

Invasive plants and animals

Chilean needle grass

*Nassella neesiana***DECLARED CLASS 1**

Figure 1. Chilean needle grass can form dense invasive stands in open areas

The problem

Chilean needle grass (*Nassella neesiana*) is a Weed of National Significance (WONS) and is considered to be one of the worst weeds in Australia because of its invasive nature, potential for spread, and economic and environmental impacts. Named for its sharp, pointed seeds, it affects pastures and native grasslands in south-eastern Australia through to north-eastern New South Wales. The grass recently has been found on the Darling Downs in southern Queensland and is declared under *the Land Protection (Pest and Stock Route Management Act 2002)* as a Class 1 weed in Queensland.

Heavy infestations displace desirable pasture species and the productivity of infested pastures in southern states has decreased by as much as 50%. The long sharp seeds can cause injury to animals and downgrade lamb and sheep meat, wool, skins and hides.

Chilean needle grass reduces natural biodiversity by replacing native species within native grasslands, grassy woodlands and riparian areas. It tolerates drought, heavy grazing and periodic inundation.



Figure 2. Chilean needle grass is a tussock forming grass with a distinctive wind blown appearance to the flowering head



Figure 3. The seeds of Chilean needle grass have a sharp pointed tip, a long bent awn or tail, and a distinctive red crown or corona where the seed joins the awn

Description

Chilean needle grass is in the speargrass group of grasses. Native to South America, it is a perennial tussock grass which grows in dense clumps sometimes together with other grass species. It can also form pure stands. When not grazed or mowed, the erect foliage can grow up to 1 m tall. Leaves are 1-5 mm wide, flat and strongly ribbed on their upper surface, with leaf edges that are rough to touch. Before flowering the grass is very hard to differentiate from many other tussock grasses.

Flowering generally occurs in November to December but the grass has the capacity to flower year-round if conditions are favourable. Visible flowers develop on long stalks above the foliage. Grazed and mowed plants will develop shorter flowering stems. New flowering heads have a 60 mm long pale green awn (tail) at the end of the seed and a wind blown horizontal appearance. New flowers also have a characteristic dark red colour produced by the bracts (glumes) encasing the seeds. On closer inspection the awn is curved or bent and the seed has a characteristic raised reddish corona between the body of the seed and the awn.



Figure 4. The glumes or bracts encasing the seed of Chilean needle grass are a distinctive purple red colour

The 8–10 mm long seeds are pale brown when mature. The dried straw coloured flowering head can remain on the plant even after seed has dropped.

The grass reproduces from seeds which are produced high on the flowering stems and also from self-fertilised seeds at the joints and base of the flowering stem. The 'stem seeds' (cleistogenes) account for up to 50% of annual seed production and enable the plant to reproduce despite grazing, slashing or burning. Stem seeds can be produced very early in the life of the plant. This grass species can produce more than 20 000 seeds per square metre. The resulting soil seed-bank can persist for many years. Seedlings have a high survival rate and they can flower and produce seeds in their first season.

Spread

Chilean needle grass, unlike many other weeds, has little ability to spread on the wind.

The main method of spread of Chilean needle grass is human assisted spread of seed:

- which adheres to clothing, livestock, vehicles and farm machinery
- in contaminated seeds or fodder
- by slashers and earth-moving equipment.

The grass can also be spread in floodwater moving seed downstream and over floodplains.

Distribution

Chilean needle grass has become a major pest in Victoria and New South Wales. Isolated infestations have also been recorded in South Australia and Tasmania.

Small infestations of the grass have been recorded in the Darling Downs region of Queensland. The grass is climatically suited to south-east Queensland and has the potential to become a major pest in cooler parts of southern Queensland, primarily areas around Stanthorpe, Warwick and Toowoomba. Chilean needle grass has the potential to spread further in sub-humid cooler parts of south-east Queensland.

Control

Prevention

Prevention is the best form of control of any weed. **Hygiene practices**—Good hygiene can be effective in preventing human assisted spread of Chilean needle grass. Cleaning of vehicles, machinery, equipment and other material are very important in preventing further spread, as is controlling the movement of livestock from infested to clean areas. Slashers and mowers can transport seed from infested to non infested sites. Machinery modifications which restrict the build up of seed on slashers and mowers, including guards and fans, assist in preventing the spread of the weed particularly along roadsides.

Feed stock in controlled areas to minimise the risk of seed spread and to limit the area requiring control. Reduce the risk of introduction of this and other weeds by requesting a Weed Hygiene Declaration from suppliers confirming that the material and livestock brought on to the property does not contain weeds or weed seed.

Land management—Chilean needle grass, like many weeds, is symptomatic of prolonged grazing, which tends to eliminate palatable plant species and allow unpalatable species to multiply without restriction. Sustainable land management practices results in systems that are naturally more resilient to weed infestation.

Early detection

Research suggests that if the grass is detected early and acted upon with a great deal of persistence over several years, it is likely it can be controlled and eradication achieved.

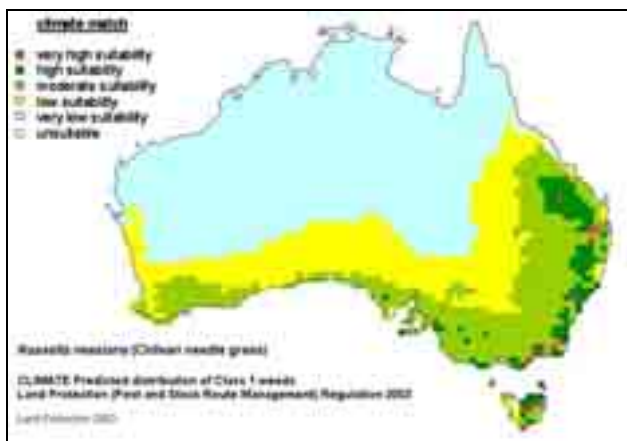


Figure 5. Potential distribution of *Nassella neesiana*, based on climate suitability

Unfortunately, Chilean needle grass is difficult to detect in the field and some degree of skill is required to differentiate it from other grasses, particularly when not in flower. Report suspected infestations to your local Government pest management officer or your local Department of Primary Industries and Fisheries Land Protection Officer who will advise on action to take. If you think you may have found a plant of Chilean needle grass, please send a sample to the Queensland Herbarium for positive identification. The process for collecting and sending plant specimens can be found on the Queensland Herbarium website: www.epa.qld.gov.au/herbarium.

Physical control

Small infestations should be manually removed before they flower and set seed, and destroyed by incineration. Flowering or seeding plants should be bagged on removal to avoid spreading seed. Slashing or mowing before the grass sets seed will remove the bulk of the seed but will not remove basal seeds.

Chemical control

Table 1 details herbicides registered for Chilean needle grass control in Queensland. Always read the label carefully before using any herbicide. All herbicides must be applied strictly according to the directions on the label.

Flupropanate is a residual, non-selective herbicide and little is know of its impact on other grassland and pasture plant species in southern Queensland.

It is recommended that landholders perform trials with this chemical before using widely, and plan for reseeding or other activities to ensure ground cover is maintained.



Figure 6. A flowering head of Chilean needle grass

Declaration details

Nationally Chilean needle grass is a prohibited species under the Quarantine Act (Cth.) 1908 and is therefore not allowed to be brought into Australia.

In Queensland Chilean needle grass is a high priority target for eradication from the state. Land owners must take reasonable steps to keep their land free of this pest. It is an offence to introduce, keep, supply or transport this weed without a permit issued by the Department of Primary Industries and Fisheries, attracting fines of up to \$60 000.

Further information

Further information on Chilean needle grass is available from your local government pest management officer or your regional DPI&F Land Protection Officer.

The following websites have useful references:

- The Weeds of National Significance website www.weeds.org.au/wons/chileanneedlegrass
- The Queensland Department of Industries and Fisheries website www.dpi.qld.gov.au.

TABLE 1 – HERBICIDE REGISTERED FOR THE CONTROL OF CHILEAN NEEDLE GRASS

Herbicide/situation	Rate	Registration status	Comments
Glyphosate (360 g/L) Boom spray	6 L/ha	PERMIT8421	Apply at start of flowering, before milky dough stage of seed
Glyphosate (360 g/L) Spot spraying	1 L product per 100 L water	PERMIT8421	
Fluazifop (212 g/L) e.g. Fusilade® Boom spray	1–2 L /ha	PERMIT8421	Do not graze or cut for stock feed for 21 days after application
Flupropanate (745 g/L) e.g. Tussock herbicide® Boom spray	1.5–3 L/ha	PERMIT8421	Avoid use in channels. DO NOT re-seed treated areas until at least 100 mm of leaching rain has fallen. Control will take up to 3–12 months depending on weather conditions and growth stage of plant. High rates will kill native grasses. Apply once per year. Treated areas should be monitored regularly for any regrowth.
Flupropanate (745 g/L) e.g. Tussock herbicide® Spot spray	100–300 mL per 100L water	PERMIT8421	
Flupropanate (745 g/L) + glyphosate (360 g/L) Spot spray Tank mix	200 mL + 150 mL per 100 L water	PERMIT8421	
Flupropanate (745 g/L) e.g. Taskforce Water Soluble Herbicide® Boomspray	1.5–3.0 L/ha		Registered Higher rates give better control on more mature plants. Avoid use in channels. DO NOT re-seed treated areas until at least 100 mm of leaching rain has fallen. Control will take up to 3–12 months depending on weather conditions and growth stage of plant. High rates will kill native grasses. Apply once per year. Treated areas should be monitored regularly for any regrowth.
Flupropanate (745 g/L) e.g. Taskforce Water Soluble Herbicide® Spot spray	100–300 mL per 100 L water	Registered	
The off-label permit (Permit number PERMIT8421) allows the use of various herbicides for the control of environmental weeds in urban open space, woodlands, roadsides, nature reserves and pasture. It is important to note that the treatment options outlined above are suggestions only and as such their effectiveness cannot be guaranteed.			
It is a requirement of the permit that all persons using products covered by this off-label permit comply with the details and conditions listed in the permit. Permit number PER8421 expires on September 30, 2009. NB. Read the herbicide label and Material Safety Data Sheet carefully before use and always use the herbicide in accordance with label directions.			

Fact sheets are available from DPI&F service centres and the DPI&F Information Centre phone (13 25 23). Check our website <www.dpi.qld.gov.au> to ensure you have the latest version of this fact sheet. The control methods referred to in this Pest Fact should be used in accordance with the restrictions (federal and state legislation and local government laws) directly or indirectly related to each control method. These restrictions may prevent the utilisation of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, the Department of Primary Industries and Fisheries does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.