

# DAIRY PASTURE SOWING GUIDE

**SPRING** 2010



# Foreword from Sue Macky



## Introduction

- by Sue Macky, BVSc DPSL, Dairy Production Systems Ltd.

Not many of us like change, especially as so many changes in our lives are not under our control. One of the things that we can change is the quality and quantity of pasture we feed our cows, yet surprisingly little pasture renewal actually occurs. Of the highly-productive, high-performing farms that I work with, attention to detail is a defining characteristic, one that extends to include extensive, planned pasture-renewal programmes (10% – 30% per year). Quite simply they get more milk solids per hectare with easier management from the new pasture species and well managed cows.

Reasons to renew pasture centre around the ability to grow more pasture, which is more easily consumed, digested and converted to milk per cow and per hectare. A combination of past management, changing climate and soil conditions, and greater incursion of weeds, changes the make-up of our pastures. The toughest survive, the weaker get replaced by less productive plants, usually weeds

or “summer” grasses. Tough grasses may be high drymatter producers, but they tend to be plants that rapidly develop thicker cell walls and have a lot of aftermath heading. This depresses bite rate and size, meaning less total drymatter is eaten per day by the cow, regardless of how much is offered. These changes still occur even with the best pasture management. More significantly, the milk-producing nutrient content of each kilogram of drymatter eaten is also depressed – thicker cell walls leave less space in the cell for protein and sugar etc that the cow needs for production - a double loss of potential performance. In mid-summer in the Waikato, it is not uncommon to be in paddocks where less than half the plants present per square metre are desirable “milk producing” species.

By eliminating the older species and their accompanying problems of weeds and pests, preferably via a planned approach (properly performed, including crops) we can significantly increase the production potential per hectare, and make management easier.

All the best for the season ahead.



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Priority Partnership® points are attributed to the following Agricom products:

**Commando AR37, ONE<sup>50</sup> AR1, ONE<sup>50</sup> LE, and Warrior.**



For complete independent National Forage Variety Trial (NFVT®) results printed in this book, go to [www.nzpbra.org](http://www.nzpbra.org)



### ONE<sup>50</sup> Standing out above the rest

Third generation Outram dairy farmer, Brian Michelle does have one regret when it comes to the Agricom late-heading ryegrass **ONE<sup>50</sup>** he planted on their farm last year.

“We regretted not putting more of it in!” Brian says.

“It was suggested to us we give **ONE<sup>50</sup>** a try. We had 2 hectares that was ready to be sown so we thought we’d give it a go. It’s now outgrowing everything else on the farm.”

Using a plate meter to measure the growth, Brian says it clearly shows **ONE<sup>50</sup>** is well ahead in producing more kg DM/ha/day.

“All of the other paddocks are 3 hectare paddocks, but the **ONE<sup>50</sup>** is only in the 2 hectare paddock. The **ONE<sup>50</sup>** is producing the same amount as the 3 hectare paddock in the same time and the plate meter reading reflects that.”

“We have taken everything else into account, like fertiliser application, and the only thing that is different is the type of grass.”

With about 9 hectares of chow ready to be re-grassed, Brian says there is no doubt that he will be using **ONE<sup>50</sup>**. “Our normal re-grassing programme is probably going to be in the order of 20-30 hectares and I would imagine 50 percent of that will be **ONE<sup>50</sup>** as well.”

# An Unbeaten Late-Heading Ryegrass

“Outstanding production and quality”

- Available with **AR1** novel endophyte and LE
- Outstanding summer, autumn and winter production
- Very high total production
- Late-heading, good spring quality and summer leafiness
- A New Zealand-bred and adapted late-heading perennial ryegrass

### Bred for late-heading and production

**ONE<sup>50</sup>** is a cross of elite genetics of New Zealand and north-west Spanish origin. It was bred using individual plants that were screened in the pest and rust-prone north of New Zealand. **ONE<sup>50</sup>** is a late-heading, diploid perennial ryegrass of medium leaf and tiller size.

### Performance

**ONE<sup>50</sup>** has exceptional leaf production through summer (Figure 2) and high drymatter production through autumn and winter. **ONE<sup>50</sup>** is unbeaten for performance (Figure 1), especially when compared with other late-heading cultivars, and has very good persistence.

Suggested Dairy Pasture Mix	
Cultivar	kg/ha
<b>ONE<sup>50</sup></b> perennial ryegrass	20
<b>Tribute</b> white clover (bare seed)	3
<b>Emerald</b> white clover (bare seed)	2
<b>TOTAL</b>	25

NB: **Choice** chicory, **Tonic** plantain, **Sensation** or **Colenso** red clover can be added as desired.

Figure 1 . NFVT<sup>®</sup> Perennial Ryegrass Canterbury Summary, 1991-2009, Total Yield

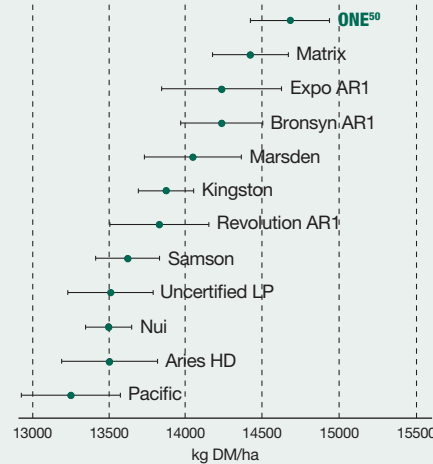
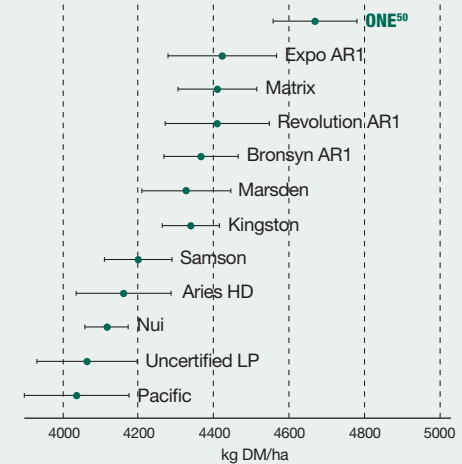


Figure 2. NFVT<sup>®</sup> Perennial Ryegrass Canterbury Summary, 1991-2009, Summer Yield



National Forage Variety Trials \*(Independent seed testing conducted by NZ Plant Breeding Research Assoc.)



# High Performance Perennial Pasture

“Optimum quality all-year-round”

- Available with **AR37** endophyte for persistence and pasture production advantages
- Very late-heading date and tetraploid for optimum feed quality
- Perennial
- Strong year-round growth

**AR37 FOR PERSISTENCE**

## Bred to provide high quality forage all-year-round

**Halo** was bred by combining the best tetraploid perennial genetics, with the majority originating from north-west Spain, a region favoured by ryegrass breeders. This provides **Halo** with very strong winter growth, heat tolerance, summer production and persistence.

**Halo** is the first tetraploid perennial ryegrass available with **AR37** (see page 9). This allows farmers to choose a ryegrass which not only maximises animal performance, but will also have resistance to more insects and therefore improves persistence in many environments.

## Performance

**Halo** should be used where farmers require maximum performance from a perennial tetraploid pasture. It can be used in all regions, but longevity and production will be optimised on soils with good fertility and drainage, and that don't suffer from severe droughts.

**Halo AR37** will survive and produce better than many cultivars where there is insect pressure, especially black beetle and root aphid.

As with any tetraploid ryegrass, persistence may be compromised through repeated close grazing in droughts, or pugging damage.



**Halo AR37** (right) versus another commercially available tetraploid perennial ryegrass.

Suggested Dairy Pasture Mix	
Cultivar	kg/ha
<b>Halo AR37</b> perennial ryegrass	25
<b>Emerald</b> white clover (bare seed)	3
<b>Tribute</b> white clover (bare seed)	2
<b>TOTAL</b>	30

# Persistent Perennial Pasture

“Persistence and excellent early-spring growth”

- Available with **AR37** and **AR1** novel endophytes and LE
- Bred specifically for high production dairy farms
- Explosive early-spring growth
- Bred from persistent plant types
- Good rust tolerance

**AR37 FOR PERSISTENCE**

## Bred for performance under pressure

**Commando** was bred by AgResearch Grasslands specifically for dairy pastures and other intensive pasture systems. While **Commando** has very good production, its key strength is persistence. Compared with other dairy-type ryegrasses, **Commando** has a dense ground cover, leading to good tolerance to pugging and over-grazing.



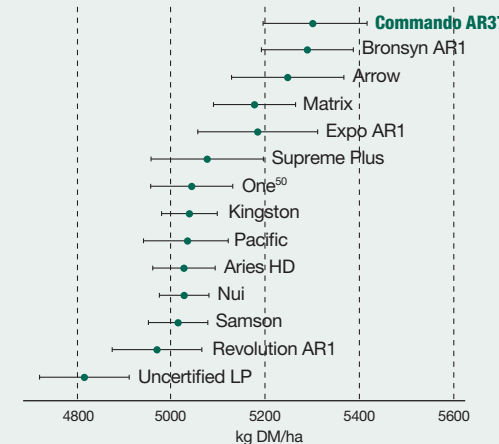
Table 1. Death of Porina after 4 weeks, AgResearch Ruakara

	% of Porina Dead
No endophyte (LE)	5
Standard endophyte (HE)	50
AR37 endophyte	95

## Performance

**Commando** is a reliable high-yielding ryegrass that has performed well from Northland to Southland. **Commando** has rapid regrowth in early-spring (Figure 3), which helps to meet the crucial animal demand on most dairy farms at this time. This early growth combined with good rust tolerance and summer growth, is ideally suited to the seasonal demands on dairy farms.

Figure 3. NFVT® Perennial Ryegrass All New Zealand Trials, 1991-2009, Spring Yield



## Suggested Dairy Pasture Mix

Cultivar	kg/ha
<b>Commando</b> perennial ryegrass	20
<b>Tribute</b> white clover (bare seed)	3
<b>Emerald</b> white clover (bare seed)	2
<b>TOTAL</b>	25

NB: **Choice** chicory, **Tonic** plantain, **Sensation** or **Colenso** red clover can be added as desired.



### Ohau's Early Spring Growth Suits Farming System

A grass with growth characteristics that suit his farming system is how western Southland farmer Owen Copinga describes Agricom's **Ohau** tetraploid long-rotation ryegrass.

Farming at Otautau, Owen and his wife Cathy milk 750 cows on 280 hectares effective.

"We have cool winters and mild moist summers," Owen says. "**Ohau** is a grass that starts growing early in the spring which is when we need it most for our farming system."

Having sown around 15 percent of the farm in **Ohau**, along with clover, Owen says the grass is coming into its third season.

"It doesn't matter what time of the year it is, there is always high quality feed in those paddocks."

"Effectively, it has very good core season growth but it persists really well when the feed demand is highest."

**Ohau** is also a highly palatable grass he says. "The cows really like it and do well on it."

# High Performance Long-Rotation Pasture



"Feed your cows, not the bugs"

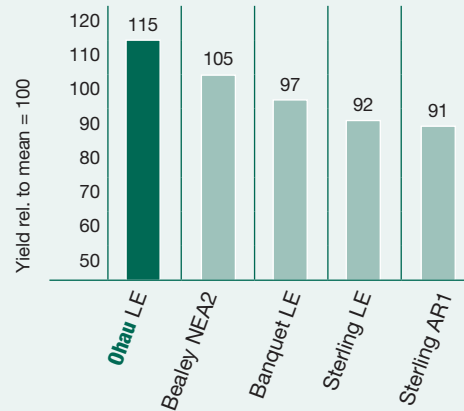
- Available with **AR37** novel endophyte for persistence, **AR1** and LE
- High-yielding ryegrass
- Very strong cool-season production
- Unique heading date (+8) and seasonal growth
- Rapid establishment and explosive winter growth



### Bred for seasonal production and high yields

**Ohau** is the latest generation of tetraploid long-rotation ryegrass. **Ohau** has a late-heading date and was bred for high production and quality. **Ohau** has strong winter and early-spring activity. This allows **Ohau** to contribute valuable growth in the critical early calving-period.

Figure 4. Gore Tetraploid Ryegrass Trial 2004 Winter Yields



### Performance

**Ohau** is an extremely palatable grass, with a high feed value. **Ohau's** palatability results in pastures with a high green leaf content over summer. Persistence is similar to most long-rotation and perennial tetraploid ryegrasses.

**Ohau** is the ideal option for high quality, medium to long-term pastures, in conditions suited to tetraploid ryegrass.

Suggested Dairy Pasture Mix	
Cultivar	kg/ha
<b>Ohau</b> tetraploid long-rotation ryegrass	26
<b>Tribute</b> white clover (bare seed)	3
<b>Emerald</b> white clover (bare seed)	2
<b>TOTAL</b>	31

NB: **Choice** chicory, **Tonic** plantain, **Sensation** or **Colenso** red clover can be added as desired.



**Perenniality**

Perennial

**Stolon Density**

High

**Leaf Size**

Medium-Large

**1000 Seed Weight (grams)**

0.71

**Suggested Sowing Rate (kg/ha)**

3-5

# New Zealand's Largest Selling **White Clover**

“Ideal combination of production and persistence”

- Medium to large-leaved white clover
- High stolon density/leaf size ratio
- Improved out-of-season production
- Shown to be tolerant to clover root weevil

## Breeding

**Tribute** is a medium to large-leaved white clover, with a superior stolon density to leaf size ratio. **Tribute** has been shown to be tolerant to clover root weevil attack. **Tribute** was bred by AgResearch Grasslands from elite germplasm from both New Zealand and Europe.

## Performance

In recent years, **Tribute** has become the largest selling white clover in New Zealand. **Tribute** is an unusual white clover, with high production potential, often the same as the best large-leaved varieties under dairy grazing. However, it also has excellent persistence and production under hard grazing, superior to that of older small to medium-leaved varieties (see Table 1). This unusual combination of production and persistence makes **Tribute** a first choice in dairy pasture mixes. It can be blended with **Emerald** white clover in high performance dairy pastures.

Table 1. Relative Performance and Growth Characteristics of Tribute Compared with Seven White Clover Cultivars in Three North Island Trials (Huia=100) (Woodfield, 2003)

Cultivar	Stolons (no./m <sup>2</sup> )	Rel. Yield	Spring	Summer	Autumn	Winter
<b>Tribute</b>	<b>1853</b>	<b>127</b>	<b>130</b>	<b>120</b>	<b>118</b>	<b>145</b>
Demand	2130	116	120	111	116	117
Sustain	1722	105	111	97	98	113
Challenge	1534	97	106	82	97	114
Prestige	2242	111	119	107	106	110
Tahora	2045	112	123	100	110	119
Prop	1812	93	103	94	82	91
Huia	1810	100	100	100	100	100

Grasslands  
**Emerald**  
White Clover

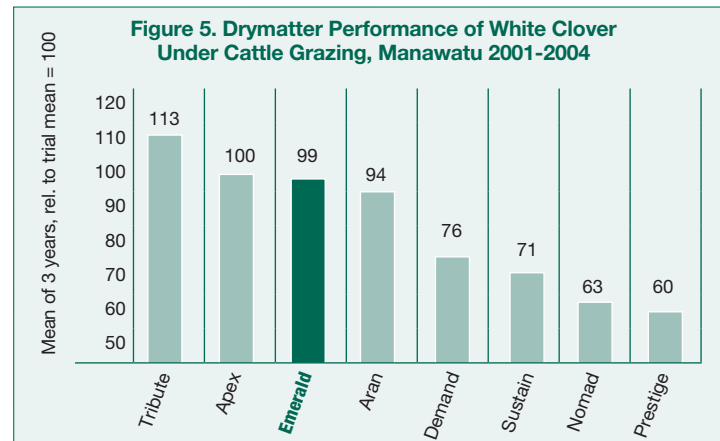
Perenniality	Perennial
Stolon Density	High
Leaf Size	Large
1000 Seed Weight (grams)	0.71
Suggested Sowing Rate (kg/ha)	3-5

## An Ideal White Clover For Dairy Cows

“Large-leaved, high production”

- Large leaf size
- High production
- Tolerance to clover root weevil
- Improved establishment vigour

**Emerald** is the latest large-leaved cultivar bred by AgResearch Grasslands. It has very high production as well as a high stolon density, making it ideal for dairy and other high performance pastures. The vigorous establishment of **Emerald** makes it a preferred clover when sowing with high producing, shorter-term dairy pastures (e.g. Italian ryegrass). **Emerald** is the ideal sowing companion for **Tribute** white clover.



Grasslands  
**Warrior**  
Italian Ryegrass

Ploidy	Diploid
Suggested Sowing Rate (kg/ha)	18-25
Heading Date	Late (+12)
Rust Tolerance	High

## High Performance Short-Rotation Pasture

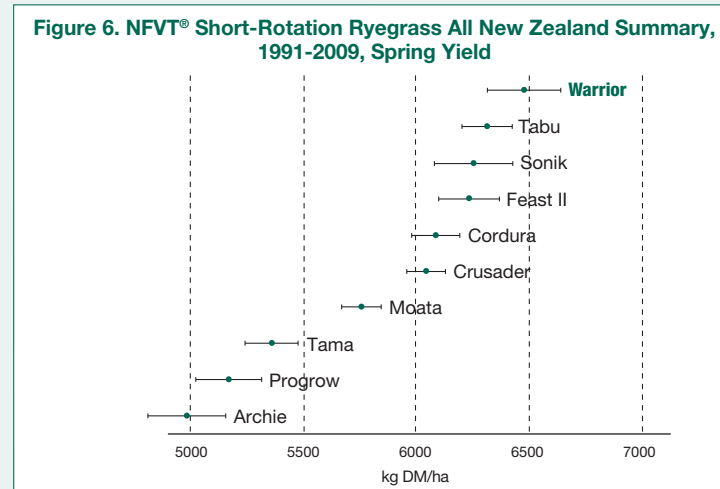
“Unbeaten for spring production”

- Exceptional production
- A leading variety for winter, spring and summer production
- High winter/spring growth
- Excellent disease tolerance

### Performance

**Warrior** has performed exceptionally well in independent trials for pasture production, and rust tolerance. **Warrior** has strong production over the spring (Figure 6) and summer periods, combined with high winter growth rates.

**Warrior** is a fast-establishing Italian ryegrass and also a persistent type, showing good plant survival. **Warrior** is particularly well suited to dairy farmers targeting maximum animal production over a 1-2 year period.



# The AR37 Advantage

**AR37** is the latest novel endophyte developed by AgResearch Grasslands. It is a major breakthrough because perennial ryegrasses inoculated with **AR37** are the first to have resistance to porina\* and root aphid. **AR37** also provides resistance to black beetle, pasture mealy bug and Argentine stem weevil. Ryegrass persistence is improved as a result of greater insect protection, and increased root mass and root depth.

Although **AR37** does not produce lolitrem B it can cause ryegrass staggers. Trials have shown that on average the frequency, duration and severity of ryegrass staggers is less in sheep than for standard endophyte. However on occasions, sheep (and potentially other animals) grazing **AR37** ryegrass may be severely affected for short periods. To date no ryegrass staggers have been reported on dairy cows grazing **AR37** ryegrass.



Ohaupo trial site four years after sowing: **Commando AR1** (left) and **Commando AR37** (right).

In an extensive national trial series, ryegrass with **AR37** has been shown to produce an average of 12% more feed than the same variety with standard endophyte.

Farmers using **AR37** can expect more feed to be grown (+15% to 21% in Waikato/Bay of Plenty, Northland) with the greatest advantages in pasture growth occurring over summer and autumn (+15% and 21% respectively). **AR37** is available in **Commando** (page 5), **Halo** (page 4), **Oha** (page 6) and **Samson** ryegrasses.



**Black Beetle**  
Northland, Waikato, Bay of Plenty, East Coast, Hawkes Bay and Coastal Taranaki



**Argentine Stem Weevil**  
New Zealand wide



**Root Aphid**  
New Zealand wide



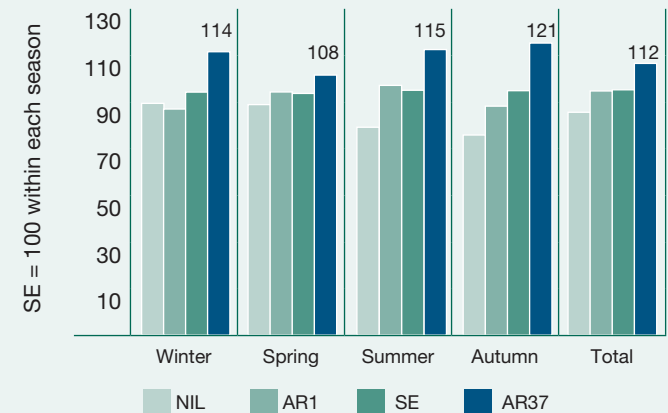
**Pasture Mealy Bug**  
New Zealand wide



**Porina\***  
New Zealand wide, especially areas with moist and cloudy summers

\* Early field trial results have confirmed laboratory evidence of excellent resistance of diploid perennial ryegrass with **AR37** to porina. In pastures with **AR37** ryegrass, porina can be present and feed on other pasture mix components.

**Figure 7. Pasture growth of four endophyte types in one ryegrass cultivar – mean of 11 trials over three years, Kerikeri to Lincoln, relative to standard endophyte = 100.**



# AR37 – DairyNZ Endophyte research



Agricom's Ohaupo trial site, four years after sowing. Same variety with two endophyte options.

The DairyNZ trial on Scott Farm (Waikato) compared **Commando** perennial ryegrass-based pastures infected with **AR37**, **AR1**, Standard (HE) or without endophyte (Nil).

The project aimed to measure ryegrass persistence and pasture yields and to assess any effects of the **AR37** endophyte on cow health and milk production.

In the fourth and final milking season white clover was removed to test the effect of endophyte/ryegrass association in isolation from any effect on clover content of pastures. The following bullet points present a summary of results from the four seasons.

## Overall conclusions:

1. **AR37** ryegrass was clearly more persistent than either **AR1** or Standard (HE) ryegrass. This supports findings from previous work.



2. The greater persistency translated into a reduced need for renovation of **AR37** pastures after the 2008 drought, but in the three years before that time there was no difference in total pasture yield.
3. There was no sign of ryegrass staggers or any other animal health issues in cows grazing **AR1** or **AR37** pastures – even at times when cows grazing HE were affected by ryegrass staggers.
4. With ryegrass/white clover pastures, there was a trend for slightly lower milksolids (MS) production over summer from cows grazing **AR37** or HE compared with **AR1**.

With pure ryegrass pastures there were no significant differences in MS production. These results suggest that the higher clover content of the **AR1** mixed pasture was a contributing factor to the observed MS production differences.

5. Where pasture persistence is the top priority then **AR37** will clearly deliver benefits. Where persistence of **AR1** ryegrass is not a problem, continuing to sow **AR1** is advised. DairyNZ cannot envisage any situation in which farmers should sow HE ryegrass.

**AR37** pasture showing persistence over the same cultivar with Nil endophyte at the DairyNZ trial in the Waikato during the drought early in 2008.

# Best-Practice Pasture Establishment

Successful pasture establishment starts with planning. A rushed decision can result in late-planting, weed invasion, low feed production in the first winter and spring, and poor persistence. Use the following simple checklist to help ensure that your pasture renewal programme is successful.

## 1. Paddock Selection

- Begin with the paddock with the greatest difference between current and potential performance, as the return on investment will be higher.
- Select paddocks early, six months is required to properly prepare for new pastures.

## 2. Paddock Preparation

- Control weeds and weed-seed production in the spring and summer prior to sowing a new pasture. Techniques available include mowing, silage, and fodder crops.

## 3. Sowing

- Assess what insects are present, or likely to be, and decide on the best seed treatment or spraying options. Common problem insects are Argentine stem weevil, grass grub, porina, and slugs (direct-drilling).
- Order seed several weeks before planting, with instructions on seed treatment you require (Table 2).
- Wait until pastures are actively growing in mid-spring and then use a knockdown spray in order to control germinating weeds. Sowing can commence 3-5 days later.
- Ensure that cultivated paddocks are even, and have a fine and firm seed bed.
- Sow seed at 10 mm depth. Deep sowing is the most common cause of poor clover establishment.

Table 2. Seed Treatment Summary

Insect	Seed Treatment
Argentine stem weevil (ASW)	Superstrike or Ultrastrike
Black beetle	Superstrike or Ultrastrike
Grass grub	Ultrastrike or Gaucho

- Press-wheels or a roller are often needed for seed-soil contact and to get the pasture up quickly and evenly.
- Paddocks that are being direct-drilled should also be level and clear of excessive trash.
- Use fertiliser at sowing. Ready access to nitrogen (N) and phosphorous (P) will ensure rapid and vigorous early growth.

## 4. Monitoring the Paddock After Sowing

- Frequently monitor newly sown pastures for weed and insect pests. Controlling weeds early requires less chemical, is more effective and often has less impact on the sown pasture. Insect pests can decimate an emerging pasture; prompt action prevents significant plant losses and loss of production.

## 5. First Grazing

- First grazing should only occur once the plant has begun to tiller out and is at least 10 cm high. Ensure plants are firmly anchored in the ground before grazing and avoid over-grazing or pugging damage.
- Calves or heifers are best, and avoid grazing when the soil is wet.
- Consider an application of N-based fertiliser after the first grazing to promote quick recovery and to encourage further tillering of the plants.



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