



# Grasses for Dryland Dairying

## Tall Fescue: Establishment

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*This Agnote provides information on Tall Fescue establishment and its suitability for dryland dairying areas in Victoria.*

### Introduction

Tall fescue (*Festuca arundinacea* Schreb.) is a perennial temperate grass (C3) native to Europe and North Africa but highly suited to livestock grazing systems in southeast Australia. There are two main types of Tall fescue; Continental has variable winter activity, and Mediterranean which is summer dormant. Tall fescue requires good soil fertility, warm soil temperatures, adequate moisture and effective weed management in order to establish successfully.

### Paddock selection

Paddock selection for tall fescue establishment is critical for long term persistence and optimum production. Low soil fertility reduces success of establishment and persistence. Paddocks chosen for tall fescue establishment should ideally have clay or clay loam texture, good soil fertility and a low weed seed bank. Tall fescue is more tolerant than ryegrass of waterlogged soils but prolonged water-logging is to be avoided. If Continental cultivars are being established, paddocks need to be able to retain moisture in the spring and summer to allow for summer active growth.

Specifically, soil acidity should be no less than 4.9 pH<sub>Ca</sub> and aluminium no more than 2% at sowing. Liming to reduce acidity and aluminium levels should be addressed 6-12 months before sowing. Tall fescue is more tolerant of salinity than ryegrass and phalaris. Soil salinity levels should be less than 10 dS/m.

Nitrogen (N) fertility is also important for tall fescue establishment. N can be supplied through the introduction of legumes into the pasture mix or, more reliably through applications of N fertiliser. In lighter soil types such as sandy loams and granite derived soils, where N may be leached, or on soils where legume growth is poor, tall fescue production will most likely benefit from applications of N fertiliser.

Prior to tall fescue establishment, paddocks selected should be soil tested and fertiliser applied to achieve the

target levels required. Target soil fertility levels will depend on soil type, stocking rate, phosphorus sorption characteristics of the soil and production levels, but a guide to these levels is provided in Table 1. If soil fertility is not at the required target levels, tall fescue can still be sown but increased maintenance fertiliser will be needed until target fertility levels are reached. The target levels must then be maintained with fertiliser applications.

**Table 1. Target soil fertility levels for tall fescue.**

Farm type	Phosphorus (Olsen P, mg/kg)	Sulphur (SO <sup>2-</sup> <sub>4</sub> , mg/kg)	Potassium (Colwell K, mg/kg)
Dairy	20-30	15	250

### Paddock preparation

As tall fescue seedlings are slow to establish and exhibit generally poor seedling vigour, paddock preparation to eliminate weeds is critical to minimise competition during the establishment phase. Annual cropping with weed management for one or two years will adequately prepare the paddock for tall fescue establishment. There are two ways to prepare a paddock for tall fescue establishment.

#### Cultivated seedbed

For conventional sowing, a finely prepared seed bed is desirable. The seedbed should be firmed with a roller prior to sowing to achieve accurate sowing depth and the retention of moisture. Rolling should be avoided if soil moisture causes loss of structure (plasticine texture or crusting of soil surface).

#### Direct drilled

Tall fescue can be direct drilled provided that weed control, especially for annual grass weeds, has been achieved. This is usually done with chemical herbicides prior to sowing to achieve a complete kill.

Another weed management strategy that can be used in dryland dairying and in a direct drilling situation involves growing a summer crop to deplete the weed seed-bank. This usually involves a spray, cultivate and sow sequence, or cultivate and sow which reduces weed competition. This is a necessary operation with pastures containing over 20% bent-grass for example. A re-spray after the summer

crop, just prior to sowing of the fescue, may be necessary to eliminate any potential competition to the new seedlings. Weed competition is the most significant cause of failure in fescue establishment, due to its slow early growth.

### Sowing time

Tall fescue establishment should occur when the soil temperature is at least 12° - 15°C at 10cm depth, provided there is adequate moisture and paddocks are trafficable.

Research has shown that choice of autumn or spring sowing depends on location, soil type and season. In dryland dairying, autumn sowing is preferable as soil moisture and temperature conditions are generally favourable. Autumn sowing allows the maximum time available for establishment before the onset of hot, dry summer weather. This is particularly important for the Mediterranean cultivars that are summer dormant.

In some areas autumn sowing of tall fescue can be problematic because of low soil temperatures and moisture variability but these conditions may not be present in all years. Where these conditions occur, the advantages of a spring sowing of the Continental cultivars (summer active) of tall fescue include better weed management, full profile of soil moisture and rising temperatures. The disadvantages of a spring sowing may include paddock trafficability, especially in cultivated seedbeds, late germinating weed species and a drying soil profile.

### Seedbed preparation and sowing

The seedbed must be fine and contain clods no larger than 2cm in diameter. The soil should be moist, level and firm. Soil is “firm” when all of your weight is placed on one heel and the impression left in the soil is less than 25mm. Tall fescue establishment is best achieved when the seed is sown into the soil, no deeper than 10mm. This is best achieved using tyned seeders, however broadcasting is an option.

### Sowing machinery

The best placement of the seed in cultivated seedbeds can be achieved with tyned seeders that have accurate depth control. In direct drilled seedbeds, machinery such as a Duncan Multiseeder® triple disc drill or inverted T drill can be used.

Alternatively, seed can be broadcast on to the soil surface, using a conventional seeder to meter out the seed evenly across the paddock. To achieve a better distribution of seed, seed quantity can be split and two passes of the paddock made. Broadcast seed then needs to be rolled to ensure seed/soil contact. Broadcasting seed from a fertiliser spreader, without attention to depth, covering or firming is not recommended and will result in poor seedling emergence.

### Sowing depth

Tall fescue seed should be sown at a depth of **10 mm** into a firm, moist seedbed. The seed needs to be covered with a layer of moist soil and firmed using a roller to achieve

optimum seed-soil contact. Sowing seed too deeply can result in poor emergence, and a longer time period for emergence, which provides opportunities for weeds to establish. Conversely, sowing seed too close to the surface can result in poor seed-soil contact and seed desiccation.

### Fertilisers at sowing

Soil fertility tests should take account of available phosphorus (P), potassium (K), sulphur (S) and N as elements most important for successful establishment. Target fertility levels for P, K and S are listed in Table 1.

In cultivated seedbeds, fertiliser can be applied and worked in immediately before sowing. If direct drilling, fertiliser can be applied to the surface prior to sowing. Delays between applying fertiliser and sowing may result in nutrients being locked up in the soil profile.

Some fertiliser should also be banded with the seed in the sowing operation to ensure the best possible start for the germinating seedlings.

N fertiliser should be applied to promote tillering and root growth. The amount of N fertiliser used at sowing will depend on the previous history and clover content of the paddock but should not exceed 20 kg N/ha if in contact with the seed. A complete fertiliser with both N and P and other nutrients, if required, is recommended.

### Sowing rates

Tall fescue has a larger seed in comparison to other pasture grasses such as phalaris, ryegrass or cocksfoot (Figure 1). It therefore needs to be sown at higher rates to achieve similar pasture densities. If tall fescue is being sown without any companion species, sowing rates should be at least 20 kg/ha (range 20-30 kg/ha). In lower rainfall areas where Mediterranean cultivars might be chosen, sowing rates of between 10-20 kg/ha can be used.



*Figure 1. Tall Fescue seed on the right is much larger than phalaris seed on the left.*

### Companion species

Tall fescue can be sown in mixtures with other pasture species. Clovers, including white, subterranean, red, and strawberry are all suitable companion legume species to tall fescue. All suggestions are for bare seed and legume rates should be increased to take account of inoculation and lime coating.

### 1. Suggestions for mixtures with either Continental or Mediterranean tall fescue

- Tall fescue sown at 20-30 kg/ha with either red clover at 3-5 kg/ha, white clover at 3-4 kg/ha, or strawberry clover at 1-2 kg/ha;
- Tall fescue sown at 20-30 kg/ha with either chicory at 1 kg/ha or plantain at 1 kg/ha.

### 2. Suggestions for mixtures with Continental type tall fescue only

- Tall fescue sown at 20-30 kg/ha with subterranean clover at 2-4 kg/ha;

### 3. Suggestions for mixtures with Mediterranean type tall fescue only

- Tall fescue sown at 12-20 kg/ha with subterranean clover at 6-8 kg/ha.

Lucerne can be sown with Continental tall fescue in areas where there is good summer rainfall and a low chance of moisture stress. In drier areas, lucerne can compete effectively against tall fescue for available moisture.

Using other pasture grasses in mixes with tall fescue needs to be done with caution as most other grass species have the potential to dominate tall fescue by establishing more vigorously and/or by being less palatable once the fescue is established. Suitable grass species for companion planting with tall fescue include cocksfoot (0.5 kg/ha) and phalaris (1 kg/ha).

Ryegrass will compete vigorously with tall fescue if sown together and effective grazing management for both species is difficult to achieve, particularly in spring.



*Figure 2. Flecha Max P Mediterranean tall fescue emerging with lucerne.*

## Pests

Pest precautions recommended for grass establishment in specific districts should be followed as a first step.

Tall fescue is susceptible to damage from red-legged earthmite and pasture cockchafer in the establishment phase. Both pests are reduced through soil cultivation and red-legged earthmite populations can be managed using the Timerite® package available at [www.timerite.com.au](http://www.timerite.com.au). Controlling earthmites just prior to sowing and close monitoring for damage of the establishing pasture is also

advised. Slugs may be a problem in protected drill rows such as the slots from direct drilling.



*Figure 3. Black-headed cockchafer (left) and red-legged earthmite (right) can affect pasture establishment.*

## Grazing during establishment

It takes at least 1-2 years for tall fescue to establish properly and grazing management within this period is critical. Plants should be allowed to reach at least 10 cm in height and be firmly rooted before any grazing occurs. If the plant can be pulled out of the ground, grazing should be delayed.

On dairy farms, high stocking rates of heifer calves (50 +/ha) when the soil surface is firm, is recommended for short periods (1-2 days) for the first grazing. The tall fescue should have a residual height of 5 cm after grazing, and then be left to re-grow to 10-12 cm.

In the first year tall fescue pastures should be maintained at 6-10 cm through rotational grazing. Mediterranean tall fescues become dormant over the summer months and the dry herbage can be grazed during this period and then left to recover in the autumn when tiller development occurs.



*Figure 4. Flecha Max P tall fescue one year after establishment.*

## Further reading

- Anon. Tall fescue on-line monograph. <http://forages.oregonstate.edu/is/tfis/monograph.html>.
- Avery, A. (2003) Small Farm: Pastures. Victorian Agriculture Note AG1059, ISSN 1329-8062.
- Borg, D. (2005) Pastures for discharge areas. Victorian Agriculture Note AG0386, ISSN 1329-8062.

- Charles, G.W., Blair, G.J. and Andrews, A.C. (1991) The effect of soil temperature, sowing depth and soil bulkdensity on the seedling emergence of tall fescue (*Festuca arundinacea* Schreb.) and white clover (*Trifolium repens* L.). *Australian Journal of Agricultural Research*, Vol. **42**: 1261-1269.
- Charles, G.W., Blair, G.J. and Andrews, A.C. (1991) The effect of sowing time, sowing technique and post-sowing weed competition on tall fescue (*Festuca arundinacea* Schreb.) seedling establishment. *Australian Journal of Agricultural Research*, Vol. **42**: 1251-1259.
- Easton, H.S., Lee, C.K. and Fitzgerald, R.D. (1994) Tall fescue in Australia and New Zealand. *New Zealand Journal of Agricultural Research*, Vol. **37**: 405-417.
- Hare, M.D. (1994) Autumn establishment of three New Zealand cultivars of tall fescue (*Festuca arundinacea* Schreb.) for seed production. *New Zealand Journal of Agricultural Research*, Vol. **37**: 11-17.
- Milne, G. (2001) Tall Fescue Guide. Pacific Seeds Pty Ltd., Toowoomba, Queensland.
- New South Wales DPI (2004), Tall fescue. New South Wales Agnote DPI-285.

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