Serrated Tussock Control

Integrated weed management using combinations of chemical, mechanical, physical and cultural techniques are critical for long-term control of serrated tussock.

Grazing Management

Stephenson

Strategic grazing (rotational) is Important to maintain good competition to out-compete serrated tussock.

Shelterbelts/windbreaks/rabbit/ mesh fencing

Peter Fullerton

Strategic placement of tree shelterbelts and mesh/rabbit fencing can reduce serrated tussock invasion from wind borne seeds.

Charles Grech

Fire

Charles Grech

A useful tool to maintain healthy native grasslands and can be used to strategically stop serrated tussock seeding.

Spot spraying

Steve Taylor

Careful spot spraying is an excellent serrated tussock control technique for most situations.

Broadacre spraying (boom and/or aerial)

Malcolm Campbell

Brigitte Verbeek

Suitable for medium to dense infestations. Ensure a calibrated rate controller is used. Be careful of off-target impacts.

Reduce the risk of serrated tussock herbicide resistance by practicing Integrated weed management and by rotating herbicides with different modes of action (ie. flupropanate and glyphosate).

Serrated Tussock Control

Chipping/Hoeing

Natasha Baldyga

Suitable for all situations for light to medium infestations.

Cultivation/Cropping

Charles Grech

Peter Fullerton

Suitable for rehabilitation of serrated tussock infestations on arable land.

Slashing

DPI Victoria

Strategic slashing can be used to prevent serrated tussock from seeding but will not kill the plant.

Mulching

Ken Menzel

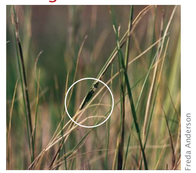
Mulching can be used to smother serrated tussock in difficult to control areas such as around rocks or fence lines.

Afforestation/Native bush

Tea-tree regrowth smothering serrated tussock

Tree or native bush regeneration can be used to shade out and out-compete serrated tussock in steep or non-arable situations.

Biological control



Freda Anderson

Research into natural enemies (Pathogens) to control serrated tussock is still under investigation.

Working together - consider your neighbours serrated tussock like your own!

Serrated tussock Best Practice Management Workshops

To assist the development of this brochure, eight serrated tussock best practice management workshops were conducted across Australia. Over 200 participants; representing farmers, shires, state and local government weeds officers, utilities, scientists, and environmental and natural resource management professionals were involved.

Some of the serrated tussock comments made by these participants are below.

Bathurst

- *New seed, 10 years of weed.*
- *For a dry season pasture should be no less than the depth of a beer can on its side and for a good season, no less than a can standing up.*
- *Hoe, hoe, hoe!*
- *If you don't follow up, then you are wasting your money.*
- *Control light infestations, contain the heavy.*
- *See a tussock, kill a tussock.*
- *Control serrated tussock when you first see it and be proactive in your management.*
- *Spot spraying - effective every day.*

Goulburn

- *A vigorous weed needs a vigorous response.*
- *Follow up, follow up, follow up.*
- *Never pass a tussock without action. Be proactive in your management of tussock.*
- *Focus management to continually improve the quality of pasture to promote the growth of desirable species and reduce the rapid emergence of tussock.*
- *Don't bite off more than you can manage.*

Canberra

- *If you keep at it, you can beat it.*
- *Mapping is important for planning control strategies and enables you to specifically target 'hot spots' of tussock.*
- *Focus tussock control on the most productive areas, to ensure income.*
- *Grazing management is a 'shift in managing animals to managing grass.*
- *Sheep and bad management, best spreaders I know.*
- *If you miss a tussock it will flower and seed.*
- *Can't beat a mattock.*

Attwood

- *It's a matter of having a mattock on the back of the ute*
- *Spot spraying—hard work paid off*
- *The most critical factor when hiring a contractor or doing broadacre spraying (air or ground) themselves is making sure that boom spray equipment has an automatic rate controller and that this is correctly calibrated*
- *Ground cover is critical*
- *Develop clear short term and long term objectives for your situation. A strategy should be adaptable to all seasons and multiple situations.*

Cooma

- *Failure to follow up is failure to farm for the future*
- *It's easy to blame someone else but it's a big cop out!*
- *Learn to live with serrated tussock. Be committed in the long term to control tussock*
- *Ownership of the tussock infestations is an issue.*
- *Pasture re-development is crucial for maintaining sufficient competition against tussock*
- *Rotating livestock allows your paddock to rest in an attempt to build up thicker groundcover.*

Bacchus Marsh

- *Plantations - prevents a lot of seed from blowing in.*
- *Fence off an infested area and make it a 'biodiversity block'.*
- *You aren't reducing the level of productivity because you are tackling unproductive land anyway.*
- *Chicken wire or rabbit fencing along the property boundary can stop tussock seed blowing in by catching seeds.*

Geelong

- *There is no shame in having it (serrated tussock); the shame is not doing anything about it.*
- *Incorporate fencing strategies into your overall management program.*
- *There are two types of properties—those that have it and those that are going to get it.*
- *[In our district] serrated tussock has changed farm management from grazing stock to cropping.*

Hobart

- *You've got to keep on controlling it.*
- *Identify it as soon as possible then implement control as soon possible.*
- *Chipping will cause some degree of soil disturbance, creating bare patches. Ensure you replace these patches with desirable species.*
- *One thing you have to be careful of is your serrated tussock hygiene.*
- *Enjoy a beer with your neighbour to break the ice and talk to them about serrated tussock management.*

Further Information

Further information on biology, management and identification can be found in the National Serrated Tussock Best Practice Management Manual from: **NSW DPI Bookshop** – ph: 1800 028 374 or email: bookshop@dpi.nsw.gov.au or by contacting the **VIC DPI Customer Centre** – ph: 136 186 or downloaded from: **www.weeds.org.au/WoNS/serratedtussock**

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Weeds of National Significance

National Best Practice Management Guide

Serrated Tussock

Current management and control options for serrated tussock (*Nassella trichotoma*) in Australia

State Government Victoria Department of Primary Industries
NSW DEPARTMENT OF PRIMARY INDUSTRIES
NATIONAL SERRATED TUSSOCK MANAGEMENT GROUP
Australian Government

Serrated Tussock Impacts

Agriculture

Serrated tussock is an invasive weed of pastures, having the potential to infest entire properties. It causes a greater reduction of pasture and grazing carrying capacity than any other weed in Australia. Its high fibre content and low protein content makes serrated tussock indigestible to stock and if livestock are forced to graze pastures containing only serrated tussock, the leaves can form indigestible balls in the rumen, causing a loss of condition and eventual death. Serrated tussock is costing agricultural industries annually more than $50 million in lost production and control costs.

Ryan Melville

Serrated tussock can invade grazing land, reducing carrying capacity.

Native Grasslands

Serrated tussock is a key threat to native grasslands that are one of Australia's most threatened ecosystems. Less than one per cent of their original extent remains in various stages of degradation throughout south-east Australia. Serrated tussock is invading these rare indigenous grassland remnants and its presence is a serious threat to many critically endangered native flora and fauna species within these grasslands. While serrated tussock is mostly a problem reducing the biodiversity values of native grasslands, it can also invade other environmentally significant areas such as dry coastal vegetation, grassy woodlands and sclerophyll forests. Common native grassland species being displaced include kangaroo grass (*Themeda triandra*), wallaby grasses (*Austrodanthonia* spp.), spear grasses (*Austrostipa* spp.) and native tussock grasses (for example, *Poa* spp.).

Charles Grech

Native grasslands are at risk of serrated tussock invasion.

Serrated tussock is an aggressive weed that affects agriculture, conservation and urban areas.

Urban situations

Serrated tussock can be commonly found invading roadsides, parks, neglected areas, railways, power line easements, reserves and sporting grounds of cities and towns. These areas can be a source of serrated tussock seed invasion to agricultural and environmental grasslands. Large build-ups of serrated tussock can also create increased fire hazards and its presence around Geelong in Victoria has increased the fire season by at least a month at each end of the season. The increased fire risk hazard is because:

- Mature serrated tussocks plants produce lots of dry highly combustible leaf material that can burn at extremely high temperatures. Serrated tussock fires have been known to create their own "fire wind storms", sending combustible material high up in the air to begin further spot fires.
- The tumbling nature of serrated tussock seed heads can lead to massive build up of wind blown combustible serrated tussock material under the eaves of homes creating fire hazards.

Serrated tussock can also become an undesirable grass invading sporting ovals and golf courses.

Simon Bonwick

Serrated tussock infesting an urban road side.

Bronwen Wicks

Serrated tussock can be a fire risk in situations such as this.

Distribution in Australia

Serrated tussock originates from South America and was first recorded in NSW in 1935, Victoria in 1954 and Tasmania in 1956. It has now spread to infest 860,000 ha of NSW (medium to high density) with scattered infestations over an additional 1.2 million ha. Victoria has 130,000 ha infested by serrated tussock but 45,000 ha of this area is now under long term control through a concerted control program facilitated by the Victorian Serrated Tussock Working Party and implemented by the Victorian Department of Primary Industries. Tasmania has maintained a strong serrated tussock management campaign but still has approximately 1,700 ha of infestations.

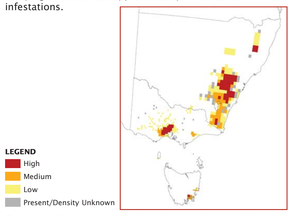


Figure 1: Current distribution of serrated tussock in Australia.

Potential distribution in Australia

Using the climate modelling system CLIMATE®, the potential distribution of serrated tussock, based on the climatic parameters of current infestations in Australia, has been estimated at 32 million ha.

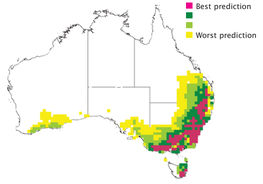


Figure 2: Potential distribution of serrated tussock in Australia.

Life Cycle and Preferred Habitat

Key features of serrated tussock life cycle include:

- it is C_3 (winter active/summer dormant) perennial drought tolerant exotic tussock grass that can grow on all soil types and will often be found in soil where there is little nutrition and/or moisture.
- readily invades bare areas of ground such as overgrazed pastures and cultivated situations.
- only reproduces by seed - producing tens of thousands of small seeds on large structural panicle stalks dispersed mostly by wind but seed also spread by animals, vehicles/machinery, water, soil movement, fodder and by other human activities.
- once flowering is initiated, seed-set will occur within 8-10 weeks with most seed germinating during Autumn.
- seedlings are slow growing and vulnerable to competition by other more vigorous growing species
- individual plants can live for many years
- able to quickly respond to changing environmental conditions. For example, may flower and set seed within 12 months (known in Victoria) or may take as long as 3 years in drought and low fertility situations.
- seeds can decay rapidly in the seedbank providing land managers some comfort knowing that if you prevent serrated tussock from seeding, the viability of the seeds in the soil are also declining rapidly.

A general indication of the lifecycle and growth pattern of serrated tussock throughout the year is shown in table below. Please note that the timing of different stages can vary, being earlier or later, depending on rainfall, temperature and soil fertility.

		SPRING			SUMMER			AUTUMN			WINTER		
State		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug
All	Germination												
All	Bleaching due to frost												
Vic / Tas	Flowering												
Vic / Tas	Seed formation												
Vic / Tas	Seed drop												
NSW / ACT	Flowering												
NSW / ACT	Seed formation												
NSW / ACT	Seed drop												

= general pattern of growth; = growth pattern under favourable conditions#.

= Favourable conditions generally mean high soil fertility and following periods of significant rainfall or soil disturbance.

Identifying Serrated Tussock

Identification of grasses can be difficult, especially when the seed head is not present. Serrated tussock can be confused with a number of native tussock grasses as well as other introduced *Nassella* species. Serrated tussock is easy to misidentify, so if in doubt, seek expert advice.

Key identifying features of serrated tussock:

- tussocky grass to 60 cm tall
- Serrated tussock is a plant that changes colour with the seasons. Plants appear purple when flowering in late spring / early summer.

Bronwen Wicks

- Once the seed ripens in late summer, flower heads change to a golden brown colour with a light green tussock base.
- Plants remain green during summer, when other grasses have usually browned off.

David McLaren

Key identifying features of serrated tussock:

- tussocky grass to 60 cm tall
- thin, tightly rolled, hairless leaves with very fine serrations
- white hairless ligule
- white swollen leaf bases
- purple tinge to flower heads, later turning golden as the seeds ripen
- weeping flower heads that break off at maturity
- difficult to pull from the ground, even when small.

- Some older leaves may die and remain beige on the plant for several years. Younger plants are a bright green colour while older plants may be a light green colour when recovering from burning or slashing.

Charles Grech

- In frost prone areas, the tussocks are bleached a golden yellow colour by frost during late autumn and winter.

Malcolm Campbell

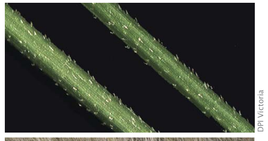
- Serrated tussock has white swollen leaf bases (like a shallot) while the tips of old leaves often have a bleached fawn tip.

Graeme Pritchard

- The flowering stems weep over almost touching the ground. Weeping flower heads break off at maturity and are easily dispersed by wind tumbling along the landscape.

Mitchell Michelmore

- The leaves are thin, tightly rolled, hairless with very fine silica serrations that can be felt if the finger and thumb are carefully pulled along the leaves from the tip towards the base in a downwards motion.



DPI Victoria

Chelsea Wardrope

- Serrated tussock has a dense fibrous root system and is difficult to pull from the ground, even when small.

Graeme Pritchard

- Serrated tussock has small (1 mm long) white hairless ligule. The ligule is a membranous or hairy appendage that occurs at the junction where the leaf separates from the stem. To find the ligule, trace down a leaf to its junction with the stem. Carefully separate and bend the leaf back. If the grass has a ligule, a small, membranous or hairy flap will protrude. The ligule of serrated tussock has a rounded tip, never hairy and protrudes vertically at the junction of the leaf blade and the leaf sheath and is continuous with the leaf sheath margin. Similar native grasses have smaller, differently shaped or hair-fringed ligules.

DPI Victoria

- Its seeds are 1.5-2 mm long and enclosed in two reddish brown or purple bracts (glumes), 6-10 mm long which taper gradually to a point. The seed has a tuft of short white silky hairs at one end and a long, twisted awn at the other end. The awn is attached to the seed off centre and its length varies. In NSW, ACT and Tasmania, the awn length is about 25 mm long. In Victoria the awn cane can be up to 35 mm long in length.

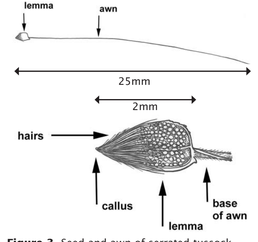


Figure 3. Seed and awn of serrated tussock.

Serrated tussock leaves roll smoothly like a needle when rolled between the index finger and thumb. Native grasses will feel like they have flat edges.