Sub Clover

Increasing production with subterranean clovers

Seed Force

the facts about

sub clover

While subterranean clover (sub clover, *Trifolium subterraneum*) is the best-adapted clover for dryland pastures in New Zealand, there is a lot of confusion and misinformation surrounding it. In our experience, disappointing results are caused by:

- Planting a variety not suited to NZ conditions
- Planting a cultivar not suited to their farm conditions
- Not sowing enough seed
- Not managing it correctly.

The importance of legumes in New Zealand

Clovers, along with other legumes such as lucerne, are an essential component of New Zealand pasture systems because of their ability to fix N from the air through a symbiotic relationship with bacteria which form nodules on legume root systems.

This fixed N in the soil is available for uptake by non legume pasture plants. The three most common commercially available clovers in New Zealand pastures are the perennials white clover (*Trifolium repens*) and red clover (*T. pratense*) and the annual sub clover (*T. subterraneum*). They fix about 30 kg N per tonne of clover dry matter grown.

Selecting sub clover cultivars

There are very large differences among cultivars and it is vital to sow those that are well adapted to local conditions. The following characteristics are important to consider:

1. Flowering time

> Cultivar flowering time indicates the environment it is best suited to and its management (grazing strategies and reseeding). There are two scenarios to consider:

- Later flowering cultivars have a longer growth cycle and the opportunity to exploit favourable growth conditions in November/December but will be ill adapted if drought starts in early November in most years;
- If the strategy is to maximise early spring biomass production for ewe lactation, then earlier flowering cultivars are desirable in the seed mix.

2. Hardseededness

> A hard seed protects against false strikes. Some of the seed set by sub clover contains hard seeds. Some of these seeds will germinate one or two years later than most. This helps protect the plant from 'false strikes' where early germination in late summer is followed by autumn drought and loss of seedlings.

3. Burr burial

> Burr burial is an important characteristic. Cultivars with low ratings tend to be less persistent on some soil types and may require special management.

4. Other important characteristics for New Zealand dryland conditions

> prostrate growth habit and leaf size

> cold sensitivity and tolerance

> biomass production and disease and pest susceptibility.

getting the

best sub clover results

1. Site preparation

> The methods of site preparation will depend on the topography of the site and previous use (e.g. cropping or pasture).

Weed control

> Sub clover is a poor competitor and sensitive to shading, so effective weed control is essential for successful establishment.

Cultivation

> On flat to rolling terrain, normal fine, firm seed bed recommendations apply.

2. When to sow

> Sub clover should be sown in autumn. Soil moisture is an important environmental factor for germination so seed should be sown between late February and mid-April in response to individual summer rainfall pattern and soil moisture accumulated during any summer fallow. Sub clover should not be sown in spring as it is unlikely to set seed before summer drought.

3. Sowing

> The need to sow sub can be determined by the lack of it. If you can walk across the paddock in September without standing on sub clover at each step you have not got enough. You either have a poorly adapted cultivar and/or what you have has been mismanaged.

Seed sowing methods

> The method of sowing sub clover seed in dryland pastures depends on the topography.

- Direct drilling
  If possible, sub clover seed should be drilled rather than broadcast. This is because the seed is adapted to germinate from seed burrs buried in the top 10 mm of soil.
- Broadcasting
  In steep hill country areas, aircraft are used to spread seed by over-sowing. It is recognised that rates of establishment using over-sowing are usually much lower compared with drilling.

What rate to sow

> Cultivars differ in seed size but in most cases there are only 15 seeds per square metre for each kilogram sown. Therefore 10 kg per hectare will give about 100 established plants per square metre.

Managing your sub clover pasture

Sub clover dry matter production

> Pure swards of sub clover produce 5 to 16 t DM/ha/yr depending on rainfall. This is similar to mixed grass and clover pastures at the same site. However, clover content is often only 10 to 20 per cent of the total production in mixed pastures. Clover herbage has a higher feeding value than grass. Therefore farming for legumes rather than grass is advisable to maximise lamb growth during ewe lactation.

> Sub clover can withstand heavy grazing but careful grazing management, particularly during flowering, is key to sub clover persistence in permanent pastures.

Graze lightly in first season

> Grazing management during the first spring flowering of newly established sub clover should be lax (i.e. over 2000 kg DM/ha). However, towards the end of the growing season, stock should be removed due to selective grazing of the clover. This should be one to two weeks before the typical dry period.

Autumn

> Before sub clover germination in autumn, aim to keep grass in pastures short with a mass of 700-1000 kg of DM/ha (1-2 cm). After a good strike, spell the pasture until sub has at least four trifoliate leaves. Sub thrives when it is given a chance to establish before its first grazing.

Spring

> Reap the rewards. The spelled sub clover-dominant pastures will provide maximum ewe lactation during lambing.

Seed Force sub clover varieties

Our sub clover varieties are the result of the latest breeding from one of the world's best regarded sub clover breeding programmes – a joint venture between Seed Force and the Department of Agriculture and Fisheries Western Australia (DAFWA).

SF Rosabrook - *subterraneum*

> Late flowering

> Hardseededness rating of 5, ideally plant with an earlier flowering cultivar with a lower hardseededness level such as SF Narrikup

> Red Legged Earth Mite (RLEM) tolerance

SF Narrikup - *subterraneum*

> Mid-season maturity, plant with a complimentary cultivar such as the late flowering SF Rosabrook, to help extend production length

> Hardseededness rating of 3, excellent burr burial

> Red Legged Earth Mite (RLEM) tolerance

SF Rouse - *yanninicum*

> White seeded *yanninicum* subspecies suited to waterlogged soils or higher rainfall areas

> Mid-late flowering = ideally suited to New Zealand

> Red Legged Earth Mite (RLEM) tolerance

Seed Force

Seed Force Office
PO Box 16 625
Christchurch 8441
New Zealand

Office: 03 344 1690
Fax: 03 344 1699
Free phone: 0508 7333 36
Email: office@seedforce.co.nz

www.seedforce.co.nz

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For more information:
http://www.lincoln.ac.nz/Lincoln-Home/Research/Current-Research/Dryland-Pastures-Research/