

Reducing the current risk of tussock expansion

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Tussock germination June to spring '05

Research indicates that serrated tussock germinates mainly in autumn but can germinate throughout the year given adequate soil moisture and temperature¹. When they first germinate tussocks are only one fine leaf blade and are difficult to see. However, the seedling stage is the weakest part of the lifecycle and the most effective time for preventing expansion. In the coming months, germinating seeds may have little competition for soil moisture, nutrients and light.

The best chance of preventing further spread of infestations is to promote rigorous competitive pastures ...

Established plants

The small plants observed in pastures have probably germinated last year and have survived, or have germinated with recent rainfall or earlier this year.

Serrated tussock is drought resistant, survives well in low fertility soils and isn't palatable to stock. These factors combined mean that tussocks aren't under the same pressures as surrounding competitive plants. The result in a grazed pasture during drought is that desirable plants are reduced and the serrated tussocks remain.



Therefore, tussocks are often the only plants still highly visible during drought.

Maintain a rigorous mechanical or chemical control program to prevent growth and seeding ...

The race to dominance

The composition of pastures after the drought will be determined by:

- the species composition of the ***soil seed bank***
- the proportion of ***surviving desirable grasses***
- resting and grazing regime
- soil fertility.

Soil seed bank

With appropriate grazing and fertiliser phalaris and perennial ryegrass (*Lolium perenne*) will outgrow germinating serrated tussock seedlings¹. Phalaris (*Phalaris aquatica*) and perennial ryegrass produce 6 and 9 times respectively, more foliage than serrated tussock in the 6 months after germination¹. Take into account that perennial ryegrass is quick to establish but is less persistent than phalaris, cocksfoot and tall fescue.

Surviving desirable grasses

Plants surviving the drought obviously have an advantage over germinating tussocks, as they are already established. You can promote this advantage by resting pastures from grazing until the plants regain some leaf area, and by appropriate application of fertiliser.

Pastures re-shoot using carbohydrate reserves located in the roots. A rest from grazing allows leaves to photosynthesise and replenish carbohydrate reserves, which it will use for further growth.

It may be difficult to tell whether grass is still alive until after some rainfall when green shoots appear. For instance, the native Weeping Grass (*Microlaena*) has underground horizontal stems that might shoot some distance from the original plant. Phalaris has a slightly spreading growth habit and recovers from underground buds.

Where native grasses still exist on shallow soils and steeper slopes they need to be carefully managed as they are irreplaceable.

After extended drought it is unlikely that many landholders will have the recommended 70-90% groundcover across the property. Seedlings are out-competed in two ways: competition at germination; and soil moisture over the following summer².

***Assess the proportion of groundcover –
concentrate on rehabilitating areas at the greatest risk of invasion.***

Pastures that don't recover

On pastures that have less than 70 -90% cover you can lower the risk of tussock establishment by sowing desirable introduced grasses and sub-clover² from autumn through early spring, as soon as there is adequate soil moisture. Adequate soil moisture is estimated to be 15-20cm depth of visibly damp soil. Seek advice to select sub-clover that will provide good ground cover through spring to compete with germinating tussock seedlings².

Seek specific advice to select and establish grass species suitable to your soil types and management aims; and on pasture establishment principles such as the mix of species, kilograms of seed per hectare, sowing time, fertiliser rates and grazing management. Direct drilling seed into existing pastures will preserve the bulk of the surviving plants. You might consider direct drilling through a local contractor if you don't have the necessary equipment.

Control tips

Keep in mind that flupropanate needs 30-35mls of rainfall to wash into the soil and be taken up by the roots to kill the plant. To prevent seeding in early summer you will need to apply flupropanate at least 6 months before and have adequate rainfall. To avoid any residual effect from the herbicide on seeds sown wait for 100ml leaching rain and check stock withholding period on the herbicide label.

Flupropanate will kill Weeping Grass (*Microlaena*), Wallaby Grass (*Danthonia*) and retard the growth of Kangaroo Grass (*Themeda*). Glyphosate (eg. Roundup[®]) will **also kill most grasses** that it comes into contact with.

In good growing conditions glyphosate will 'brown out' tussocks within two weeks and prevent seeding. Glyphosate breaks down quickly in the soil, therefore pasture or crop can be sown within weeks. Glyphosate will work less effectively if tussocks are stressed by conditions such as lack of soil moisture or frosts.

Where tussocks are scattered, spot spraying with hand-held equipment tends to be the method that is least destructive to desirable competition. To be effective you need to make sure you apply the right amount of chemical and direct the nozzle straight at the plant. It will soon be a legal requirement for all chemical users to be accredited through a course (run by DPI, TAFE and other rural training providers).

Using a hoe to dig out and remove plants is also effective where tussocks are scattered and you wish to preserve existing competition. It is important to sever the whole plant top from roots remaining in the soil. It is also recommended to re-sow the hole with a sprinkle of competitive seed mix and fertiliser.

On steep country or on medium to heavy infestations you might consider applying chemicals with a boom spray drawn with a 4WD or tractor, or by plane or helicopter. Often local councils will coordinate aerial spraying programs and can recommend spray contractors with appropriate equipment.

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1. Campbell, M.H., Vere D.T. (1995), *Nasella trichotoma (nees) Arech.* In *The Biology of Australian Weeds*, Volume 1, Melbourne: R.G. and F.J. Richardson, pp. 189-202.
 2. Badgery, Warwick (2004), PhD Thesis or Annals of Botany paper.