium (1998–2018). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 26 Apr 2018]	" <i>Pennisetum villosum</i> ... Reproduction. Seed and rhizomes. Dispersal. Wind, animals, clothing, soil on vehicle tyres and machinery, roadside slashing/mowing. Photosynthetic Pathway. C4. Seedbank persistence. Possibly less than 12 months. Fire response. Resprouts."
	Parsons, W.T. & Cuthbertson, E.G. 2001. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Summer cultivation gives effective control, but it must be thorough and repeated regularly until the weed is eliminated. A single cultivation only spreads rhizome fragments to clean areas."

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

- Thrives in tropical climates
- Widely naturalized, included Hawaii Island
- A roadside & disturbance weed
- An agricultural weed that invades pastures & reduces forage
- Potential environmental weed
- Other *Cenchrus* (*Pennisetum*) species are invasive
- Unpalatable at older stages of growth
- Tolerates many soil types
- Forms dense stands
- Reproduces by seeds & vegetatively by rhizomes
- Able to reach maturity in one growing season
- Seeds dispersed by sticking to clothing, fur, mud on vehicles & equipment, wind, water, intentionally by people & by dumped garden waste & rhizome fragments
- Resprouts after cutting & fire

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Palatable when young
- Ornamental
- Prefers full sun & high light environments
- Herbicides may provide effective control