

DAIRY PASTURE SOWING GUIDE

AUTUMN 2011



Foreword from Alison Popay



Pest-proofing your new pastures for better persistence

by Dr Alison Popay, Entomologist, AgResearch.

Selecting the right ryegrass cultivars for performance on your farm is important, but even more important is selecting the right endophyte for your ryegrass. The advantage of having endophytes is to provide resistance to pests, and this can have a dramatic effect on pasture persistence and growth.

If you are satisfied with the performance and persistence of **AR1** ryegrass on your farm, it is worth continuing with **AR1**. If however, you are not getting the pasture performance you would like and think pasture pests may be the cause, then **AR37** endophyte will provide you with better insect protection and is the right endophyte for you.

AR37 protects your ryegrass from Argentine stem weevil, black beetle, porina, pasture mealy bug and root aphid. **AR37** may cause ryegrass staggers, although episodes are generally less frequent and less severe than those caused by the toxic standard endophyte. To date it has not been observed in dairy cows, despite testing and widespread use over several years.

In pest-prone areas, like the Waikato **AR37** has set a new benchmark in ryegrass productivity and persistence with better performance from a cultivar with **AR37** than both **AR1** and the standard toxic endophyte when compared to the same cultivar.

Some other thoughts –

Seed treatment is still recommended for ryegrasses with novel endophyte, because insects cause damage before the endophyte in plants can produce enough chemicals. Secondly, where pest numbers are high, reduce them with a cropping phase before planting perennial pasture, and finally, animals often graze ryegrass with **AR1** or **AR37** closer to the ground than standard endophyte, so remove animals before they overgraze them.

All the best for a successful pasture renewal season.



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The AR37 Advantages - Persistence and Production

AR37 is a major breakthrough for ryegrass pastures because it is the only novel endophyte proven to improve the production and persistence of ryegrass plants, when compared with standard endophyte (SE).

AR37 provides the widest range of insect protection of any endophyte commercially available, including; black beetle, root aphid and Argentine stem weevil. **AR37** improves the persistence of ryegrass plants through this greater insect protection, and increased root mass and depth.

AR37 provides as much, or more, persistence benefits to ryegrass plants as the SE found in old cultivars.

AR37 can cause ryegrass staggers, but this has not been observed in dairy cows to date, despite testing and extensive use on farms for several years. Extensive research by DairyNZ comparing milk production from pure ryegrass pastures found there were no differences between **AR1** and **AR37**. The **AR37** pastures however showed greater persistence than **AR1** and SE in the same cultivar.

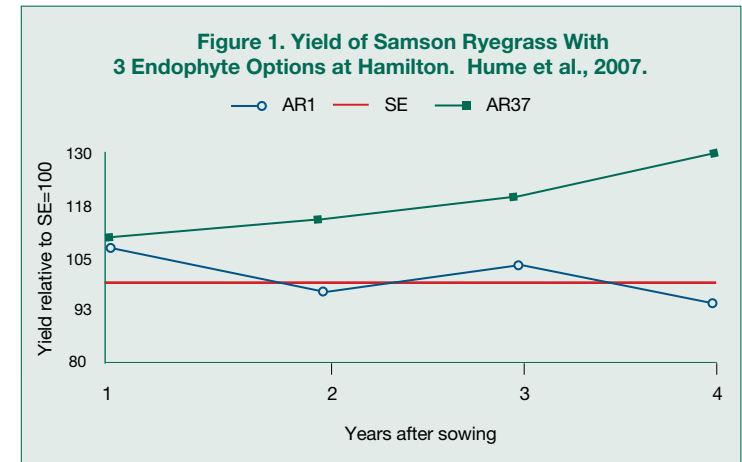


Ryegrass with **AR37** endophyte (right) demonstrates persistency advantages over **AR1** endophyte (left) in the same cultivar, Waikato 2009.

Dairy farmers can use **AR37** novel endophyte, and potentially profit from the pasture persistence and production advantages it provides. **AR37** is available in a range of Agricom cultivars (Table 1).

Table 1. Agricom Ryegrasses with AR37			
Cultivar	Ploidy*	Persistence	Heading Date
Commando	D	Excellent	+1
Samson	D	Excellent	+3
ONE⁵⁰	D	Excellent	+20
Halo	T	Good	+25
Ohau	T	3-5 yrs	+8

*D= Diploid, T= Tetraploid



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 ryegrass with **AR37** to porina. In pastures with **AR37** ryegrass, porina can be present and feed on other pasture mix components.



COMMANDO - Meeting the challenges of climate and pests

For Chris Stacey using **Commando** with **AR37** has been the key to reducing black beetle damage on the Korakonui property he and father Richard farm south east of Te Awamutu.

On rolling to steep land converted to dairying with a 155 ha milking platform, Chris and his father have been milking 440 cows for the past five years.

“Our main challenges here are the climate and pests,” Chris says.

“We’ve had droughts the last two or three seasons and black beetle are a problem.”

Over three years Chris says they have sown around 40 ha in both **Commando** and **Halo** with **AR37**.”

“I have used **ONE**⁵⁰ with the **AR1** which I do like, but the **AR37** has certainly made a difference.”

The **AR37** endophyte has shown better persistence and the black beetle damage has been a lot less.”

Persistent Perennial Pasture

“Persistence with excellent early-spring growth”

- Available with **AR37** and **AR1** novel endophyte and LE
- Proven to have good persistence
- Bred specifically for high production dairy farms
- Explosive early-spring growth
- Good rust tolerance

Bred for performance under pressure

Commando was bred by AgResearch Grasslands specifically for dairy pastures and other intensive pasture systems. **Commando** was developed from persistent plants collected in Northland, a tough environment for perennial ryegrass, which enabled intensive selection for rust tolerance and persistence, under hot and humid conditions. Insect protection from the **AR37** endophyte enhances the very good persistence of **Commando**.

Suggested Dairy Pasture Mix	
Cultivar	kg/ha
Commando AR37 perennial ryegrass	20
Tribute white clover	3
Emerald white clover	2
TOTAL	25

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



Performance

Commando is a reliable high-yielding ryegrass that has performed well from Northland to Southland. **Commando** has rapid regrowth in early spring, 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.

The key advantage in choosing **Commando** is its reliability and proven persistence. On many farms and trials, it has stood the test of repeated droughts, insects and harsh grazing, and gained a strong reputation amongst farmers as a persistent and productive grass.





ONE⁵⁰ - Doing great but about to get even better

Dean Boros says he can't wait to sow ONE⁵⁰ AR37 on his better land of the 3390 ha farm he manages in the Waipa Valley in Te Kuiti.

Sowing around 45 ha of ONE⁵⁰ AR1 in 2007 on the hill country of the dairy grazing and sheep block, Dean is impressed with how well it has done. "We've used different varieties of grasses over the last three years, but I believe the ONE⁵⁰ AR1 we've been using is the best. Three years later it's still going strong."

Dean says one advantage is he can graze the ONE⁵⁰ AR1 paddocks more often than others sown in different varieties. "It's really noticeable because it grows well through winter. I've shown the pasture to people in winter and they can't believe how good it is," he says. "We plate meter quite a bit and that paddock is in the top lot of existing pastures."

"The ONE⁵⁰ has done so well here, I'll definitely be putting it in again, but will take advantage of the AR37 which is available now. We haven't had a major problem with pests but AR37 will just safeguard us."

An Unbeaten Late-Heading Ryegrass

"Outstanding production and quality"

- Available with AR37 and AR1 novel endophyte plus LE
- Outstanding summer, autumn and winter production
- Very high total production
- Good spring quality and summer leafiness
- A New Zealand bred and adapted late-heading perennial ryegrass

Bred for late-heading and production

ONE⁵⁰ 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. ONE⁵⁰ is a late-heading, diploid perennial ryegrass of medium leaf and tiller size.

Performance

ONE⁵⁰ has exceptional leaf production through summer and high drymatter production through autumn and winter. ONE⁵⁰ is unbeaten for performance (Figure 2), especially when compared with other late-heading cultivars, and has very good persistence. ONE⁵⁰ AR1 is not recommended in regions prone to black beetle.

Suggested Dairy Pasture Mix	
Cultivar	kg/ha
ONE ⁵⁰ perennial ryegrass	20
Tribute white clover	3
Emerald white clover	2
TOTAL	25

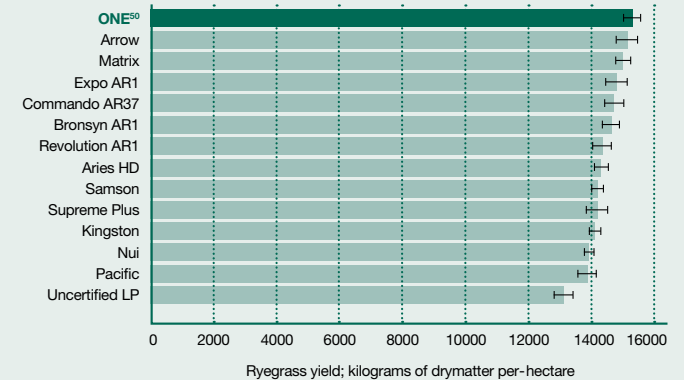
NB: **Choice** chicory, **Tonic** plantain, **Sensation** or **Colenso** red clover can be added as desired.



Now available with AR37*

ONE⁵⁰ is available from March 2011 with the novel endophyte AR37, which is ideal for the upper North Island due to AR37's superior insect tolerance. It is recommended that ONE⁵⁰ AR37 be sown in dairy situations and ONE⁵⁰ AR1 is recommended for sheep pastures.

Figure 2. NFVT[®] Perennial Ryegrass All New Zealand Summary, 1991-2009, Total Yield.



*ONE⁵⁰ with AR37 may have higher instances of ryegrass staggers than other cultivars with AR37 in some situations.



High Performance Perennial Pasture

AR37 FOR PERSISTENCE



“Optimum quality all-year-round”

- Available with **AR37** endophyte for persistence and pasture production advantages
- Very late-heading date for optimum feed quality
- Tetraploid perennial with good tiller density
- Strong year-round growth

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**. 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.

Suggested Dairy Pasture Mix	
Cultivar	kg/ha
Halo AR37 tetraploid perennial ryegrass	25
Emerald white clover	3
Tribute white clover	2
TOTAL	30

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

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 tetraploid 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.



OHAU AR37 – Outgrowing other grasses

It is early days but Waikato dairy farmer Doug Duncums says the **Ohau AR37** tetraploid long-rotation ryegrass he planted in April this year is “still growing vigorously.”

Planting 35 ha on the 240 ha Whitehall property, south of Cambridge, Doug says he was looking for a grass that would persist through winter and spring time. So he direct-drilled **Ohau AR37** into existing pasture.

“In the past we’ve planted Italian ryegrass which only lasts one to one and a half seasons, so we wanted something that would last a bit longer.”

“The **Ohau AR37** is certainly outgrowing the more permanent pastures we have on the farm and this year hasn’t been a great spring. Considering what the **Ohau AR37** pasture has been through it has done really well.”

While black beetle is prevalent in the area Doug says it has not been a major problem on the farm yet. “Having the **AR37** was definitely a plus though. The black beetle is not chronic but we are aware of it and getting on top of it before it becomes a problem is a bonus.”

The Undersowing Option

“Feed your cows, not the bugs”

- Available with **AR37** novel endophyte for persistence
- Rapid establishment and explosive winter growth - ideal for undersowing
- High yields
- Very strong cool-season growth
- Unique heading date (+8) and seasonal growth
- Very high feed value

Get more from your undersowing

Ohau AR37 is the new tool when undersowing ryegrass this autumn. Italian and short-rotation ryegrasses have been the most common types used for undersowing into existing pasture to provide an improved bulk of winter and spring feed. However, they do not provide any protection against Argentine stem weevil, black beetle, pasture mealy bug, or root aphid which means their regular use provides the perfect pastures for maintaining high populations of any of these insect pests. As a result, the new grasses are frustratingly short-lived.

Suggested Undersowing Mix	
Cultivar	kg/ha
Ohau AR37 Superstrike* ryegrass	16-25
Emerald white clover (optional)	4
TOTAL	20-29

* Ultrastrike should be used if grass grub is present.
NB: **Choice** chicory, **Tonic** plantain, **Sensation** or **Colenso** red clover can be added as desired.

IDEAL FOR UNDERSOWING



Ohau AR37 provides a great balance between invigorating your pasture by undersowing, but also providing superior insect protection and persistence. The **AR37** endophyte acts like a natural insecticide that removes the stresses of insect feeding, and allows the full genetic potential of the ryegrass for both production and persistence to be expressed (see photo, below).

Performance

Ohau AR37 is a tetraploid long-rotation ryegrass with outstanding growth in winter and early spring and excellent feed quality throughout the year. Trials have confirmed it to be a leading variety for total and seasonal production, and persistence.



10-month-old trial plots at Morrinsville, Waikato **Ohau AR1** (left) and **Ohau AR37** (right).



Tall Fescue for Milk and Persistence

**GRASS GRUB
TOLERANT**

MaxP

Advance tall fescue with **MaxP**® is used on dairy farms to overcome the limitations of perennial ryegrass. Especially in the upper North Island, perennial ryegrass is not ideally suited to many environments and often suffers from insect pest pressure, drought and heat stress, resulting in disappointing persistence and poor summer and autumn growth.

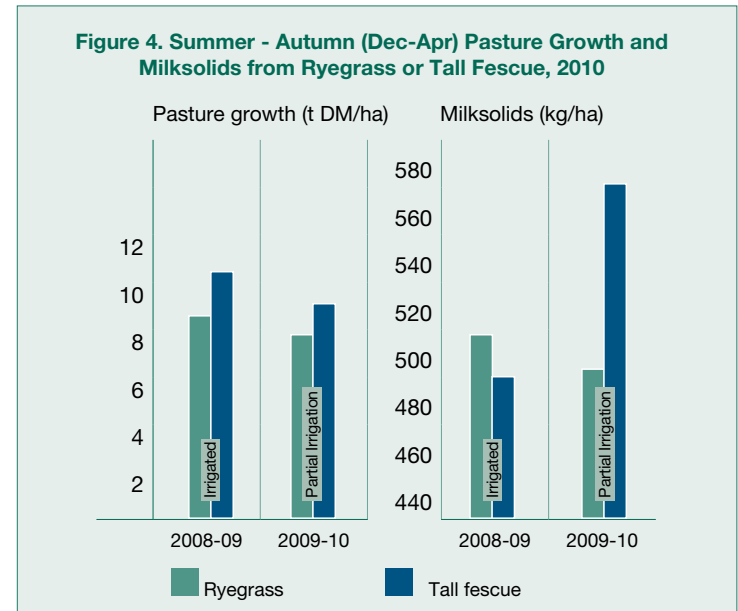
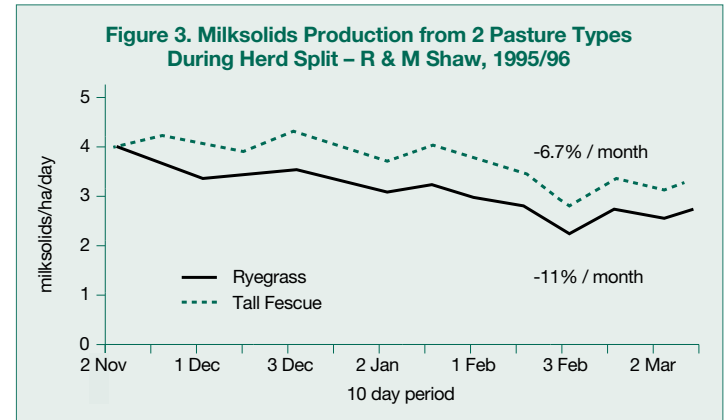
Advance tall fescue with **MaxP**® is a deep-rooted grass with better drought tolerance, summer and autumn growth (up to 77% more February – March), persistence and tolerance to insects. Unlike ryegrass, **Advance** tall fescue with **MaxP**® deters most adult insects from feeding once established, and also has tolerance to root feeding insects (e.g. grass grub and black beetle larvae).

Tall fescue is suited to a wider range of soil types, including peat soils and those prone to water logging.

While the tall fescue species has naturally less palatability than ryegrass, **Advance** with **MaxP**® was bred for a soft and palatable leaf. **Advance** with **MaxP**® is the only tall fescue that has been tested for milk production, and several trials and many years of on-farm experience have found it to be palatable, easy to manage and produces large quantities of milk.

Grazing management of tall fescue is not difficult, simply graze paddocks when they reach a cover of 2700-3000 kg DM/ha, and be aware that spells between grazing may be shorter than for ryegrass due to different pasture growth rates.

Tall fescue is slower to establish, so weed competition needs to be minimised through good cropping and spraying programmes prior to planting. A suggested sowing mix is: **Advance MaxP**® (25 kg/ha), with **Emerald** and **Tribute** white clover (2 and 2). Optional additions are **Sensation** red clover (5), **Choice** chicory (1.5), **Tonic** plantain (1), or **Maru** phalaris (3).



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 2). 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 2. Relative Performance and Growth Characteristics of Tribute Compared with Seven White Clover Cultivars in 3 North Island Trials (Huia=100) (Woodfield, 2003)

Cultivar	Stolons (no./m ²)	Rel. Yield	Spring	Summer	Autumn	Winter
Tribute	1853	127	130	120	118	145
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

Perenniality

Perennial

Stolon Density

High

Leaf Size

Large

1000 Seed Weight (grams)

0.71

Suggested Sowing Rate (kg/ha)

3-5

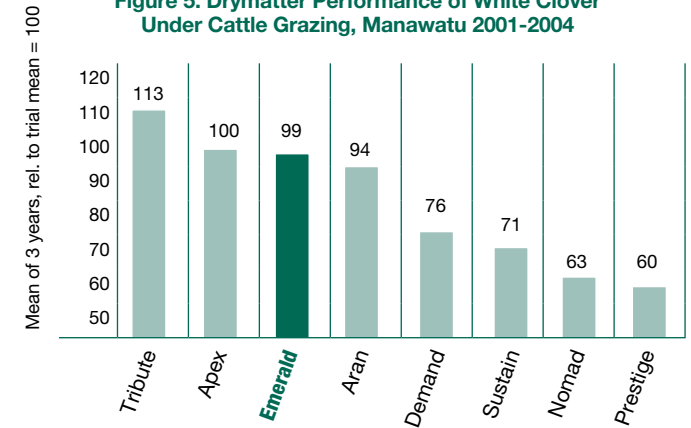
An Ideal White Clover For Dairy Cows

“Large-leaved, high production”

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

Emerald a 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.

Figure 5. Drymatter Performance of White Clover Under Cattle Grazing, Manawatu 2001-2004



High Performance Short-Rotation Pasture

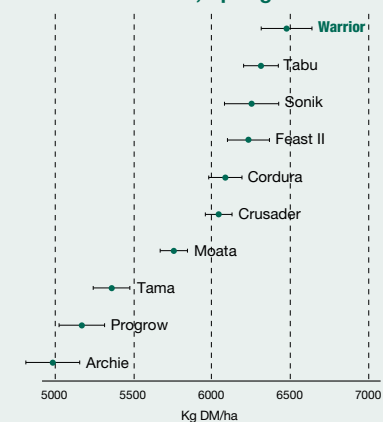
“Unbeaten for spring production”

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

Bred for production

A novel approach was taken when breeding **Warrior**. A large number of plants were screened in southern Queensland, a tough environment for Italian ryegrass due to heat and rust pressure. Plants were selected for drymatter production, seedling vigour and rust tolerance.

Figure 6. NFVT® Short-Rotation Ryegrass All New Zealand Summary, 1991-2008, Spring Yield



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, black beetle, grass grub, porina, and slugs (direct-drilling).
- Order seed several weeks before planting from your retailer, with instructions on seed treatment you require (Table 3) so it will be available when you are ready to sow.
- Wait until pastures are actively growing in early-autumn 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 3. Seed Treatment Summary

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