



# Pest risk assessment

African fountain grass (*Cenchrus setaceus* syn.  
*Pennisetum setaceum*)

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## Summary

African fountain grass (*Cenchrus setaceus* syn. *Pennisetum setaceum*) is a perennial grass native to drier parts of northern and eastern Africa and south-western Asia. It has been planted extensively in Queensland as a garden ornamental and has naturalised in proximity to most planting sites. It spreads via wind-blown seeds.

African fountain grass is a major weed in Hawaii, where it has colonised thousands of hectares of early successional plant communities on old lava flows. In California, it has increased fire frequency and converted desert shrub communities into grassland.

Climate modelling suggests African fountain grass is well-suited to extensive areas of arid and semi-arid Australia, including large areas of Queensland. The species is currently in its early stages of population development in Queensland but is predicted to become a major pest over the long-term. Habitats most at-risk are naturally open, hot, rocky sites in the arid and semi-arid zones, particularly rocky ridges. While perhaps best-adapted to inland climates, it can still thrive on exposed, rocky, hot sites in high rainfall coastal areas.

Based on the evidence collected in this weed risk assessment, it seems reasonable to conclude that African fountain grass is a high-risk species and that current restrictions on sale in Queensland are justified.

## Identity and taxonomy

**Species identity:** *Cenchrus setaceus* (Forssk.) syn. *Pennisetum setaceum* (Forssk.) Chiov.

**Synonyms:** *Pennisetum ruppelii* Steud., *P. macrostachyum* Fresen., *P. rueppelianum* Hort., *Phalaris setacea* Forssk.

**Cultivars:** 'Rubrum', 'Eaton Canyon'

**Common names:** fountain grass, crimson fountain grass (California), tender fountaingrass

**Family:** Poaceae

All species of *Pennisetum* have been transferred to *Cenchrus* and the accepted scientific name of the taxon is currently *Cenchrus setaceus* (Forssk.) Morrone (Queensland Herbarium 2025).

## Description

*C. setaceus* is an erect, densely-tufted perennial which grows to about 1 m tall. The culms are sometimes branched near the base and the nodes are glabrous. Leaf sheaths are more or less glabrous except for cilia on the margins. Ligules are a ciliate rim. Leaf blades are linear, convolute, folded or flat, with a tapered apex, mostly 8–30 cm × 0.05–0.3 cm, glabrous or with a few hairs towards the base, scabrous above and on the margin. The inflorescence is a pinkish, feathery spike, 10–25 cm × 1.2–1.6 cm, excluding bristles. One to three spikelets are arranged in clusters on stalks 1–3 mm long. Each cluster is enclosed by numerous bristles, usually up to 2.6 cm long with one bristle up to 4 cm long. Spikelets are 4.5–6.5 mm long; lower glume absent or up to one-third length of spikelet, upper glume one-quarter to two-thirds the length of spikelet, one-nerved; lower floret sterile or male, lemma more or less as long as spikelet, one- to five-nerved, scabrous on nerves, palea absent or up to as long as lemma; upper floret bisexual or male, lemma as long as spikelet, with mucro up to 1 mm long, five-nerved, scabrous towards apex, occasionally margin ciliate, palea slightly shorter than lemma (Stanley and Ross 1989). The fruits are small, dry achenes adorned with long showy bristles (Benton 1997).



**Image 1.** African fountain grass in a garden.

## Biology and ecology

*C. setaceus* is a perennial plant that can live for up to 20 years (CDFA 2001), although most specimens live for a shorter time. Flowering occurs over a prolonged period from spring through summer.

*C. setaceus* is reported to be apomictic (asexual reproduction where embryos develop without fertilisation) and to a lesser extent, out-crossing (CDFA 2001). Pollination is required for apomictic seed development. Seeds require several months (autumn to early spring) to

mature. Flower heads typically remain intact during this period, giving the impression that the plant flowers throughout the year. The plant utilises the C4 photosynthetic pathway and is more or less winter-dormant (CDFA 2001).

## Reproduction and dispersal

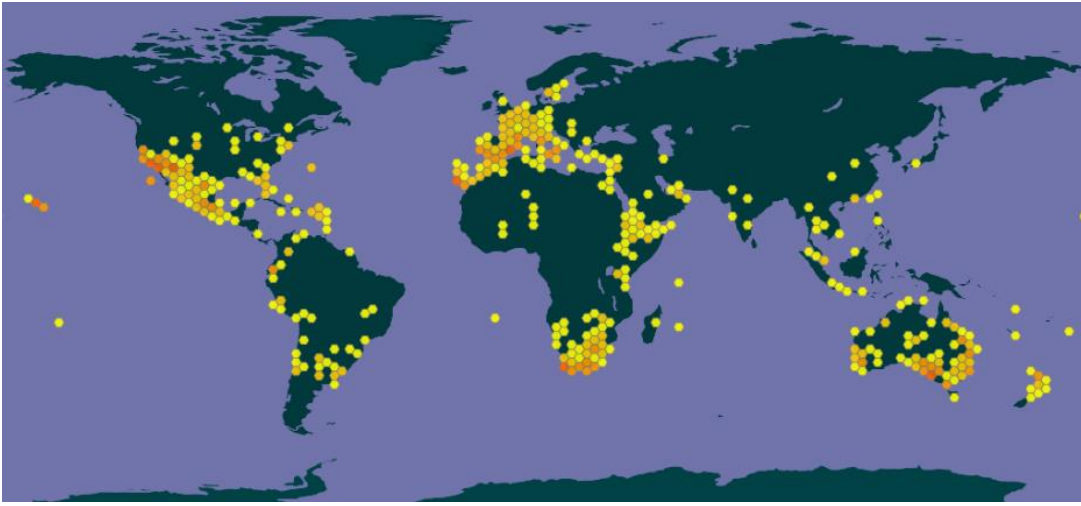
Most seeds germinate in late spring through to early summer. Seeds are primarily wind-dispersed (Benton 1997). Other dispersal vectors include flowing water, vehicles and livestock (seeds attached to fur), and perhaps kangaroos and people. Field evidence in Hawaii suggests that seeds can survive for more than six years in the soil (Benton 1997; CDFA 2001). Ornamental cultivars such as 'Rubrum' and 'Eaton Canyon' usually do not produce seeds (CDFA 2001).



**Image 2.** African fountain grass raceme.

## Origin and distribution

*C. setaceus* is native to the drier parts of northern and eastern Africa and south-western Asia (Stanley and Ross 1989). It was probably introduced into Australia for use as a garden ornamental as it is widely cultivated for its 'graceful, arching habit' (Harden 1993). Naturalised populations are scattered across North America (especially California), Hawaii and Mexico (GBIF 2025) (Figure 1).



**Figure 1.** Global distribution of African fountain grass (Source: GBIF 2025).

## Preferred habitat

*C. setaceus* prefers exposed, hot, dry habitats, particularly rocky or stony areas, but can also colonise sandy sites. It is commonly seen growing in cracks in concrete and rocks along roadsides, urban places and other open, disturbed sites. It appears adapted to arid and semi-arid climates, but can persist on rocky or otherwise exposed sites in high rainfall coastal areas.

In Hawaii, *C. setaceus* grows in xeric (dry) and mesic (wet) habitats on rangelands, barren volcanic substrates, sand hills and other relatively open sandy sites (Tunison 1992; Loope *et al.* 1992) with a wide elevational range from sea level to 2740 m (Tunison 1992). It is limited to areas with a median annual rainfall of less than 1250 mm (Benton 1997).

In California, it invades undisturbed coastal dunes, coastal sage scrub, desert shrubland, grasslands, canyons and roadsides (CDFA 2001; Benton 1997). It also grows in rock crevices and pavement cracks. *C. setaceus* does not tolerate prolonged periods of freezing or saline conditions (CDFA 2001).

## History as a weed elsewhere

*C. setaceus* has naturalised in New South Wales, Western Australia and South Australia (Hnatiuk 1990). In South Australia, it exists along roadsides east of Murray Bridge, north of Port Wakefield, west of Port Augusta and in Adelaide (J. Virtue, pers. comm.).

*C. setaceus* is considered invasive in Hawaii, southern United States, Mexico, Puerto Rico, Namibia, South Africa, the Canary Islands, France, Italy, Australia, New Caledonia, Spain and New Zealand (Areces-Berazain 2023; Holm *et al.* 1979; Wells *et al.* 1986).

*C. setaceus* is considered one of the most disruptive alien species in Hawaii, where it poses a major threat to a number of critically endangered plant species and plant communities (Smith 1985; Benton 1997). It was first collected in Hawaii in 1914 and is now recognised as a highly aggressive, fire-adapted coloniser that readily outcompetes native plants. It has invaded many types of natural areas, from bare lava flows to rangelands. On lava flows, it can disrupt primary succession and has formed monospecific stands (Images 3 and 4). Dense growth increases fuel loads, which increases the intensity and spread of fires, resulting in severe damage to native, dry forest species adapted to less extreme fire regimes (Benton 1997). Hawaiian authorities have been trying to control *C. setaceus* for many years (Loope *et al.* 1992).



**Image 3.** African fountain grass dominating primary succession in Hawaii (Source: Forest and Kim Starr CC BY 3.0).

In South Africa, *C. setaceus* has invaded native vegetation and pastures in dry areas. It also contaminates seed products (Wells *et al.* 1986).

In the United States, it has naturalised in Arizona, California, Colorado, Hawaii, Florida, Louisiana and Tennessee. It is spreading in southern California and desert regions of the south-western United States and Mexico. In California, it exists in central and south-western regions, especially coastal areas, including the San Francisco Bay region, the delta area of the Central Valley and the Sonoran Desert, to an elevation of 600 m (CDFA 2001). Invaded habitats include desert grasslands, canyons, roadsides, wet montane shrublands and coastal dunes. It has increased fire frequency in some areas, contributing to the conversion of desert shrub communities to grassland (CDFA 2001).



**Image 4.** African fountain grass (grey area) dominating primary succession in Hawaii (Source: Forest and Kim Starr CC BY 3.0).

*C. setaceus* is considered one of the most invasive species in Tenerife (Canary Islands), where it has invaded coastal habitats, forming pure stands, and displacing native species (Da Re *et al.* 2020). Up to 30% of all protected areas in the Canary Islands have been invaded by *C. setaceus* (González-Rodríguez *et al.* 2010). The plant is believed to have a symbiotic relationship with local mycorrhizal fungi, contributing to its success as an invader (Rodríguez-Caballero *et al.* 2018). Throughout the Canary Islands, *C. setaceus* is associated with an invasive leafhopper *Balclutha brevis* (Bella & D’Urso 2012). *C. setaceus* has replaced a native grass species *Hyarrhenia hirta* in parts of Spain (Rodríguez-Caballero *et al.* 2017).

*C. setaceus* has a history of reducing native species diversity in Australia and overseas. A list of the grass species impacted is presented in Table 1.

**Table 1.** A list of grass species threatened by *C. setaceus* within its invasive range, adapted from Areces-Berazain 2023; Rodríguez-Caballero *et al.* 2017).

Threatened species	Where threatened
<i>Argyranthemum lidii</i>	Canary Islands
<i>Hyarrhenia hirta</i>	Spain
<i>Eragrostis deflexa</i>	Hawaii
<i>Festuca hawaiiensis</i>	Hawaii
<i>Haplostachys haplostachya</i>	Hawaii
<i>Kadua coriacea</i>	Hawaii
<i>Neraudia ovata</i>	Hawaii
<i>Portulaca sclerocarpa</i>	Hawaii
<i>Schiedea hawaiiensis</i>	Hawaii
<i>Silene lanceolata</i>	Hawaii

<i>Solanum incompletum</i>	Hawaii
<i>Tetramolopium arenarium</i>	Hawaii
<i>Zanthoxylum hawaiiense</i>	Hawaii

## Current distribution and impact

*C. setaceus* has been widely planted as an ornamental in Australia and overseas. In Australia, it has formed small populations over a wide range from Western Australia to the south-eastern corner of South Australia, including eastern Queensland, the greater Brisbane area and New South Wales (Hnatiuk 1990). There are few areas where it can be described as extensive. Perhaps the largest infestations in Queensland are near Mount Morgan and on mine spoil heaps near Ipswich. Near Charters Towers, African fountain grass has dominated rocky ridge lines—habitat used for day-time shelter by rock wallabies (*Petrogale assimilis*) (Images 5 and 6). It is uncertain whether it is having any negative impacts, however, as rock wallabies generally graze in nearby lowlands (Images 5 and 6).



**Image 5.** African fountain grass dominating rock wallaby habitat near Charters Towers.

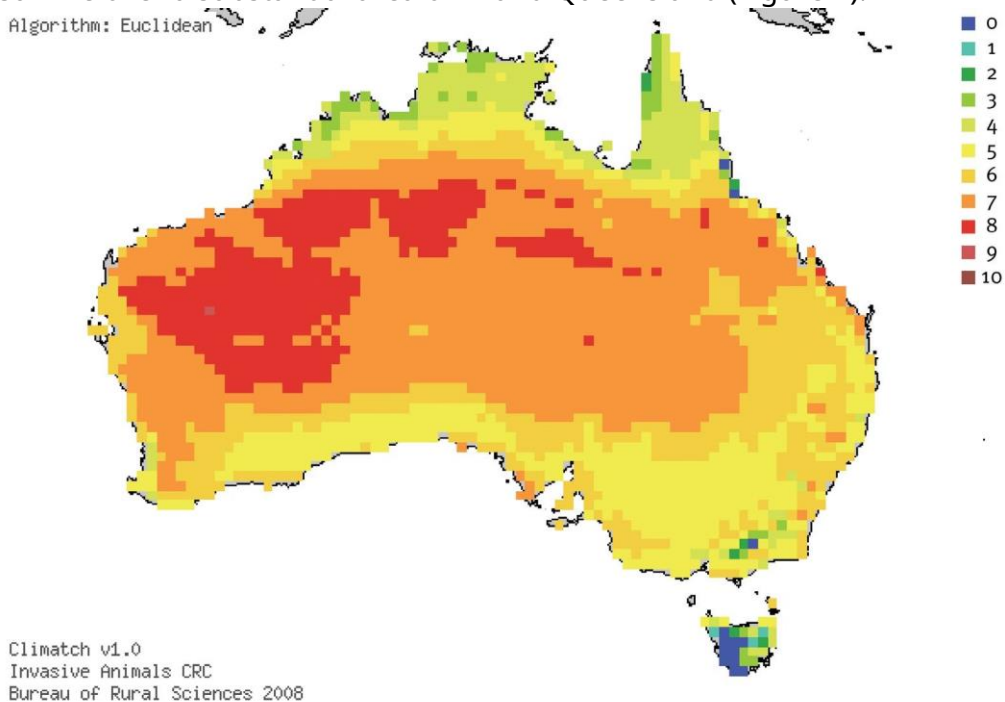


**Image 6.** Rock wallaby habitat near Charters Towers dominated by African fountain grass.

## Pest potential in Queensland

*C. setaceus* has several attributes that confer invasive potential in Queensland. Perhaps most importantly, it has a history as a significant weed overseas in tropical and subtropical climates.

Climatically, the plant is well-suited to arid and semi-arid regions, but can persist in coastal areas, particularly exposed, rocky sites that get hot in summer. At-risk areas in Australia, as well as northern and eastern Africa, fall within a latitudinal range of 28° to 10° a range corresponding to the region between northern New South Wales and Cape York. Climate modelling using the computer program Climatch (BRS 2009) suggests the species could survive over a substantial area of inland Queensland (Figure 2).



**Figure 2.** Areas of Australia where climate appears suitable for *C. setaceus*. Map produced using Climatch computer software (BRS 2009).

Habitats at-risk of invasion include virtually any open, dry, rocky sites. These could include semi-arid and arid shrubland, grasslands and ridgelines (Figure 9). Exposed (hot) urban habitats, such as mine spoil heaps, road-cuttings and cracks in cement footpaths appear particularly prone to colonisation.

*C. setaceus* might invade open, coastal sand dune communities, as it has done in California. However, areas covered with thick wallum or forests are unlikely to be invaded.

Of concern is the plant's potential to increase fuel loads and fire intensity, thereby destroying or modifying native plant communities that are adapted to less intense and perhaps less frequent fires. In California, more intense fires fuelled by *C. setaceus* have resulted in the conversion of shrubland to grassland.



**Image 7.** Elevated, rocky ridges such as this site near Charters Towers, North Queensland, are at risk of invasion by African fountain grass.

Since *C. setaceus* produces large numbers of wind-dispersed seeds, its spread could be rapid and impossible to prevent. The plant appears unpalatable to stock (Wells *et al.* 1986) and could become an unwanted pest in tropical rangeland pastures, particularly on dry, stony or rocky ridges. *C. setaceus* was listed as an environmental weed by Swarbrick and Skarratt (1994) and as a candidate for preventative control by Csurhes and Edwards (1998).

## Feasibility of eradication

Complete eradication from Queensland is no longer possible, as the species is common in gardens across eastern Queensland and has naturalised at numerous sites.

## References

Areces-Berazain, F. (2023). *Pennisetum setaceum* (fountain grass). CABI Compendium. <https://doi.org/10.1079/cabicompendium.116202>

Bella, S., & D'Urso, V. (2012). First record in the Mediterranean basin of the alien leafhopper *Balclutha brevis* living on invasive *Pennisetum setaceum*.

- Benton, N. (1997). *Fountain grass (Pennisetum setaceum)*. Plant Conservation Alliance, Alien Plant Working Group. Retrieved from [www.nps.gov/plants/alien/fact/pese1.htm](http://www.nps.gov/plants/alien/fact/pese1.htm)
- BRS see Bureau of Rural Sciences (2009). *Climatch*. Canberra: Department of Agriculture, Fisheries and Forestry. Retrieved from <https://climatch.cp1.agriculture.gov.au/>
- California Department of Food and Agriculture (2001). *Pennisetum genus*. CDFA. Retrieved from <https://www.cal-ipc.org/plants/paf/pennisetum-setaceum-plant-assessment-form/>
- CDFA see California Department of Food and Agriculture
- Csurhes, S. and Edwards, R. (1998). *Potential environmental weeds of Australia: candidate species for preventative control*. Canberra: National Weeds Program, Environment Australia.
- Da Re, D., Tordoni, E., De Pascalis, F., Negrín-Pérez, Z., Fernández-Palacios, J. M., Arévalo, J. R., ... & Bacaro, G. (2020). Invasive fountain grass (*Pennisetum setaceum* (Forssk.) Chiov.) increases its potential area of distribution in Tenerife Island under future climatic scenarios. *Plant Ecology*, 221, 867-882.
- GBIF see Global Biodiversity Information Facility *Global Biodiversity Information Facility* (2025). *Pennisetum setaceum*. Retrieved from <https://www.gbif.org/species/5828232> accessed 16/09/2025
- González-Rodríguez, A. M., Baruch, Z., Palomo, D., Cruz-Trujillo, G., Jiménez, M. S., & Morales, D. (2010). Ecophysiology of the invader *Pennisetum setaceum* and three native grasses in the Canary Islands. *Acta Oecologica*, 36(2), 248-254.
- Harden, G.J. (1993). *Flora of New South Wales* (Vol. 4). Sydney: New South Wales University Press.
- Hnatiuk, R.J. (1990). *Census of Australian vascular plants*. Australian flora and fauna series no. 11. Canberra: Australian Government Publishing Service.
- Holm, L.G., Pancho, J.V., Herberger, J.P. and Plucknett, D.L. (1979). *A geographical atlas of world weeds*. Florida: Krieger Publishing Company.
- Loope, L.L., Nagata, R.J. and Medeiros, A.C. (1992). Alien plants in Haleakala National Park. In Stone, C.P., Smith, C.W. and Tunison, J.T., *Alien plant invasions in native ecosystems of Hawaii: management and research* (pp. 551–576). Honolulu: University of Hawaii Press.
- Queensland Herbarium. (2025). *Queensland Flora and Fungi Census 2024*. <https://www.data.qld.gov.au/dataset/census-of-the-queensland-flora-and-fungi-2024/resource/79ea3a27-f475-46be-98ca-a1362f90aa5a> accessed 16/09/2025
- Rodríguez-Caballero, G., Caravaca, F., Alguacil, M. M., Fernández-López, M., Fernández-González, A. J., & Roldán, A. (2017). Striking alterations in the soil bacterial community structure and functioning of the biological N cycle induced by *Pennisetum setaceum* invasion in a semiarid environment. *Soil Biology and Biochemistry*, 109, 176-187.
- Rodríguez-Caballero, G., Caravaca, F., & Roldán, A. (2018). The unspecificity of the relationships between the invasive *Pennisetum setaceum* and mycorrhizal fungi may provide advantages during its establishment at semiarid Mediterranean sites. *Science of The Total Environment*, 630, 1464-1471.
- Smith, C.W. (1985). Impact of alien plants in Hawai'i's native biota. In Stone C.P. and Scott J.M. (eds), *Hawai'i's terrestrial ecosystems: preservation and management* (pp. 180–250). Honolulu: National Parks Resources Studies Unit, University of Hawaii.

Stanley, T.D. and Ross, E.M. (1989). *Flora of south-east Queensland* (Vol. 3). Brisbane: Queensland Government, pp. 238–9.

Swarbrick, J.T. and Skarratt, D.B. (1994). *The Bushweed 2 database of environmental weeds in Australia*. Gatton: University of Queensland Gatton College.

Tunison, J.T. (1992). Fountain grass control in Hawaii Volcanoes National Park: management considerations and strategies. In Stone, C.P., Smith, C.W. and Tunison, J.T. *Alien plant invasions in native ecosystems of Hawaii: management and research* (pp. 376–393). Honolulu: University of Hawaii Press.

Wells, M.J., Balsinhas, A.A., Joffe, H., Engelbrecht, V.M., Harding, G. and Stirton, C.H. (1986). *A catalogue of problem plants in Southern Africa*, Memoirs of the Botanical Survey of South-Africa No 53. Pretoria: South Africa.