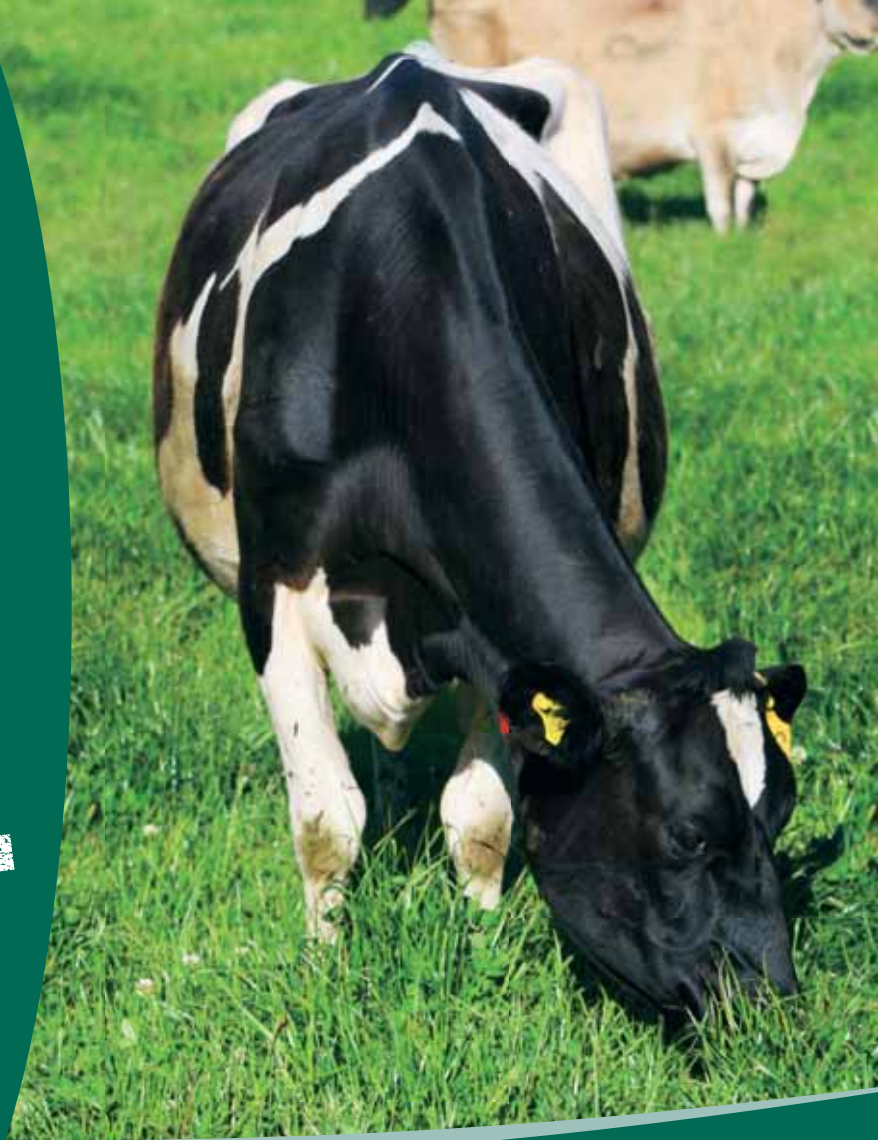


DAIRY PASTURE SOWING GUIDE

AUTUMN 2010



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** is the right endophyte for you.

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

In pest-prone areas, **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 may still be needed 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 re-renewal season.

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Priority Partnership® points are attributed to the following Agricom products: **Commando AR37**, **ONE⁵⁰ AR1**, **ONE⁵⁰ LE**, and **Warrior**.



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

The AR37 Advantage

AR37 is the latest novel endophyte developed by AgResearch Grasslands. It is a major breakthrough because 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.



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

To date no ryegrass staggers have been reported on dairy cows or any class of cattle grazing **AR37** ryegrass (see also page 3).

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 4), **Samson** and **Halo** perennial ryegrasses and **Ohau** (page 6) long-rotation ryegrass.



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

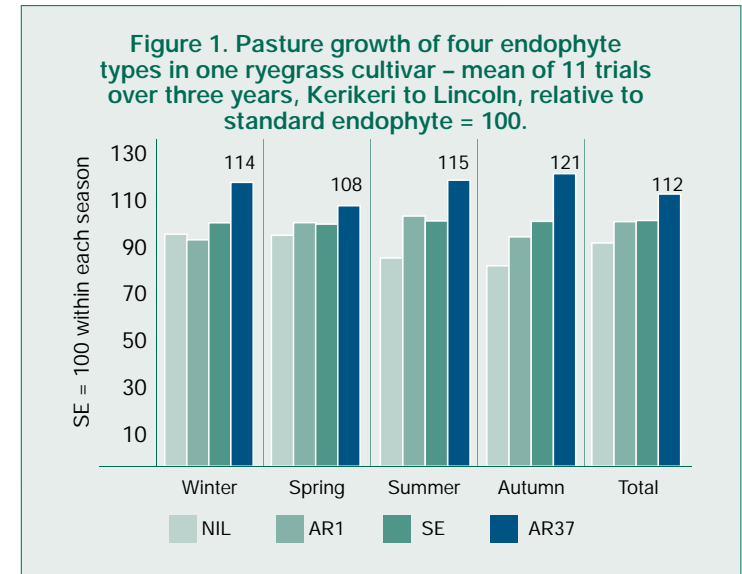


Pasture Mealy Bug
New Zealand wide



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

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



AR37 – DairyNZ Endophyte research

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.

After 3 years of the trial looking at pastures with **AR37**, **AR1**, standard (HE) or without (nil). 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.

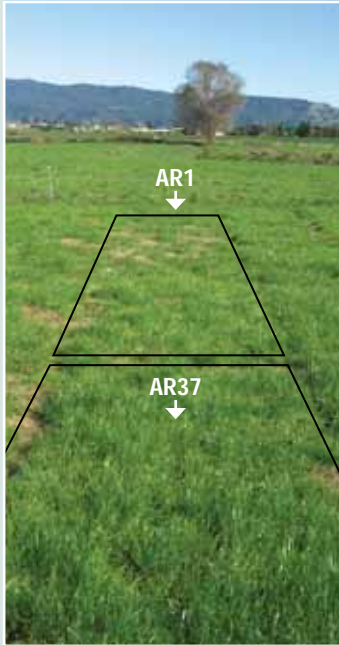


2. The greater persistency translated into a reduced need for renovation of **AR37** pastures after the 2008 drought, but in the three years before that time there was no difference in total pasture yield.
3. There was no sign of ryegrass staggers or any other animal health issues in cows grazing **AR1** 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 ryegrass 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.



Agricom's Bay of Plenty Demonstration Site, post 2008 drought, 24 months after sowing, the same variety with **AR37** foreground and with **AR1** background.



Persistent where others fail
 Patetonga (Waikato) dairy farmer John Drent estimates he lost at least ten percent of his production when bugs, black beetles and crickets, followed by drought, wiped out large areas of his pasture over five years.

"We had previously planted pasture which we thought would be more suited to the animals, but with the drought conditions plus a high bug loading, it all failed."

Three seasons ago they under-sowed about 60 per cent of the farm with **Commando AR37**, and John says they are impressed.

"At this point the **Commando AR37** is performing well. I believe the paddock is still under attack by the beetles, but nowhere to the same extent as the other varieties."

John is happy to report they have gained back the higher levels of production with **Commando AR37**. "We are really happy with **Commando AR37** and will keep using it for sure."

Persistent Perennial Pasture

"Persistence and excellent early-spring growth"

- Available with **AR37** and **AR1** novel endophyte and LE
- Very 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 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**.



persistent performance



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.



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.



ONE⁵⁰ Tougling it out

Dannevirke dairy farmer Shane Broad laughs when people complain about farming in tough conditions. His new farm shed is on its third rebuild after only 18 months, each time due to wind damage.

Traditionally using short-term grasses, Shane says he was looking for a permanent grass that would cope with the tough conditions and provide good winter, spring and summer growth, so he drilled 20 ha of ONE⁵⁰ in autumn 2008.

“It was a real eye-opener in summer,” Shane says. “It doesn’t open up as much through summer, so we’re finding it’s not getting the weeds that we were experiencing with the short-term grasses. Its performance through winter is really impressive as well.”

This spring Shane says he will sow 30 ha of turnips. “I’m so confident in ONE⁵⁰ that I will be using it to sow that 30 ha as well,” he says. “I wouldn’t use anything else.”

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

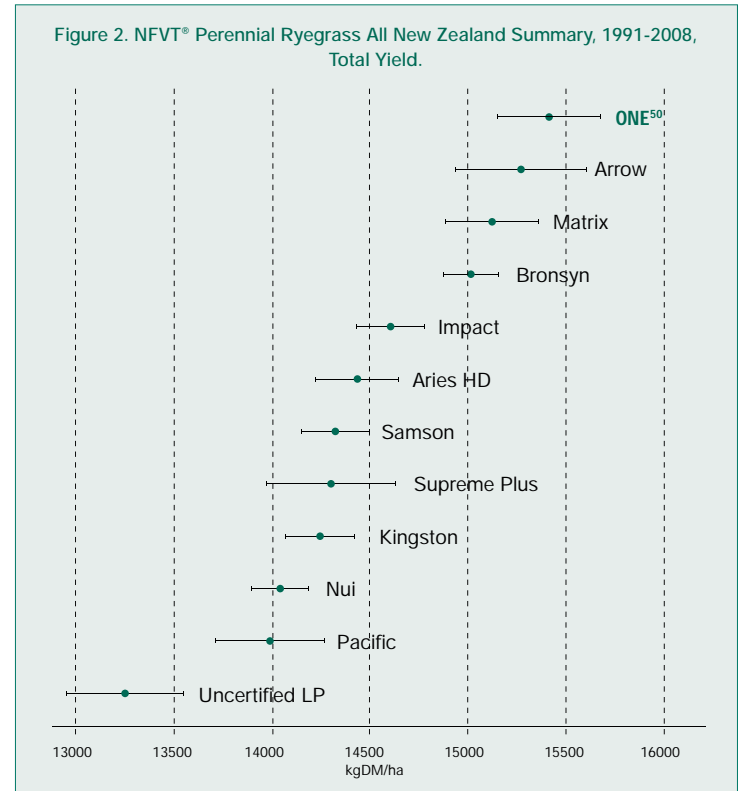
ONE⁵⁰ is a cross of elite genetics of New Zealand and North West Spanish origin. It was bred using individual plants that were screened in the pest and rust-prone north of New Zealand. ONE⁵⁰ is a late-heading, diploid perennial ryegrass of medium leaf and tiller size.

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.





New 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

Get more from your undersowing

Ohau AR37 is the new tool when under-sowing 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, mealy bug, root aphid, or porina, which means their regular use provides the perfect pastures



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

**ideal. for
undersowing**

for maintaining high populations of any of these insect pests. As a result, the new grasses are frustratingly short-lived.

Ohau AR37 provides a great balance between invigorating your pasture by undersowing, but also providing superior insect protection and persistence. The **AR37** endophyte is essentially 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 left).

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.

Suggested Undersowing Mix	
Cultivar	kg/ha
Ohau AR37 Superstrike* ryegrass	16-25
Tribute white clover	3
Emerald white clover	2
TOTAL	21-30

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



Italian ryegrass has traditionally been sown with the aim of bolstering winter and spring feed reserves – a critical period for feed on most dairy farms.

A typical approach would be to use **Warrior** Italian ryegrass as a “break crop” leading into the sowing of a new perennial pasture. A multi-spray approach (glyphosate) pre- and post-Italian ryegrass brings the added advantage of a near complete grass and weed kill, which allows the new pasture to establish more successfully. This spray-out process also provides the opportunity to more effectively remove high endophyte ryegrass – the likely “resident pasture” for many dairying environments in New Zealand and replace with new highly productive novel endophyte pastures such as varieties with **AR37** endophyte.

Less effective but still commonly practiced, is to “stitch into” existing pastures to make that pasture more productive for the next 12-24 months until those paddocks fall into the pasture renewal programme.

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

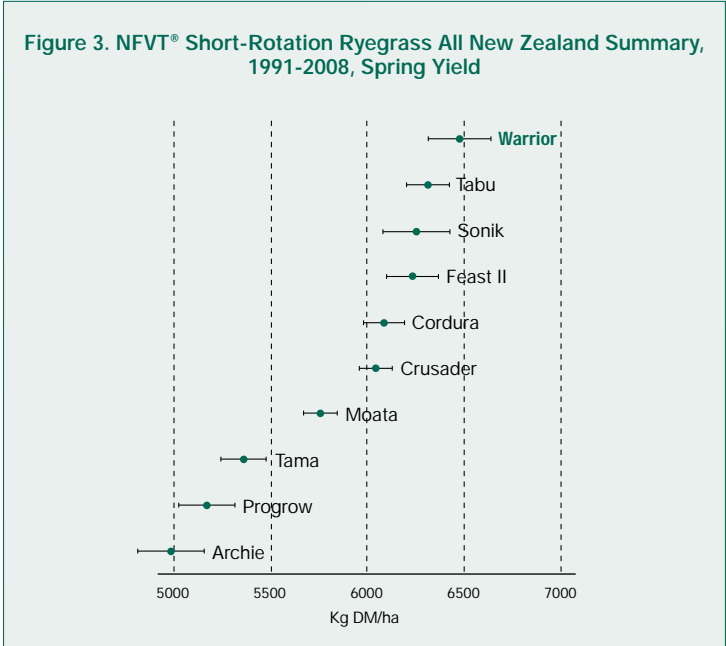
Bred for production

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.

Performance

Warrior has performed exceptionally well in independent trials for pasture production, and rust tolerance. **Warrior** has strong production over the spring (Figure 3) 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.



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

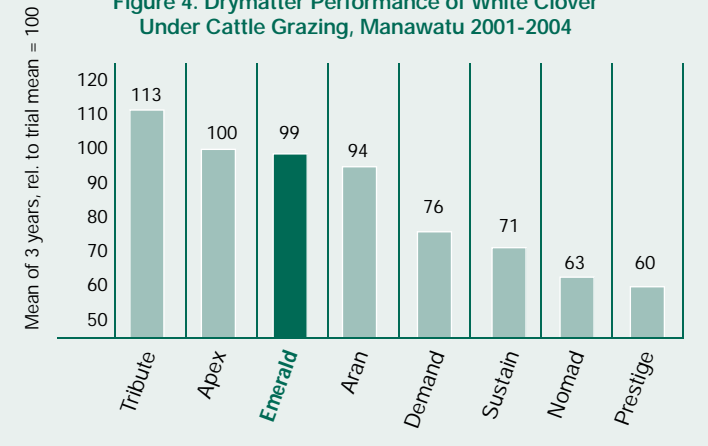
An Ideal White Clover For Dairy Cows

“Large-leaved, high production”

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

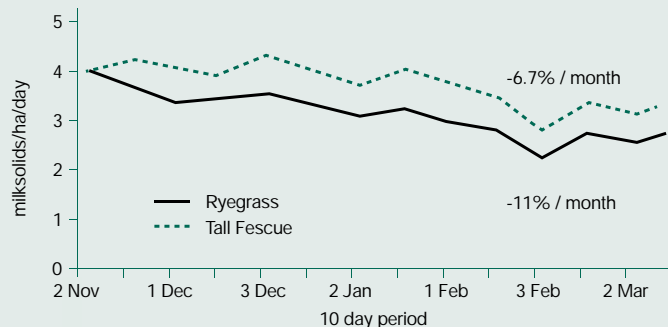
Emerald is the latest large-leaved cultivar bred by AgResearch Grasslands. It has very high production as well as a high stolon density, making it ideal for dairy and other high performance pastures. The vigorous establishment of **Emerald** makes it a preferred clover when sowing with high producing,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

Figure 4. Drymatter Performance of White Clover Under Cattle Grazing, Manawatu 2001-2004



Tall Fescue – An Alternative to Ryegrass

Figure 5. Milk solids production from two pasture types during herd split – R & M Shaw, 1995/96



Farmers often ask for a ryegrass that is more persistent and drought tolerant than the ryegrasses that are currently available. This already exists, but is called **Advance MaxP** tall fescue.

While **Advance MaxP** tall fescue is not a ryegrass, it is used in much the same way, and also fulfils the grazing and production needs of a dairy farm. **Advance MaxP** has deeper roots, better summer growth and heat tolerance, and this enables it to convert rainfall into a greater amount of energy and milk production. Winter and spring growth is similar to perennial ryegrass, and increased milk production is most notable over summer and autumn (Figure 5). This extra production is a result

of both improved feed quality and pasture growth.

Advance MaxP tall fescue also has better persistence and drought tolerance than many ryegrasses currently marketed. It is tolerant of all the insects that AR1-infected ryegrass is, but also black beetle, grass grub, porina and root aphid. Although drought tolerant, tall fescue is well suited to wet and heavy soils.

Tall fescue requires good establishment methods for high success, where paddocks are grazed at a pre-determined maximum cover. Download our tall fescue management guide for more details www.agricom.co.nz/fescue.

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** 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 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

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 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 2. 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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