Chilean Needle Grass
AWARENESS PROGRAMME

Chilean Needle Grass Ute Guide

Ministry for Primary Industries
Manatū Ahu Matua

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

MARLBOROUGH DISTRICT COUNCIL

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HURUNUI District Council

beef+lamb new zealand

TEECE FAMILY VINEYARDS NORTH CANTERBURY NEW ZEALAND

The Chilean Needle Grass Ute Guide was produced as part of the Chilean Needle Grass Awareness Programme. The Chilean Needle Grass Awareness Programme is funded by the Ministry for Primary Industries' Sustainable Farming Fund and the partners below. It is managed by Environment Canterbury with support from Canterbury's Chilean Needle Grass Pest Management Liaison Committee.

ISBN: 978-0-473-30918-3 (Print) and 978-0-473-30919-0 (PDF)

Published by: The Chilean Needle Grass Awareness Programme, under the management of Environment Canterbury, PO Box 345, Christchurch, 8140, New Zealand. December 2014. In consultation with Janine Holland Communications, Methven, New Zealand. Designed by Rosie Fenton, Christchurch, New Zealand. Printed by BNS Design & Print, Christchurch, New Zealand.

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Background

Chilean needle grass (*Nassella neesiana*) is an erect, tufted perennial grass of temperate South American origin which is considered an invasive pest plant in both Australia and New Zealand. It poses a significant threat to the sustainability of New Zealand's agricultural production industries and to the environment. Its agricultural impacts include reduced pasture and crop yields, reduced livestock carrying capacity as well as livestock health and welfare issues leading to a reduction in productivity and a decrease in value of infested properties. Environmentally, Chilean needle grass has a negative impact on biodiversity.

Chilean needle grass seed is spread by people, animals, vehicles, machinery and equipment as well as in soil, mud, plant matter and water and the plant has the potential to infest an estimated 15 million hectares nationwide. As such, it is important for landowners to adopt basic vehicle hygiene and farm biosecurity practices to minimise the risk of Chilean needle grass spreading onto their properties. It is also important for landowners to learn how to identify Chilean needle grass to facilitate early detection in the event that Chilean needle grass does spread to their property. Early detection allows for prompt containment and control of the infestation to prevent it from spreading elsewhere on the property.

Impacts of Chilean needle grass

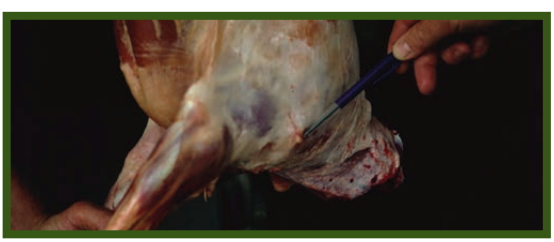
- Reduced pasture and crop yields.
- Reduced availability of stock feed due to unpalatability to livestock when seeding.
- Stock welfare issues. The seeds have a sharp, needle-like tip which can penetrate the skin and muscle damaging the hide and causing painful abscesses which can lead to downgrading of the carcass.
- Lambs are particularly vulnerable to seeds penetrating their eyes and causing blindness.

Chilean needle grass seed caught in a fleece.

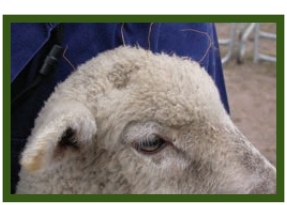
Chilean needle grass seed embedded in flesh.

Damage to a pelt caused by Chilean needle grass seed.
Photo above by G. W. Bourdôt, AgResearch

- A change in farming practices is often required as stock must be removed from infested areas from late October until March to avoid contact with seeds.
- Restricted sale of contaminated crops and stock.
- Seed reserves in the soil make it difficult and costly to control in the long term.



Damage to a carcass caused by Chilean needle grass seed.
Photo above by G. W. Bourdôt, AgResearch



Chilean needle grass seed caught in the wool near a lamb's eye.

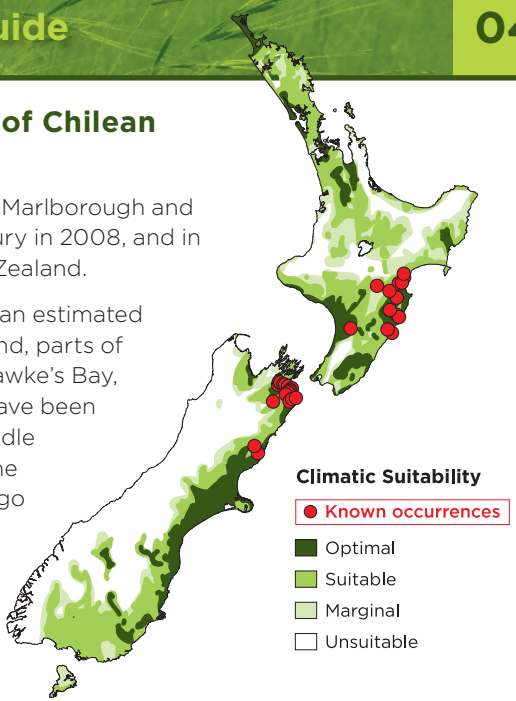
A wound in a horse's mouth caused by Chilean needle grass seed.

Current and potential distribution of Chilean needle grass in New Zealand

Chilean needle grass is currently widespread in Marlborough and Hawke's Bay. It was detected in North Canterbury in 2008, and in 2013 could be found on 3700 hectares in New Zealand.

Chilean needle grass has the potential to infest an estimated 15 million hectares nationwide. In the North Island, parts of the Northland, Auckland, Waikato, Gisborne, Hawke's Bay, Manawatu-Wanganui and Wellington regions have been found to be climatically suitable for Chilean needle grass infestation. In the South Island, parts of the Nelson, Tasman, Marlborough, Canterbury, Otago and Southland are climatically suitable.

Map redrawn from Bourdôt GW, Lamoureaux SL, Kriticos DJ, Watt MS, Brown M 2010. Current and potential distributions of *Nassella neesiana* (Chilean needle grass) in Australia and New Zealand. 17th Australasian Weeds Conference. Pp. 424–427.



Risk factors

There are several factors that contribute to the level of risk of infestation for individual properties within regions that are climatically suitable for Chilean needle grass infestation.

Pathways: The presence of potential pathways for the movement of Chilean needle grass seed onto a property increases the likelihood of seed being moved onto the property. Refer to pages 6 and 7 for more information.

Vehicle hygiene and farm biosecurity practices: The implementation of basic vehicle hygiene and farm biosecurity practices on a property can limit the potential pathways for movement of Chilean needle grass seed to the property. Refer to pages 10 to 13 for more information.

Habitat: Chilean needle grass is more likely to become established on properties where there is less competition from desirable pasture such as dry, hard hill country, areas with light soil, heavily grazed pasture and bare ground.

The properties at highest risk of Chilean needle grass infestation are those on dry, hard hill country with numerous potential pathways for the movement of Chilean needle grass seed onto the property and no vehicle hygiene or farm biosecurity practices in place to limit this movement.

Vectors and pathways via which Chilean needle grass is spread

Chilean needle grass seeds are poorly adapted for wind dispersal and tend to fall close to the parent plant.

More likely vectors include people, animals, vehicles, machinery and equipment as well as soil, mud, plant matter and water.

As such, potential pathways for the spread of Chilean needle grass seed include:

- On clothing and footwear.
- The movement of vehicles such as farm trucks, bikes, tractors, trailers, farm machinery as well as stock trucks and contractors' vehicles around and between properties.

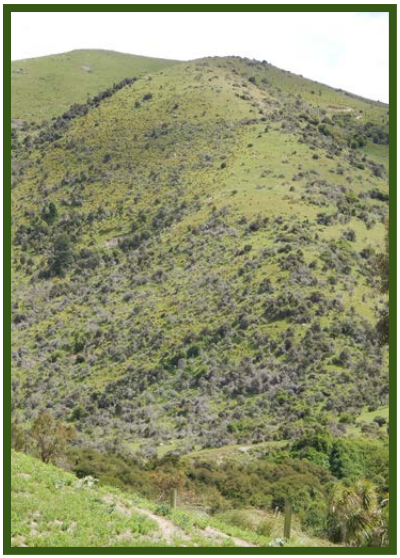
- On equipment such as shearers' handpieces.
- The movement of stock, particularly sheep, as well as farm dogs and horses around and between properties.
- Earthmoving activities.
- The purchase and distribution of contaminated seed, hay or crops.
- Waterways, particularly when in flood.

Where Chilean needle grass is likely to be found

Chilean needle grass has a preference for areas where there is less competition from desirable pasture species such as dry, hard hill country, areas with light soil, heavily grazed pasture and bare ground.

However, as seeds can be spread by people, animals, vehicles, machinery and equipment as well as in soil, mud, plant matter and water, it can also potentially be found:

- Along driveways and around farmhouses, stock yards, woolsheds and hay barns.
- Along vehicle access tracks and roadsides, particularly where stock have been moved or where there is room for vehicles to pull over.
- Along fence lines, around power poles and in any other place where stock may rub.
- In areas where contractors have been working.
- In parking areas either on-farm or in public places frequented by landowners, staff and contractors such as saleyards, pony clubs and sports grounds.
- In areas where earthmoving activities have been undertaken.
- Around vehicle and machinery wash-down areas.
- In newly sown pastures or crops.
- In paddocks where hay has been fed out.
- Alongside waterways, particularly after flooding.



What you can do to protect your property from Chilean needle grass

People, animals, vehicles, machinery and equipment as well as soil, mud and contaminated feed can all carry Chilean needle grass seed. By implementing some basic vehicle hygiene and farm biosecurity practices on your property you can minimise the risk of spreading Chilean needle grass onto your property.

Limit the number of potential entry points

Lock gates to restricted access areas.

Display biosecurity signs with clear instructions and contact details at all vehicle entry points to inform visitors of your biosecurity requirements.

Keep it clean

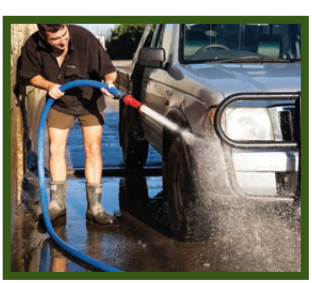
Put simple hygiene practices in place to prevent seed spread.

Make sure all staff, contractors and visitors check their vehicles, machinery, equipment, footwear and clothing for soil and seed before entering and leaving the property.

Use high pressure water to wash down dirty vehicles and machinery, sweep out vehicle interiors and use an air compressor to clean engine components and equipment such as shearers' handpieces.

Ideally, the clean down area should be hard-standing and have a sump to collect any wastewater. However if run-off cannot be avoided, it should be directed away from tracks, pens, yards, paddocks, crops and waterways. Areas around the clean down area should be checked regularly for Chilean needle grass.

Check farm dogs and horses for mud and seed before letting them on or off the property.



Ask before you buy

Source only certified seed or propagation material.

When purchasing stock, make sure the animals have not come from an infested property. If in doubt, contact your regional authority.

If using a stock truck ensure that it was washed down thoroughly after the last contracted job to reduce the risk of your stock picking up Chilean needle grass seeds during transit.

Consider quarantining stock in a designated holding paddock before letting the animals onto the rest of the property. The holding paddock should be checked regularly for Chilean needle grass.

Make sure any feed that you purchase has not come from an infested property. Again, if in doubt, contact your regional authority. Paddocks in which you have fed stock with purchased feed should be checked regularly for Chilean needle grass.

In the event that Chilean needle grass *does* spread to your property, early detection is critical. Learn how to identify Chilean needle grass so that any potential infestation can be contained and controlled to prevent it from spreading elsewhere on your property.

Learn how to identify Chilean needle grass and its seed

Ensure that all staff can identify Chilean needle grass and its seed.

Refer to pages 14 to 17 of this Ute Guide, watch the video on the Chilean Needle Grass Awareness Programme Facebook page at **www.facebook.com/chileanneedlegrass** or attend a field day in Hawke's Bay, Marlborough or Canterbury.

Be vigilant

Check pastures for Chilean needle grass in spring and summer while the plants are flowering and easier to identify. Keep an eye out year round for seed on your footwear and clothing as well as on your stock, farm dogs and horses.

Identification of Chilean needle grass

Chilean needle grass is an erect, tufted, perennial grass.

Its bright green leaves are 2–8 mm wide, flat and rough towards the base.

The plant is most easily identifiable from late October until March when it is flowering and seeding. During this period, distinctive aerial spikelets each consisting of a single floret are present in aerial inflorescences (open panicles).

The spikelets are each composed of two reddish purple-coloured glumes (outer husks) that contain a seed tightly enclosed in a hardened 8–10mm long lemma which extends into a long, twisted awn (tail) which is typically 60–70mm in length.

The reddish purple colour of the glumes fades to light brown as the seeds mature and the awns intertwine to form clusters of seed prior to detaching from the panicle.

Chilean needle grass is unpalatable to stock when flowering and seeding and can often be observed in paddocks during this period as ungrazed tufts of grass.

Refer to pages 28 and 29 for diagrams of some of the features of the plant that have been mentioned here.

From late October until March look for aerial spikelets with distinctive reddish purple glumes and long, twisted awns.

The reddish purple colour of the glumes fades to light brown as the seeds mature and the awns intertwine to form clusters of seed.

Photo by G. W. Bourdôt, AgResearch

Identification of Chilean needle grass

Chilean needle grass is more difficult to identify from April to early October when the plant is not flowering although the plant does have several diagnostic features which can be seen year round:

- Tufts of stiff, upwards-pointing hairs are present on both sides of the leaf at the base. These are evident when the leaf blade is pulled back from the stem.
- A short, membranous ligule can be seen, with the aid of a hand lens, as a thin piece of opaque tissue joining the leaf onto the stem.

A Chilean needle grass leaf blade can be pulled back from the stem to reveal tufts of stiff, upwards-pointing hairs at the base of the leaf and a short, membranous ligule joining the leaf onto the stem. Both are diagnostic features that can be seen year round.

Identification of Chilean needle grass seed

Chilean needle grass seeds are light brown and have a distinctive dart-like appearance. The seeds consist of a hardened 8–10mm long lemma (the "seed head") which extends into a long, twisted awn (tail) which is typically 60–70mm in length.

Short, backward-facing hairs run the length of the awn and assist the seeds in catching on passing animals.

At the tip of the seed head there is a hard, sharply pointed callus which can penetrate skin and muscle. The callus is barbed with backward-facing hairs which are longer than those along the awn. This makes the seeds difficult to remove once embedded in flesh. The corkscrew-like awn assists in propelling the seeds through the flesh.

Keep an eye out year round for light brown seeds with a sharp, barbed seed head and a long, twisted awn on your footwear and clothing as well as on your stock, farm dogs and horses.

Photo by G. W. Bourdôt, AgResearch

What to do if you think you have found Chilean needle grass or Chilean needle grass seed on your property

If you think you have found Chilean needle grass or its seed on your property or suspect that you have purchased contaminated seed, propagation material, stock or feed report it to your regional authority immediately.

Any control programme will need to be carefully considered and may include a combination of grazing, herbicide use, fencing off of infested areas, cultivation, pasture renewal and cropping in conjunction with the use of a grass herbicide.

Your regional authority will be able to assist you in developing a control programme that is tailored to your situation.

Grass species that are commonly mistaken for Chilean needle grass

Common needle grass (*Austrostipa nodosa*)

Similarities with Chilean needle grass:

- Common needle grass is a tufted grass.
- Its leaf blades are rough to the touch.
- Its inflorescences are open panicles.
- Each spikelet consists of a single floret.
- Its seeds are awned.
- The awns are bent or twisted.

Features that distinguish Common needle grass from Chilean needle grass:

- Common needle grass' leaves are 1mm wide and rolled.
- Its ligules are a hair-fringed membrane.
- Its spikelets are 1–130mm long.
- Its awns are 0–85mm long.

Refer to pages 28 and 29 for diagrams of some of the features of the plant that have been mentioned here.

Common needle grass when flowering.

A flowering Common needle grass panicle.

A Common needle grass panicle prior to seeding.

Grass species that are commonly mistaken for Chilean needle grass

Ripgut brome (*Bromus diandrus*)

Similarities with Chilean needle grass:

- Ripgut brome is a tufted grass.
- Its leaf blades are flat and rough to the touch.
- Its ligules are a hairless membrane.
- Its inflorescences are open panicles.
- Its seeds are awned.

Features that distinguish Ripgut brome from Chilean needle grass:

- Ripgut brome's leaves are 2–14mm wide.
- Each spikelet consist of 4–8 florets.
- The spikelets are 55–95mm long.
- Its awns are 30–60mm long and more or less straight.

Refer to pages 28 and 29 for diagrams of some of the features of the plant that have been mentioned here.

Ripgut brome when flowering.

A flowering Ripgut brome panicle.

A Ripgut brome panicle prior to seeding.

Grass species that are commonly mistaken for Chilean needle grass

Nassella tussock (*Nassella trichotoma*)

Similarities with Chilean needle grass:

- Nassella tussock is a tufted grass.
- Its leaf blades are rough to the touch.
- Its inflorescences are open panicles.
- Each spikelet consists of a single floret.
- Its seeds are awned.
- The awns are bent or twisted.

Features that distinguish Nassella tussock from Chilean needle grass:

- Nassella tussock's leaves are 0.2–0.6mm wide and rolled.
- Its ligules are a hair-fringed membrane (although the hairs are often only visible under a microscope with the membrane appearing smooth to the naked eye).
- Its spikelets are 15–40mm long.
- Its awns are 15–35mm long.

Refer to pages 28 and 29 for diagrams of some of the features of the plant that have been mentioned here.

Nassella tussock when flowering.

A flowering Nassella tussock panicle.

Nassella tussock prior to seeding.

Species comparison

	Chilean needle grass (*Nassella neesiana*)	Common needle grass (*Austrostipa nodosa*)	Ripgut brome (*Bromus diandrus*)	Nassella tussock (*Nassella trichotoma*)
Leaf blade width	2–8mm	1mm	2–14mm	0.2–0.6mm
Leaf blade shape	Flat	Rolled	Flat	Rolled
Ligule	Membrane	Hair-fringed membrane	Membrane	Hair-fringed membrane
No. of florets per spikelet	1	1	4–8	1
Spikelet length, including awns	60–90mm	1–130mm	55–95mm	15–40mm
Awn length	50–80mm	0–85mm	30–60mm	15–35mm
Awn style	Bent or twisted	Bent or twisted	More or less straight	Bent or twisted

Refer to pages 28 and 29 for diagrams of some of the features of the plant that have been mentioned here.

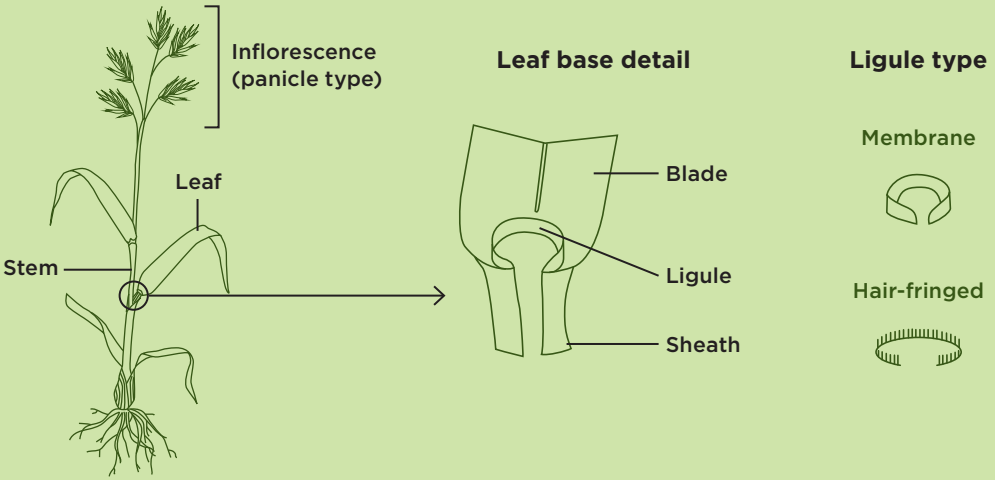
Seed comparison

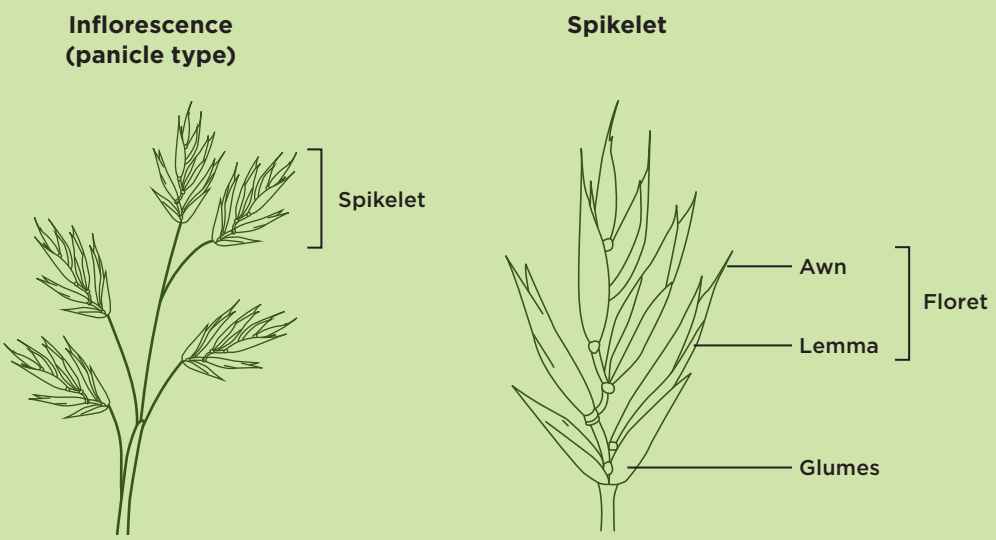
Immature seeds prior to detachment from the panicle. From top to bottom: Common needle grass seed, Chilean needle grass seed, Ripgut brome seed and Nassella tussock seed.

Mature seed after detachment from the panicle. From top to bottom: Common needle grass seed, Chilean needle grass seed, Ripgut brome seed and Nassella tussock seed.

Features of grasses

The following diagrams provide a generalised representation of some of the features of grasses that have been mentioned within this Ute Guide.





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