A Ute Guide to:

Chilean and Texas Needle Grass

Identification & Management

CARING FOR OUR COUNTRY

Campaspe Valley Landcare

Landcare Victoria

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CARING FOR OUR COUNTRY

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- National Best Practice Management Manual Chilean Needle Grass
- Management Guide Chilean Needle Grass

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Catchment Management Authority
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Chilean Needle Grass (Nassella neesiana) and Texas Needle Grass (Nassella leucotricha) are perennial, tussock-forming grasses native to South and Central America. Chilean Needle Grass is a weed of National significance in Australia. Both grasses are vigorous competitors in agricultural, natural and urban environments.

Chilean Needle Grass is a 'Restricted' noxious weed in Victoria. This means Chilean Needle Grass plants, or any product contaminated with the seed, cannot be traded or transported.

Texas Needle Grass is a declared weed in South Australia & Tasmania, but is not yet declared in Victoria. Despite this, it poses the same threat as Chilean Needle Grass in the Campaspe Valley region.

Photos: Charles Grech

The presence of Needle Grass can have a devastating impact on agriculture. It can severely reduce pasture productivity, contaminate crops and hay, and the needle-like seed can injure animals as it burrows into their skin and cannot be removed.

Seeds attach to hooves and paws of different animals.
Photos: Charles Grech

Chilean and Texas Needle Grasses grow in areas with annual rainfall of 50 – 1000mm.

The panicle seed is the main seed head. It develops during spring. A single plant can produce as many as 22,000 seeds (Gardener, 1998).

In addition to panicle seeds, Chilean Needle Grass also has stem and basal seeds, which allow it to develop a large and persistent seed bank.

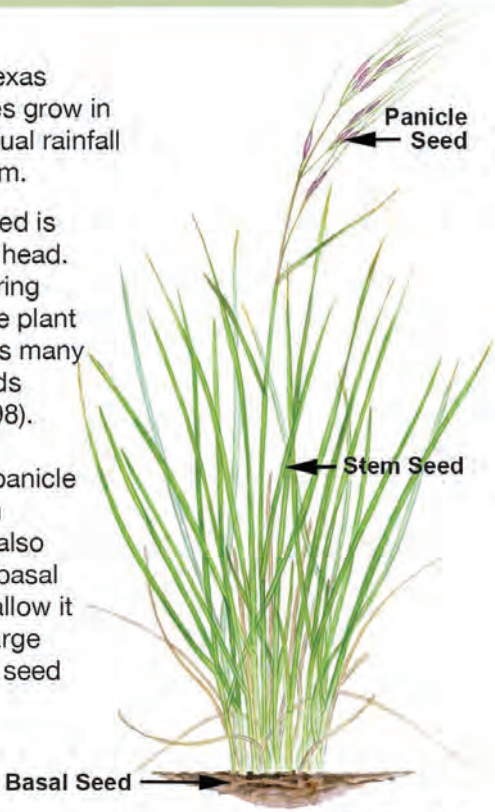
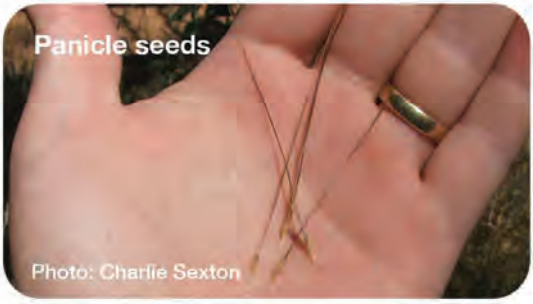


Illustration: Enid Mayfield

The panicle seed's ability to adhere to just about anything is the greatest cause of its spread. Seeds easily attach to animals (livestock, wildlife, domestic pets) and vehicles (utes, tractors, machinery). Seeds also spread easily in water, such as creeks and rivers. Flooding may cause extensive seed spread and it is important to monitor affected areas.



The stems seeds of Chilean Needle Grass form within the flowering stem after the panicle seeds. A single Chilean needle grass plant may produce 5-6,000 stem seeds (Gardener, 1998), which remain in the "straw".


Illustration:
Enid Mayfield

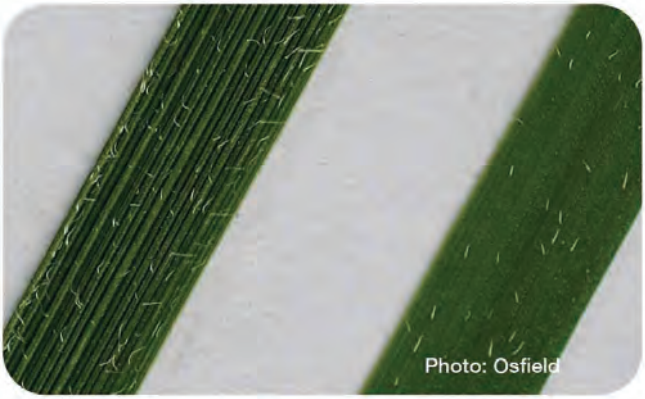
The **basal seed** forms very early in the plant's development, at the base of the tillers (in the crown, near the roots) and can mature within 12 months.

The best time to identify Needle Grasses is in spring when the panicle seeds are present. When seed heads are not present, the grass can be difficult to identify.
Both Chilean and Texas Needle Grass can easily be easily mistaken for other grasses including Great Brome (Bromus diandrus), Tall Fescue (Festuca arundinacea) Wallaby Grasses (Rytidosperma sp.) and particularly native Spear Grasses (Austrostipa sp.)

It is also advisable to learn how to identify Needle Grasses when they are not in seed, to enable other options for control. This can be done by checking known sites at different times of the year (a painted marker or GPS coordinates can be useful).

Chilean needle grass tussocks in winter.

When mature, the plant forms erect, robust tussocks up to 1 m in height and 1.5 m when flowering.



The leaves are 1-5 mm wide, up to 300 mm long, flat and feel quite 'firm'. The upper side (left) has visible parallel lines with tiny hairs giving a rough feel. Softer hairs on the underside (right), give a slightly downy appearance. The leaves can roll inwards when under stress.

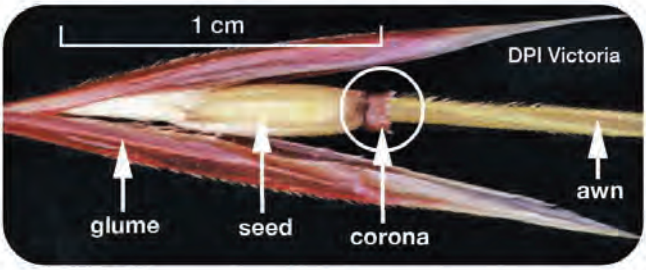
Flowering

When flowering in spring, the distinctive purple panicle seed-heads and long light green awns are clearly visible. They tend to hang to one side of the stem as if someone has combed them all neatly to one side.

Panicle Seeds
Chilean and Texas Needle Grasses have seeds that are attached to a long, twisted tail called an awn. Between the seed and awn is a raised collar called a corona.

Illustration: Enid Mayfield

The corona is the most important feature to look for when identifying Chilean and Texas Needle Grass.



Native Spear Grass seeds are very similar to Needle Grass seeds, but they do not have a corona. Spear Grass seeds are usually hairier than Needle Grass seeds also.

Chilean Needle Grass
Chilean Needle Grass seeds are 8-10mm long with an awn 60-90mm long. The corona is shorter than in Texas Needle Grass and it has short bristly hairs on it.

Texas Needle Grass
Texas Needle Grass seeds are 6-9mm long with an awn 35–60mm long. The corona is longer than Chilean Needle Grass and has longer hairs attached.

Native Spear Grasses
There are many different species of native Spear Grass found in our area. None of them have a corona, and they often have hairy seeds and dark coloured awns. Needle grass seeds are generally smooth and their awns are light green, turning straw-coloured.

Three Different Seeds

Texas Needle Grass Seed

Chilean Needle Grass Seed

Native Spear Grass Seed (one of many species).

Assess the site

- Map infestations
- Estimate density
- Check for new infestations in high risk areas (eg: high traffic areas, roadside drains, hay stack sites, flood limits)

Develop control plan

Prioritise sites and set achievable goals:

- **Prevent** spread of needle grasses to weed-free areas
- **Eradicate** small isolated infestations (See Bradley Weeding Technique to maximise effectiveness – page 11)
- **Contain** established and widespread infestations where eradication is not feasible

Implement control plan

Control infestations by using a range of integrated control techniques.

Monitor

Always follow up any control activities with periodic monitoring. In areas where needle grasses are thought to be eradicated, continue to monitor for several years.

Preventing Spread

Studies have identified that the movement of needle grass seeds are the major cause of spread.

- Always work in weed-free areas first
- Clean down trap points on slashers, mowers and tractors with a hearth brush for dry material, and scraper or high pressure water/air for solidified vegetation material, mud or dried dirt
- Carefully choose a clean down area and always use the same place to clean down
- Avoid working or having farm animals, including dogs, in infested areas when needle grass seeds are present (October to March)
- Note that seed readily sticks to wet machinery and vehicles
- Do not allow contractors on site unless clean and free from seed (consider using only WEEDSTOP accredited contractors)

Photo: Natasha Baldyga

Bradley Weeding Technique

- Begin control activities in least infested areas or around the edge of an infestation, as there is a very good chance that another species will colonise the area
- If you begin controlling in heavily infested areas then the spot will most likely be recolonised with needle grasses, because of the immense quantity of seed already present
- Avoid soil disturbance because needle grasses are aggressive competitors, so they will be the first to recolonise disturbed ground

The following control options are recommended and most commonly used:

Manual Removal
Manual removal by digging out needle grasses is the most effective eradication technique. It is best for new or very small infestations. Remove the whole plant to ensure removal of any basal or stem seeds that may be present. Destroy or dispose of plant material carefully to avoid seed spread.

Spot Spraying
Spot spraying is an effective control for small or isolated infestations especially in high value and sensitive areas. It is advisable to use a marker dye mixed with the spray solution to increase accuracy.

Spot spraying can be done using the herbicides glyphosate, flupropanate or a combination:

- Glyphosate – Provides a quick knock down but is not selective and can result in off target damage.
- Flupropanate – Residual root uptake herbicide that is marketed as a selective herbicide. Off target damage to other grasses (pasture and native) can occur. For best results, mark infestations in spring when visible, then spot spray in May to June. Check site the following spring and follow up if necessary.
- Combination of knockdown (glyphosate) and selective (flupropanate) in spring can prevent seed set on adult plant, slowly kill adult plant and prevent germination of seed for 2-3 years. Read the label to determine correct rate.

Caution:
Do not spray year in, year out with flupropanate (group J chemical) as resistance is highly likely to develop. If needle grasses reoccur, spot spray with glyphosate or physically remove for 2 years before applying flupropanate again.

Chemical Note:
Flupropanate is currently the only registered chemical for needle grass control in Victoria. Glyphosate and Fluazifop-p could also be used off-label. Ask your local chemical retailer for instructions on appropriate use, and always check registration status and label prior to use.


Photo: DPI Victoria

Herbicide-use training is highly recommended. Accredited training courses are run by organisations such as AusChem Victoria Inc. and TAFE colleges.

Slashing
Slashing should be carried out when needle grasses are flowering (see cover photo and page 7) to minimise panicle seed regrowth and reduce the risk of transporting viable seed. Needle grasses flower for approximately two weeks before the seed becomes viable, so there is very little time for slashing to be effective. As the timing of flowering varies from year to year, check frequently from mid-October to mid-November.


Photo: Charles Grech

Slashing needle grasses after flowering when seed becomes viable is not recommended. The tractor and slasher are highly likely to become contaminated with viable panicle seed. If slashing is conducted after seed set, use the highest standards of machinery clean down before leaving the site.

Slashing very frequently (at least every 2 weeks) may prevent panicle seed formation.

Be aware that in drought conditions even though needle grasses may appear depleted, once rains arrive it will be the first to bounce back and quickly out-compete desirable species.

Integrated control
A range of integrated control techniques are required for different land use situations and rainfall zones.

In pasture, use **rotational/crash grazing** to reduce seeding and competition from needle grasses, and to increase the effectiveness of chemicals. Set stocking favours needle grasses because other species will be preferentially grazed leaving needle grasses to prosper. Cattle are preferred over sheep, as seed does not attach as easily to cattle. Sheep should not be grazed at all once plants have started flowering.


Photo: Charles Grech

Before spring, **spot** or **boom spray** to prevent seed set and to kill existing plants. The choice of chemical and application method will depend on the situation.

Slashing or **cultivation** used in conjunction with spraying can improve the effectiveness of needle grass control.

Combine these techniques by **introducing a competitor** to any emerging needle grasses by sowing a crop, pasture or native grass species. Maintaining a healthy cover of desirable competing plants can prevent new infestations in clean areas and slow growth of existing plants. Ensure that a range of species are present to maintain cover throughout the year.

Wick wiping can be used if a height differential between the pasture and needle grasses occurs (for example, after light grazing).


Photo: Charles Grech

Spray topping and **burning** have also proven successful where land is not arable (for example, steep slopes, trees or rocky terrain).

Burning can be a useful management tool when integrated with other control options. Burning can provide a clearer indication of the level and pattern of infestation, which can then be controlled using spot spraying or manual removal.


Photo: Charles Grech

Quarantine livestock in holding paddocks if suspected to be contaminated with needle grass seed.

It is important to annually **monitor** all sites where control activities have been carried out for at least 10 years. Viable seed lasts in the soil for 6-8 years on average.

The Campaspe Valley Experience

Texas Needle Grass (TNG) is currently the grass weed of greatest significance in Barfold and some neighbouring districts.

As early as 1998 a Barfold farmer noticed an unfamiliar grass growing on his river flats and wondered if this new perennial would be a useful addition to the pasture he used for sheep & cattle grazing.

Later, after it had been identified as Texas Needle Grass by a government extension officer, it became clear that it would do much more harm than good.

Flooding events have worsened the problem considerably as the seeds are carried by water and plants establish well on river flats. After the floods of 2009/10, landholders previously unaware of TNG were confronted with significant infestations. Despite considerable effort and the use of a variety of approaches no one has succeeded in eradicating TNG on their land. Several of the larger landholders feel they can keep it under control in their paddocks, but it is rampant in the more inaccessible waterways. Carried by wind, sheep, cattle, feral animals, humans and machinery it continues to expand over paddocks and along roadsides.

Lessons Learned

The Campaspe Valley Landcare Group conducted a mapping exercise and a survey of 10 local landholders in April, 2015 to establish how widespread TNG is, and what kind of treatments people have used to control it. Both small and large-scale landholders who were aware of having TNG on their land responded. The sample includes experienced commercial farmers and non-farming landholders.

The comments of landholders reveal:

- A clear pattern of outbreaks along rivers & creeks, followed by expansion onto higher land of all kinds: fertile & infertile, hillsides and flats.
- It tends not to grow in shaded areas.
- General agreement that the young, green plants are moderately palatable to cattle but less so to sheep, which are also the most effective carriers of seed.
- None of the domestic animals can subsist on TNG alone, hough 'crash grazing' to reduce it before it sets seed is seen as a useful control measure – especially when used in conjunction with other methods such as spraying.
- Most emphasized that control was an ongoing process.
- Broad acre farmers had most success and were able to control even large infestations (some up to 90% cover) in paddocks where boom sprays could be used.


Field Day

- The optimism of broadacre farmers who had developed regimes of control was tempered by concerns about the cost of herbicides and time and effort involved.

- Those on smaller properties and those where infestations were inaccessible to boom sprays, were uniformly worried about the seemingly unstoppable nature of TNG's spread

- Every respondent agreed that TNG should be declared as a noxious weed. Some saw this as a means of raising awareness of Government and landholders who are unaware of the issue. It was also seen as a means to force more complacent landholders to take action to control outbreaks on their land.

Trial Results

In May 2014, the Campaspe Valley Landcare funded a field trial on arable, river front land at Barfold to study Texas Needle Grass (TNG) eradication. The trial was set up by Dr Charles Grech from Grassland Systems Pty. Ltd.


Photo: Charles Grech

Texas Needle Grass (Nassella leucotricha) covered 31% of the trial area. The aim of the trial was to start a control program without using the only registered selective herbicide, flupropanate (e.g. Kenock, Taskforce). After spraying with glyphosate, the area was sown to forage brassica at two different seeding rates, with & without fertilizer. The brassica was used to provide competition against TNG seedlings whilst also being tolerant to grass-selective herbicides that have been used to control needle grass growth during the cropping phase.

Even after germination problems in some areas and damage from slugs, the forage brassica grew very successfully and cattle were then allowed in to graze. TNG was hardly to be seen in the paddock after this. Since then, the cycle of spraying, sowing and grazing has been repeated.

At the field day during November 2014 landholders generally agreed that the Brassica had suppressed the growth of Texas needle grass at the trial site.

For further information about needle grasses in your local area contact:

Connecting Country
(03) 5472 1594

Mount Alexander Shire Council
(03) 5471 1700

Macedon Ranges Shire Council
(03) 5422 0333

State Government Department (Epsom Office)
03 5430 4444
Cnr Midland Highway and Taylor Street, Bendigo

Further Information:

National Best Practice Management Manual Chilean Needle Grass: www.weeds.org.au

Best practice information is available on the Connecting Country website:
www.connectingcountry.org.au

Many Landcare and Friends groups in the region have experience identifying Needle Grasses. Contact your local council or Connecting Country to find out the contact details for your nearest group.

Campaspe Valley Landcare

Proudly supported by the Victorian Government's Landcare Grants Program