



Grasses for Dryland Dairying Tall Fescue: Management for Production and Persistence

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This Agnote provides information on Tall Fescue management for production and persistence in 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 and well-planned grazing management for optimum production and long term persistence. Experiments conducted by the University of Melbourne have shown that tall fescue persists longer and produces at least similar milk production to perennial ryegrass. This publication refers to modern tall fescue cultivars, which are suitable for grazing purposes. For information regarding the influence of endophytes in tall fescue, please refer to Agnote AG 1241.

Tall fescue growth characteristics

Tall fescue has three growth characteristics that allow it to regenerate and persist. Firstly, it produces **tillers** although at a much slower rate than perennial ryegrass. These tillers are larger than perennial ryegrass tillers and survive for longer. Tall fescue tillers maintain about 2.5 live leaves at any one time whereas perennial ryegrass can maintain 3 live leaves. This growth characteristic dictates grazing management such that if leaf number is being used as a grazing management tool, allow for at least 2-3 leaves per tiller before grazing tall fescue.

Secondly, in spring tall fescue plants have leaf axillary buds that produce what is known as **'daughter' tillers** when reproductive stems are also being produced. Daughter tillers are important for summer production but they will only develop if the reproductive stems are removed before flowering. Some axillary buds that do not form daughter tillers will develop into rhizomes the following autumn.



Figure 1. Flecha Max P tall fescue plant showing tiller growth.

Thirdly, tall fescue plants produce **rhizomes**, or underground stems, that have the potential to produce new plants. Rhizome growth begins in the second autumn after sowing; allowing longer spells between grazing in the autumn will encourage rhizome production and increase tall fescue density.

Grazing during establishment

Grazing management during the establishment year is critical and should consider the requirements of the plant to develop a strong root system for future persistence.

Plants should be allowed to reach at least 10-12 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. If the farm has a Johnes management program in place then any animals grazing dairy pastures should be over 12 months of age (eg. yearlings). The tall fescue should have a residual height of 5 cm after grazing, and then be left to re-grow to 10-12 cm. This pattern of short grazing periods followed by rest periods for recovery should continue until spring when temperatures rise and moisture declines.

It is not necessary to allow tall fescue to set seed in the first year and establishment is generally better if the sward is rotationally grazed according to the pattern above.

Mediterranean tall fescues can produce around 1-2 t DM/ha of pasture during winter and spring seasons but become dormant with a rise in temperature over the summer months. During summer the dry herbage can be grazed during this period and then left to recover in the autumn when tiller development occurs.

Maximum tillering occurs in tall fescue during the autumn period. Tillering can be increased by appropriate grazing management during the first autumn after the establishment year. Maintaining a rotational grazing pattern where plants are not grazed below 5-6 cm and grazing when they reach 10-12 cm will optimise tillering opportunities. If plants can be pulled out of the ground, grazing should not occur.

Table 1. Tall fescue grazing management guide for dryland dairying (based on G. Milne, Tall Fescue Guide)

Period/conditions	Recommended management
First grazing	When plants are 10-12 cm tall, graze for 1-2 days with heifer yearlings at high stocking rates (50+/ha), residual height should be 5 cm.
First spring	Maintain grass between 5-12cm by frequent rotational grazing.
First summer	When growth slows due to dryness and higher temperatures, remove stock until re-growth to 12 cm occurs.
First autumn after sowing	Keep tall fescue between 5-10 cm after the autumn break.
Vegetative phase (autumn to early spring)	Rotationally graze between 5-15 cm.
Heading phase (September to November) (August to October for early cultivars)	Keep tall fescue short between 2-4 cm. High stocking rates may be needed.
Drought	When tall fescue growth has almost stopped, remove stock until re-growth of 12 cm has occurred following rainfall.
Wet weather	Remove stock from paddock when soils are wet to prevent pugging damage.

Grazing mature tall fescue pastures

Grazing management for established tall fescue pastures includes optimising palatability and retaining plant density for long term persistence. Optimum palatability of tall fescue is achieved by maintaining the plant in the vegetative phase and controlling stem growth in spring through appropriate grazing management. This involves understanding the growth cycle of tall fescue and grazing

to encourage vegetative growth when seasonal conditions allow. During autumn and winter (non-reproductive phase) tall fescue should be grazed in the range of 5-15 cm. In spring (reproductive phase), tall fescue should be grazed in the range of 3-10 cm (when pasture mass reaches around 2-3 t DM/ha) to prevent stem development and optimize palatability. Such intensive grazing means that the grazing rotation needs to be reduced to 12-14 days during spring. A guide to grazing management is provided in Table 1.

Retaining plant density will depend on grazing and fertility management. Allowing tall fescue plants adequate rest periods, especially in the crucial autumn months when underground rhizomes are developing, is essential if new tillers are to form and the stand to persist. Adequate fertility inputs are also required to promote the healthy growth of tall fescue over other plant species and maintain plant density.



Figure 2. Allowing tall fescue to recover from grazing periods is critical for persistence and to maintain palatability

Seed set and seedling recruitment

Tall fescue does not need to set seed in the first year of establishment. Some Mediterranean cultivars (eg. Flecha) however, have been shown to recruit from seed shed. Generally for most cultivars, allowing tall fescue to grow rank and develop seed-heads will result in reduced tiller number. Tall fescue plants increase through tiller increase and rhizome development.

Fertility management

Low soil fertility and inadequate fertiliser application will result in tall fescue decline within the pasture sward. Low or infrequent fertiliser applications will allow more annual plant species, especially annual grasses, to invade the pasture sward. A legume component consisting of either subterranean, white or other species of clover, within the tall fescue pasture can supply nitrogen and improve the palatability of the pasture sward. Attention to grazing management in the spring when annual legumes are most active is important to maintain an optimum balance between the legume and the tall fescue components. Maintenance phosphorus requirements are 30-50 kg P/ha/year (Milne 2001) but will vary according to soil type, stocking rate and production levels. Nitrogen

requirements will depend on the density of clover in the pasture sward. Tall fescue can respond readily to nitrogen application at any time of the year providing there is adequate soil moisture for growth. Nitrogen can be applied to improve tiller density especially in autumn. This may be a useful strategy to improve winter growth.

Sulphur and potassium are required by the legumes which fix nitrogen for the tall fescue. Assessing the growth and health of legumes will provide an indication of whether these elements are required in the tall fescue pasture.



Figure 3. *Genesis lucerne* in a *Flecha Max P* tall fescue pasture

Weed management

Weed invasion in a tall fescue pasture will depend on the effectiveness of the weed management and the amount of bare ground left after the establishment phase. Significant areas of bare ground provide gaps for weed species to colonize and compete with the existing tall fescue plants. Ensuring appropriate grazing management during autumn to encourage rhizome production and new tillers will decrease the amount of bare ground. Management of winter growing annual grass species (eg. *Vulpia* spp.) through herbicide application may be important in the established pasture to prevent weed invasion.



Figure 4. Bare ground between rows of tall fescue can provide space for weeds to colonize

Drought management

Prolonged dry periods can affect the survival of tall fescue pastures. Continental tall fescue should not be grazed during droughts and stock should be removed once the bulk of the dry material has been grazed. If summer rainfall activates the Continental tall fescue pasture, plants should be allowed to grow to at least 12 cm before a short period of grazing. Grazing before this height is reached

can significantly weaken the plant and may result in plant death. In areas with dry summers, Mediterranean tall fescue cultivars are preferred as they generally don't respond to summer rainfall.

Palatability and silage

Tall fescue cultivars vary significantly in their nutritive value but generally, the soft leaved cultivars are more palatable than other cultivars (see AG 1241 for tall fescue cultivars). Maintaining vegetative growth will optimize palatability for dairy cows.

Tall fescue should not be cut for silage in the establishment period as this will reduce tillers and weaken plants. Mature tall fescue can be cut early in spring for silage when there is a lower risk of high temperatures after the harvesting period. Sufficient soil nitrogen and rainfall is required after harvest to allow the tall fescue to recover.

Further reading

- Anon. Tall fescue on-line monograph. <http://forages.oregonstate.edu/is/tfis/monograph.html>.
- 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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