# FARM SOURCE PASTURE GUIDE

2023

FARM SOURCE
Fonterra
Dairy for life

nzfarmsource.co.nz | 0800 65 65 68

**Productive pasture is key to a successful dairy farm so there's much to consider when choosing seed: annuals, Italians, hybrids, perennials, clovers, chicory, plantain.**

Your Farm Source team can provide pasture and crop options for you to suit local conditions. Plus, your local TSR can visit to make a recommendation about your options, taking into account the individual factors affecting your farm.

Our TSR's are out on-farm all year round talking with specialists, industry organisations and contractors in the field. They regularly receive information about the best pasture solutions for your area which take into account climate, soil type and the DairyNZ Forage Value Index.

Whether you are renewing pastures post crop or improving existing pasture, we have varieties and advice for your situation.

## CALL YOUR LOCAL TSR TODAY

No TSR? call 0800 731 266 and we can help with that.

# CONTENTS

# IDENTIFYING PASTURE FOR RENEWAL

**The best paddock(s) to renew are the poorest producers as these have the potential for greatest improvement. Highest producing paddocks on a farm indicate the property's overall potential.**

For example, where the yield can be increased by 2t DM/ha the return is around 130kg MS/ha. The return will be greater if the extra growth occurs at a time of the season when animal demand exceeds pasture growth.

Use grazing and yield records to identify your best and worst paddocks. The more measures and assessments you have to compare the better (and easier) the decision will be.

If records are unavailable use the Pasture Condition Score Tool on the next page.

Once you have scored your paddocks and know which need re-grassing, your TSR can help you to work out why these paddocks are struggling. Introducing new plants will not increase production if you do not resolve the underlying causes of low pasture production – treat the cause and not the symptom.

## EXAMPLE OF RECORDING GRAZINGS

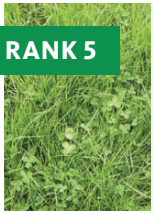
| Paddock | Grazing Days in each Paddock | Plus equivalent days of silage made | Total grazing days per paddock* |
|---|---|---|---|
| A | 11 | 2 | 13.0 |
| B | 8 | 2 | 10.0 |
| C | 7 | 0 | 7.0 |

*providing paddocks are of similar size and managed similarly.

Any weeds in your pasture are stealing fertility, moisture and valuable space that should be growing quality pasture. Your local TSR can help make plans to avoid getting to this point or fix any issues which may exist.

# PASTURE CONDITION SCORING TOOL

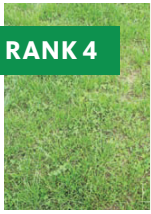
**The Pasture Condition Score Tool helps determine what action to take to improve your pasture depending on its condition. Assess each paddock on the farm and give a score from 1 to 5 using the photos and descriptions below. Consider the suggested actions to develop an action plan for each paddock.**



## RANK 5

**Description:** Whole paddock has dense sward of desired grasses and clovers.

**Suggested Actions:** No action required, would be happy if the whole farm was in this state.



## RANK 4

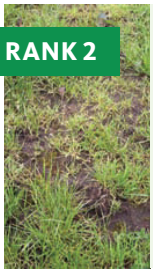
**Description:** Parts of the paddock shows signs of low level damage, less vigorous grasses and some weeds.

**Suggested Actions:** Check fertility. Apply N (nitrogen) to encourage tillering. Paddock probably OK for coming season.

## RANK 3

**Description:** Majority of paddock has low level damage, some weeds, and less vigorous grasses.

**Suggested Actions:** Apply N fertiliser. Undersow pasture with perennial ryegrass or longer lasting hybrid ryegrass containing appropriate endophyte to thicken the ryegrass content of the pasture, and so suppress weeds.



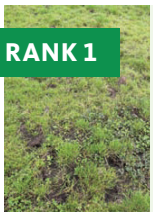
## RANK 2

**Description:** Parts of the paddock have severe damage, a lot of weeds and bare ground.

**Suggested Actions:** Either;

a. Sow into an annual rye grass and crop this coming spring, or;

b. Undersow with Italian ryegrass in autumn, and plan to renew in following 6-12 months.



## RANK 1

**Description:** Entire paddock severely damaged.

**Suggested Actions:** Sow into an annual rye grass and crop in spring.

# FORAGE VALUE INDEX (FVI) OVERVIEW


**The DairyNZ Forage Value Index (FVI) is an independent, profit-based index that compares short-term and perennial ryegrass cultivars. The tool allows farmers to make more informed, confident, and profitable decisions when choosing ryegrass cultivars for their pasture renewal programme.**

The FVI values the amount and quality of the feed grown from different ryegrass cultivars in a seasonal supply dairy farm system across four different regions of New Zealand.

Three different categories are used, "Winter feed" which compares ryegrasses from autumn sowing through to spring, "12 month pasture" which looks at performance from an autumn to autumn sowing, and "Perennial ryegrass" for permanent pasture sowings.

The perennial ryegrass FVI initially used only seasonal dry matter (DM) yield from three-year National Forage Variety Trials, but these results now include seasonal metabolisable energy (ME) content and some persistence traits. Consequently, farmers can select their top perennial ryegrass cultivars based on seasonal DM, seasonal ME and persistence combined.

The overall FVI calculated for each cultivar is converted into a star rating to represent its rank in the FVI. Results are presented using a 1-to-5 star rating in the Cultivar Selector Tool. Top cultivars receive 5 stars and the bottom cultivars receive 1 star.

The FVI will steadily strengthen over time as more research is carried out to ensure more trait and cultivar-specific data are included.

## FIND OUT MORE

For more information on the FVI and Cultivar Selector Tool visit:
**dairynz.co.nz/about-fvi/**

# PASTURE & CLOVER SEED QUICK REFERENCE

## ANNUALS | 6-9 Months

Annuals are a winter active 6-8 month option. They are highly valued for their winter and early spring production. Often planted prior to cropping or between crops. They typically establish very quickly so can be ready for their 1st grazing at 6 weeks. Be aware of nitrate poisoning.

| NAME | RYEGRASS TYPE | VENDOR | HEADING DATE |
|---|---|---|---|
| Hogan | Tetraploid | Barenbrug | +16 |
| Winter Star II | Tetraploid | PGG Wrightson | +9 |
| Tama | Tetraploid | Common | +14 |

## ITALIAN | 12 Months Plus

Italians are similar in establishment and winter growth as an annual but will last from 18 months or longer with good conditions.
Excellent to use for undersowing or if you're undecided on cropping.

| NAME | RYEGRASS TYPE | VENDOR | HEADING DATE |
|---|---|---|---|
| Tabu+ | Diploid | Barenbrug | +11 |
| Asset AR37 | Diploid | Agricom | +14 |
| Lush AR37 | Tetraploid | PGG Wrightson | +12 |

## HYBRID | Long Rotation 2-5 Years

Hybrids have perennial and Italian parentage and typically last 3 years, longer in good conditions. Ideal for undersowing or a “crop” of grass. Better winter growth and faster establishment than perennials but more persistent then an Italian. Advantage of endophyte too!

| NAME | RYEGRASS TYPE | VENDOR | HEADING DATE | PERSISTENCE |
|---|---|---|---|---|
| Forge NEA | Tetraploid | Barenbrug | +11 | 3-5 years |
| Shogun NEA12 | Tetraploid | Barenbrug | +13 | 2-3 years |
| Mohaka AR37 | Tetraploid | Agricom | +20 | 2-4 years |

## PERENNIALS

Pasture packs come with mixture of grass seed and clover. Most pasture packs are Diploid ryegrass so typically planted at a 25kg bag per ha.
Pasture packs with Tetraploid ryegrass are sown at a higher rate. For undersowing Diploid ryegrass sow at 10-15kg/ha, Tetraploids at 18-25kg/ha.

| NAME | RYEGRASS TYPE | VENDOR | HEADING DATE | PASTURE PACK |
|---|---|---|---|---|
| Array NEA2 | Diploid | Barenbrug | +23 | |
| Maxsyn NEA4 | Diploid | Barenbrug | +8 | Purple, Orange |
| Governor AR37 or AR1 | Diploid | Barenbrug | +8 | Gold II |
| 4front NEA2 | Tetraploid | Barenbrug | +15 | Yellow, Orange |
| Legion AR1 & AR37 | Diploid | Agricom | +12-14 | Teal |
| One50 AR37, AR1 & LE | Diploid | Agricom | +20 | Burgundy |
| Reason AR37 | Diploid | Agricom | +3 | |
| Excess AR37 & AR1 | Diploid | PGG Wrightson | +7 | Red |
| Base AR37 & AR1 | Tetraploid | PGG Wrightson | +22 | |
| Platform AR37& AR1 | Diploid | PGG Wrightson | +12 | Blue |

## CLOVERS

White clovers are typically sown at around 4kg/ha in a pasture mix. Usually with a 2kg:2kg mix of large and medium leaved clovers.

Red clovers are typically sown at 4-6kg/ha.

| NAME | VENDOR | NAME | VENDOR |
|---|---|---|---|
| Kotuku (Large Leaf Type) | Barenbrug | Mainstay | Agricom |
| Ruru (Medium Leaf Type) | Barenbrug | Tribute | Agricom |
| Legacy (Large Leaf Type) | PGG Wrightsons | Relish Red Clover | Agricom |
| Quartz (Medium Leaf Type) | PGG Wrightsons | Morrow Red Clover | Barenbrug |
| Brace (Large Leaf Type) | Agricom | | |

# PASTURE GLOSSARY

## RYEGRASS VARIETIES

- **Annual Ryegrass**
  Similar to an Italian ryegrass with fast establishment, good winter feed growth and value which generally persists for 6-9 months.
- **Italian Ryegrass**
  Italian ryegrasses are natural bi-annuals, they are characterised by a strong establishment and last 12-18 months or longer depending on conditions. Generally more persistent than annual ryegrass.
- **Hybrid Ryegrass**
  Generally derived from crossing perennial ryegrass and Italian ryegrass. Good feed quality and winter growth. Typically persist from 2-5 years, depending on conditions, grass genetics and endophyte.
- **Perennial Ryegrass**
  Excellent base for permanent pasture mix, with good stock palatability and establishes well. The most commonly used permanent pasture grass in New Zealand.

## DIPLOID VS. TETRAPLOID

The main difference between diploid and tetraploid ryegrass is their palatability and feed value (ME), with tetraploids easier to graze with a higher pasture quality than a similarly managed diploid ryegrass.

Tetraploid ryegrasses are naturally higher in sugars which makes them more palatable to livestock and improves intake and production.

Tetraploids have four sets of chromosomes per cell, with diploid ryegrasses having only two sets of chromosomes per cell.

Diploids combine yield and robustness. They have more tillers per plant and due to the lower water content per cell have a higher dry matter per kg of feed. Most ryegrass and red clovers cultivars are diploid.

## ENDOPHYTE TYPES

An endophyte is a fungus found in many grass species including ryegrass. It provides the plant with protection from insects. There are several types of endophytes available, understanding which is more suitable for your farm system will help you to maximise productivity.

## SEED TREATMENT

Seed treatment is the process of coating individual seeds with a mix of chemicals to protect and help ensure good establishment. The coatings contain insecticide and fungicide to help protect young plants from insect attack and disease and will last approximately six weeks post-sowing. Seed treatment gives good control of low to moderate insect pressure.

Treated seed may not be suitable in all situations or a wider control programme may be required. For more information contact your local Farm Source TSR.

## CUSTOM MIXING

Growing the right pasture, at the right time, in the quantities you need is all part of the equation.

We know it takes a great deal of hard work and planning – from your renewal programme and choice of seed, to dealing with a variety of weed types – and we're here to help.

Farm Source can custom mix seed for you using our access to all the seed varieties and expertise from leading seed production companies including Barenbrug, Agricom, PGG Wrightson Seeds and Seed Force.

We'll work to ensure you get the pasture that meets your requirements. Your local TSR can visit to make a recommendation about your pasture options, taking into account the individual factors and environmental situation affecting your farm.

## PASTURE PACKS

Alternatively, we've a range of ready made pasture packs available.

Each of our Farm Source Pasture Packs contain a specialised mix of seed to meet the variations in insect control, climate, soil type, paddock use and farm facilities to deliver the best possible results.

All seed in our Pasture Packs have been cool stored in facilities that exceed industry standards and have been tested to ensure high levels of active endophyte.

**Read more on the following pages or contact your local TSR for more information and availability.**

# ECOTAIN® ENVIRONMENTAL PLANTAIN

**Ecotain® environmental plantain significantly reduces nitrogen leaching without compromising production.**

## THE SCIENCE

Research has demonstrated that not all plantains (current cultivars or breeding lines) are capable of reducing nitrate leaching from the urine patch through the four aspects Ecotain can – dilute, reduce, delay and restrict. Work by Massey and Lincoln universities, along with Plant and Food Research and Agricom have shown that Ecotain increases the volume of cows' urine which dilutes the concentration of nitrogen, it reduces the total amount of nitrogen in animals' urine, it delays the process of turning ammonium into nitrate in the urine patch, and it restricts the accumulation of nitrate in Ecotain-growing soil. With the potential to reduce nitrogen leaching by up to 89% from the urine patch, Ecotain is an excellent mitigation tool.

Winter dormant plantain (left) with Ecotain® environmental plantain (right). Photo taken 28 June 2018.

Ecotain® environmental plantain.

## AGRONOMICS

In addition to being a highly effective nitrogen leaching mitigation technology; Ecotain is an excellent forage, providing winter activity and drought tolerance, along with animal health performance benefits across virtually all high performing, pastoral based farm systems.

## IMPLEMENTATION

The easiest way to get Ecotain on farm is to sow it with new perennial pastures. Pasture mixes that include Ecotain can be established the same way as ryegrass/white clover pastures, and the environmental effectiveness of new pastures is very high.

Undersowing via direct drilling or broadcasting into damaged and open pastures works well to extend the life of pastures as well as providing environmental benefits, and broadcasting Ecotain is a useful addition when applying fertiliser. When utilising this technique, it is important to remember that the success of broadcasting will be based on the openness of pasture.

Ecotain dominant stands, or Ecotain stands with clover are also effective implementation strategies. An Ecotain dominant stand provides high and consistent levels of Ecotain content and fits very well as a short rotation pasture or as a break crop in a pasture renovation programme (similar in use to Italian or hybrid pastures). Including clover is ideal for 2-3 year lactation feeding or an inter-crop restorative phase.

# HYBRID RYEGRASS

**Hybrid ryegrasses are bred from perennial ryegrass and Italian ryegrass to combine the best features of both parent species.**

They range from types that resemble Italian ryegrass more (traditionally known as short-rotation ryegrasses), with high yields of larger-leaved forage, persisting from 2-4 years, to types almost as persistent as perennial ryegrass (traditionally called long-rotation ryegrass). Some cultivars may contain the same endophyte as described for perennial ryegrass.

Hybrid ryegrasses are frequently added to perennial pasture seed mixtures to provide increased winter production during the first few years and to boost animal performance in cooler regions. They are commonly sown in late summer/autumn to provide increased winter/early spring production.

## SUGGESTED SOWING RATES:

Hybrid ryegrass are usually Tetraploids, with large seeds. Therefore a full sward would be planted at 30-35kg/ha. A Diploid would be planted at 20-30kg/ha. Hybrids are a great option to be undersown into perennial pastures at 13-18kg/ha for Tetraploids or 10-15kg/ha for Diploids.

## THE FORGE ADVANTAGE
### OUR RECOMMENDED HYBRID RYEGRASS

Forge is a breakthrough 3-5 year hybrid ryegrass that outgrows perennial, and opens new opportunities for high performance medium-term pasture.

Thicker, longer lasting Forge is denser, and more persistent than Shogun, with more tillers.

**Grows more, year round**

Annual DM yield for Forge is unbeaten. It has grown at least 14% more than other cultivars in NFVT trials.

**Adaptive**

Much of Forge's yield advantage over perennials (+1.6 t DM/ha/year) comes in autumn, winter and early spring. In regions where milder winters and hotter summers are becoming more common, this helps maximise cool season growth and MS production pre-Christmas.

**Easy grazing**

Animals love tetraploids – they are soft, legume-friendly, rich in energy and easy to eat. Forge's ME and palatability encourage high intakes, optimal per head performance and improved efficiency. It's easier to manage, too.

**Lighter footprint**

Tetraploids can be grazed at higher covers, so you can grow more pasture, or it can be turned into an environmental benefit through growing the same amount of pasture for less N fertiliser. Also, most N loss occurs in the cool season when soils are saturated. Forge's extra winter yield better mitigates this.

**Please note we have limited supply of Forge for the current season, talk to your local TSR for options.**

**Exceptional DM yield • Adaptive • Easy Grazing • Less N Fertilizer**

## PASTURE LONGEVITY

| | | |
|---|---|---|
| Tabu+ = 12-18 months | Shogun = 2-3 years | Forge = 3-5 years |

# DIVERSE PASTURE MIX

**This mix is for farmers looking to sow a pasture with a diverse range of species, with different grasses, clovers and herbs.**

## BENEFITS

- It has the densely tillered and high yielding Maxsyn NEA4 perennial ryegrass along with the very persistent Rohan NEA2 spreading perennial ryegrass.
- Safin superfine cocksfoot, Bareno pasture brome and timothy provide diversity in stock diet, and good growth on the shoulders of the season.
- The top yielding Tabu+ increases DM yield through establishment and the first winter.
- The top performing white, red and annual clovers increase the feed quality, and provide extra nitrogen fixation. Annual clovers and Coolamon improve the spring clover content.
- The deep taproot of both Morrow red clover and 501 chicory increases forage production, and ME and protein in summer.
- Captain plantain supplies diet diversity for stock, and the environmental benefits of lower N footprint.

## SOWING RATE

- 36kg/ha = 1.4 bags/ha.
- Available as treated or bare (untreated) seed.

## MANAGEMENT TIPS

- With limited weed control options, more careful paddock choice is required to reduce the risk of perennial weeds becoming present.
- It is also important to have a well-prepared seed bed and weed control programme prior to sowing this.
- No specific differences from a standard mix, with regards to nutrient applications, however having a good base of soil nutrient status will aid with the performance of all the species.

BARENBRUG

# DIVERSE PASTURE MIX

| CULTIVAR | TREATED/BARE | KG/BAG |
|---|---|---|
| Maxsyn NEA4 Perennial Ryegrass | TREATED | 5 |
| Safin Superfine Cocksfoot | TREATED | 3 |
| Rohan NEA2 SPR Perennial Ryegrass | TREATED | 2 |
| Timothy | TREATED | 1 |
| Bareno Pasture Brome | BARE | 3 |
| Tabu + Italian Ryegrass | TREATED | 2 |
| Kotuku White Clover | TREATED | 1 |
| Ruru White Clover | TREATED | 1 |
| Morrow MS Red Clover | TREATED | 3 |
| Laser Persian Clover | TREATED | 1 |
| Coolamon Sub Clover | TREATED | 1 |
| 501 Chicory | TREATED | 1 |
| Captain CSP Plantain | TREATED | 1 |

## SOWING GUIDE

| SITUATION | SOWING RATE KG/HA |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 36kg |
| Direct drilling — Sprayed out pasture | 36kg |

| CULTIVAR | KILOS PER | |
|---|---|---|
| | BAG | HA |
| Maxsyn NEA4 Perininal Ryegrass | 5 | 6 |
| Safin superfine cocksfoot | 3 | 4 |
| Rohan NEA2 SPR perennial ryegrass | 2 | 2 |
| Timothy pasture | 1 | 1 |
| Bareno pasture brome | 3 | 4 |
| Tabu+ Italian ryegrass | 2 | 2 |
| Kotuku white clover | 1 | 1 |
| Ruru white clover | 1 | 1 |
| Morrow MS red clover | 3 | 4 |
| Laser Persian clover | 1 | 1 |
| Coolamon sub clover | 1 | 1 |
| 501 chicory | 1 | 1 |
| Captain CSP plantain | 1 | 1 |
| **Total** | **25** | **36** |

# FARM SOURCE PASTURE PACKS

Each of our Farm Source Pasture Packs contain a specialised mix of seed to meet the variations in insect control, climate, soil type, paddock use and farm facilities to deliver the best possible results.

All seed in our Pasture Packs have been cool stored in facilities that exceed industry standards and have been tested to ensure high levels of active endophyte.

# YELLOW PACK

NEA2

**RYEGRASS TYPE:** Tetraploid Perennial

**ENDOPHYTE OPTIONS:** NEA2

**SEED TREATMENT OPTIONS:** Agricote Treated

**HEADING DATE:** Late +15 Days

| | | |
|---|---|---|
| **4FRONT** (NEA2) \| Perennial Ryegrass | **TREATED** | **22**kg |
| **KOTUKU** \| White Clover | **TREATED** | **1**kg |
| **RURU** \| White Clover | **TREATED** | **2**kg |

| SITUATION | SOWING RATE |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 30-35kg |
| Direct drilling — sprayed out pasture | 30-35kg |
| Undersowing — into existing pasture | 20-25kg |

The Yellow pack suits farm systems targeting high animal performance providing high quality and high yield across all seasons.

- This pack contains the class-leading 4front, which is the unbeaten tetraploid perennial ryegrass in the Industry National Forage Variety Trials, and rated 5-stars cultivar in the DairyNZ Forage Value Index across all New Zealand regions.
- 4front has very high palatability and ME, so can increase animal intakes and performance.
- Grazed well it can improve your environmental outcomes, through reducing N leaching and GHG (greenhouse gas) production. Go to the Barenbrug New Zealand website for further information.
- It contains the NEA2 endophyte, for superior animal performance and great insect control.
- This pack contains the high performance white clover combination of Kotuku and Ruru. Kotuku is a large leaved clover with exceptional DM yield, and Ruru is a new medium leaved with excellent persistence and delivering extra summer yield and protein.

NOTE: Grass is also available as a straight line or for custom mixing if required.

# ORANGE PACK

NEA4 NEA2

**RYEGRASS TYPE:** Tetraploid/Diploid Perennial Mix

**ENDOPHYTE OPTIONS:** NEA4 (Maxsyn), NEA2 (4front)

**SEED TREATMENT OPTIONS:** Agricote Treated

**HEADING DATE:** Late +15 Days (4front), +8 Days (Maxsyn)

| | | |
|---|---|---|
| **MAXSYN** (NEA4) \| Perennial Ryegrass | **TREATED** | **9**kg |
| **4FRONT** (NEA2) \| Perennial Ryegrass | **TREATED** | **13**kg |
| **KOTUKU** \| White Clover | **TREATED** | **1**kg |
| **RURU** \| White Clover | **TREATED** | **2**kg |

| SITUATION | SOWING RATE |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 29-32kg |
| Direct drilling — sprayed out pasture | 29kg |
| Undersowing — into existing pasture | 15-20kg |

The Orange Pack is a unique combination of tetraploid and diploid perennial ryegrasses, providing a great balance of high palatability, density and persistence.

- Maxsyn and 4front have proven themselves as class leading performers for diploid and tetraploid perennial ryegrass respectively.
- 4front has very high palatability and ME so can increase animal intakes, animal performance and environmental outcomes. But straight tetraploids don't suit every farm, so we've added diploid Maxsyn to increase pasture density and robustness. For many this mix provides a near ideal balance of animal performance and long term yield.
- Maxsyn contains NEA4 endophyte, and 4front NEA2, both providing superior animal performance and good insect control.
- This pack contains the high performance white clover combination of Kotuku and Ruru. Kotuku is a large leaved clover with exceptional DM yield, and Ruru is a new medium leaved with excellent persistence and delivering extra summer yield and protein.

NOTE: Grass is also available as a straight line or for custom mixing if required.

# PURPLE PACK

NEA4

**RYEGRASS TYPE:** Diploid Perennial

**ENDOPHYTE OPTIONS:** NEA4

**SEED TREATMENT OPTIONS:** Agricote Treated

**HEADING DATE:** Mid-Late +8 Days

| | | |
|---|---|---|
| **MAXSYN** (NEA4) \| Perennial Ryegrass | **TREATED** | **21**kg |
| **KOTUKU** \| White Clover | **TREATED** | **2**kg |
| **RURU** \| White Clover | **TREATED** | **2**kg |

| SITUATION | SOWING RATE |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 25-30kg |
| Direct drilling — sprayed out pasture | 25kg |
| Undersowing — into existing pasture | 15-20kg |

The Purple Pack is the Next Gen in pasture for high performance farm systems, delivering very strong persistence and superior growth, with an animal-safe endophyte.

- Maxsyn NEA4 sets a new level of DM yield, with its key strength in summer and autumn. Superior tillering through summer helps persistence, and improves autumn growth, while providing extra warm season feed when needed. Visually you can see the difference, with Maxsyn holding its green colour longer into hot summer conditions.
- Maxsyn is densely tillered and easier to graze in spring, encouraging the development of new daughter tillers for the coming season, again enhancing persistence and yield. NEA4 endophyte provides very good insect control, while being staggers-safe for dairy cows and cattle.
- The Purple Pack contains the high performance white clover combination of Kotuku and Ruru. Kotuku is a large leaved clover with exceptional DM yield, and Ruru is a new medium leaved with excellent persistence and delivering extra summer yield and protein.

# BLUE PACK

**RYEGRASS TYPE:** Diploid Perennial

**ENDOPHYTE OPTIONS:** AR37

**SEED TREATMENT OPTIONS:** Agricote Treated

**HEADING DATE:** Late +12 Days

| | | |
|---|---|---|
| **PLATFORM** \| Perennial Ryegrass | **TREATED** | **21**kg |
| **KOTUKU** \| White Clover | **TREATED** | **2**kg |
| **RURU** \| White Clover | **TREATED** | **2**kg |

| SITUATION | SOWING RATE |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 25-30kg |
| Direct drilling — sprayed out pasture | 25kg |
| Undersowing — into existing pasture | 15-20kg |

The Blue Pack suits farm systems desiring strong year round production with noted quality and persistence.

- Platform is a diploid perennial ryegrass, with high year round dry matter production and noted cool season activity.
- Platform's late heading date (12 days later than Nui) combined with a dense fine leaf structure and low aftermath seed head production produces quality feed to assist with the maintenance of peak milk production.
- A top performing cultivar in independent National Forage Variety Trials and DairyNZ Forage Value Index 4-Star status in the lower North Island.
- Platform contains AR37 providing protection from major pasture pest including Black Beetle, Porina, Argentine Stem Weevil larvae, Root Aphid and Pasture Mealy Bug.
- Bred from a combination of elite New Zealand genetics and North-west Spanish material that has undergone testing and selection to ensure adaptability across New Zealand.

NOTE: Grass is also available as a straight line or for custom mixing if required.

# GOLD II PACK

**RYEGRASS TYPE:** Diploid Perennial

**ENDOPHYTE OPTIONS:** AR37

**SEED TREATMENT OPTIONS:** Agricote Treated or Bare

**HEADING DATE:** Late +8 Days

| | | |
|---|---|---|
| **GOVERNOR** \| Perennial Ryegrass | **TREATED** | **21**kg |
| **KOTUKU** \| White Clover | **TREATED** | **2**kg |
| **RURU** \| White Clover | **TREATED** | **2**kg |

| SITUATION | SOWING RATE |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 25-30kg |
| Direct drilling — sprayed out pasture | 25kg |
| Undersowing — into existing pasture | 15-20kg |

The Gold II Pack has proven its performance across many farm systems, helping to provide year round yield and a robust, high feed value pasture.

- Includes Governor AR37 a fine leaved, dense and persistent perennial ryegrass that's proven to be a great all-round pasture, with good spring and autumn yield. It's fine dense habit can help in wet situations, giving more soil protection against treading damage.
- The Gold II pack has AR37 endophyte, so is particularly suited to areas affected by porina, although should not be considered a stand alone defence against porina.
- AR37 endophyte is not recommended for pasture grazed by deer or horses due to the risk of ryegrass staggers.
- This pack contains the high performance white clover combination of Kotuku and Ruru. Kotuku is a large leaved clover with exceptional DM yield, and Ruru is a new medium leaved with excellent persistence and delivering extra summer yield and protein.

NOTE: Grass is also available as a straight line or for custom mixing if required.

# TEAL PACK

**RYEGRASS TYPE:** Perennial

**ENDOPHYTE OPTIONS:** AR37

**SEED TREATMENT OPTIONS:** Agricote Treated

**HEADING DATE:** Late +12-14 Days

| | | |
|---|---|---|
| **LEGION** \| Perennial Ryegrass | **TREATED** | **21**kg |
| **KOTUKU** \| White Clover | **TREATED** | **2**kg |
| **RURU** \| White Clover | **TREATED** | **2**kg |

| SITUATION | SOWING RATE |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 25-30kg |
| Direct drilling — sprayed out pasture | 25kg |
| Undersowing — into existing pasture | 15-20kg |

The Teal Pack contains Legion AR37 which was bred solely from late heading perennial ryegrass plants that have been individually screened for persistence, rust tolerance and vigour in Canterbury, Palmerston North, Waikato and Northland.

- Legion has been in 6 completed National Forage Variety Trials and is in 9 on going yield trials. Legion is a very high performing perennial ryegrass that is well suited to dairy pastures and runoffs. It is highly palatable, particularly in mid-summer when other ryegrass varieties may begin to clump due to residual seedhead development.
- Legion is a highly vegetative variety, with a thick growth density while also being fast to establish making it well suited to undersowing programmes.
- Legion has consistently been one of the top yield performers all year round, no matter the region, taking out the top spot for Autumn yields in the National Forage Variety Trails.
- Legion has extremely low aftermath heading for a perennial ryegrass and very high crown rust tolerance.
- AR37 endophyte offers long-term, natural protection to porina and rootaphid. It also provides very good control of Argentine stem weevil larvae while not compromising milk production.

# BURGUNDY PACK

**RYEGRASS TYPE:** Diploid Perennial

**ENDOPHYTE OPTIONS:** AR37

**SEED TREATMENT OPTIONS:** Treated

**HEADING DATE:** Late +20 Days

| | | |
|---|---|---|
| **ONE50** \| Perennial Ryegrass | **TREATED** | **21**kg |
| **KOTUKU** \| White Clover | **TREATED** | **2**kg |
| **RURU** \| White Clover | **TREATED** | **2**kg |

| SITUATION | SOWING RATE |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 25-30kg |
| Direct drilling — sprayed out pasture | 25kg |
| Undersowing — into existing pasture | 15-20kg |

The Burgundy Pack is suited to dairy farms, where yield advantages can be realised. One50 diploid perennial ryegrass provides excellent summer, autumn and winter production with year round quality and palatability.

- Due to it's proven performance, ONE50 has been the most preferred perennial ryegrass by New Zealand farmers for the last six years.
- Highly productive perennial ryegrass with the ability to stay green under summer stress, as well as exhibiting high rust tolerance.
- AR37 endophyte offers the best long-term natural protecting to pornia and root aphid. It also provides very good control of Argentine stem weevil larvae while not compromising milk production.

NOTE: Grass is also available as a straight line or for custom mixing if required.

# RED PACK

**RYEGRASS TYPE:** Diploid Perennial

**ENDOPHYTE OPTIONS:** AR37

**SEED TREATMENT OPTIONS:** Treated

**HEADING DATE:** Mid +7 Days

| | | |
|---|---|---|
| **EXCESS** \| Perennial Ryegrass | **TREATED** | **21**kg |
| **KOTUKU** \| White Clover | **TREATED** | **2**kg |
| **RURU** \| White Clover | **TREATED** | **2**kg |

| SITUATION | SOWING RATE |
|---|---|
| Drilling or broadcasting — cultivating seedbed | 25-30kg |
| Direct drilling — sprayed out pasture | 25kg |
| Undersowing — into existing pasture | 15-20kg |

The Red Pack suits farm systems desiring early season growth with strong year round production and persistence.

- Excess is a medium leaved diploid perennial ryegrass bred for high dry matter production and cool season growth.
- Well suited to challenging environments and soil types, providing an early flush of spring growth ideal for calving.
- A top performing cultivar in independent upper North Island National Forage Variety Trials.
- Excess contains AR37 providing a level of protection from major pasture pest including Black Beetle, Porina, Argentine Stem Weevil larvae, Root Aphid and Pasture Mealy Bug.

NOTE: Grass is also available as a straight line or for custom mixing if required.

# OTHER OPTIONS

## COCKSFOOT

Cocksfoot (Dactylis glomerata) is most persistent perennial grass that tolerates summer dry conditions, moderate soil fertility and insect attack. It is used to enhance the resilience of permanent pastures in hot, dry areas. It also adds variety to the stock diet.

Cocksfoot is slow to establish compared to ryegrass, so is often sown as part of a ryegrass pasture mix at 3-6 kg/ha. It has lower digestibility than ryegrass, with limited winter growth but good summer growth.

## NEW REDEFINE COCKSFOOT

We are pleased to offer this new cocksfoot, which is the ultimate mixer, making friends wherever it goes! It is significantly finer than any other cocksfoot, more compatible with other species in a pasture.

Old cocksfoot (top) can become low in crude protein and unpalatable. Redefine (below) is makes friends with legumes, so it's nicer to eat.

## TALL FESCUE

Tall Fescue (Festuca arundinacea) suits some situations but not others. It is a perennial grass more tolerant of hot summers and poorly drained soils. It is sensitive to soil temperature so must be sown when soil temperatures are above 12°C. It is slower to establish than ryegrass, so it is very important to have a good weed free seedbed.

In NZ Tall Fescue is mainly sown in dry areas for its summer growth and good clover content, performing best on clay soils, where its deeper rooting ability can utilise more soil moisture than ryegrass. It cannot be sown with ryegrass, as the ryegrass is much faster to establish and will dominate the pasture.

Tall fescue needs to be grazed at the correct time in spring, more frequently than ryegrass, to prevent a loss of feed quality.

Best sown at 20-25kg/ha with suitable white clovers.

## HOGAN

Hogan is the top performing annual in the industry NFVT trials and has fast establishment and regrowth from grazing making it an ideal 6-9 month option.

Hogan produces high DM yield and outyields 30+ year old Tama by over 1.2t DM/ha. The value of this extra cool season feed is $480/ha*, for an extra seed cost of $35-45/ha to sow Hogan.

A key part in breeding Hogan was rapid establishment to provide ‘fast feed’ in autumn, critical to dairy systems.

## TABU+

Tabu+ is a 12-18 month pasture option and is rated as 5-star ryegrass sitting in the ‘winter feed’ category of the DairyNZ FVI nationwide.

It was bred to supersede the best selling Tabu, with significantly higher DM yield. It is nutritious, with explosive establishment speed and superior cool season growth.

*$480/ha or 40c/kgDM vaule for establishment autumn-spring pasture in the DairyNZ FVI.

# BEST PRACTICE PASTURE NUTRITION

## NEW PASTURE

A healthy, high-producing pasture is an extremely valuable asset on both dairy and dry stock farms. Renewing old, run-out pastures (as outlined on page 5 – Pasture Condition Score) can deliver a significant economic benefit for farmers, provided that it is done carefully, so that the new pasture establishes well and goes on to deliver the anticipated production gains.

Ideally, the renewal programme will include an annual, winter active ryegrass followed by a summer crop, before the new permanent pasture is sown. This will help to control or eradicate pasture pests and weeds, creating a more favourable environment for the new pasture species. Sowing new pasture also provides an opportunity to select new cultivars of ryegrass and clover; contact your local Farm Source TSR for independent advice on the best cultivars for your farm.

## BEFORE SOWING

If new pasture is to establish and persist, then any problems need to be addressed before sowing. Potential issues include compaction, poor soil condition, low soil fertility, pasture pests and weeds. Physical conditions such as poor drainage also need attention, otherwise they will continue to cause problems in the future. Soil fertility deficits also need to be corrected, so that the new pasture species will establish and thrive. Failure to address soil fertility will increase the likelihood of low-fertility pasture species dominating the paddock.

**When to do a soil test:** At least 6 months before sowing; if possible, 12 months before sowing.

**Why:** Pasture prefers a pH between 5.8 and 6.0. If soil pH needs adjusting, lime needs to be applied – it will take at least 6 months to have an effect on soil pH. Soil testing early also allows sufficient time to correct the nutrient levels with a suitable base fertiliser.

**How:** Sample using a 75mm soil probe. Soil test a transect (line) across the paddock. Avoid areas that are not typical of the paddock, e.g. fence lines, stock camps and urine patches. Samples can be collected in either autumn or spring. Do not sample within 3 months of applying fertiliser or lime, or when soil is saturated.

## PRODUCTS

**Lime:** Choose a good quality ag-lime. As a rule of thumb it takes about 1 tonne of lime to raise the soil by +0.1pH.

**Base fertiliser:** The actual product needed and the rate to be applied will depend on soil test results. However, products in the Ballance SuperPlus range are generally suitable, as they supply most of the nutrients needed to support pasture growth. Alternatively, products in the Ballance PasturemagPlus range could be considered.

## AT SOWING

Use a starter fertiliser at, or immediately prior, to sowing

**Why:** Like all crops, grasses and clovers need an adequate supply of nutrients in order to grow well.

If these nutrients, particularly P and N, are placed close to the seed, then seedlings will establish strongly and rapidly. Good growth during the early part of the pasture's lifecycle plays a significant role in ensuring that it meets its potential. If the renewal programme has included a summer crop, then this will have removed nutrients from the soil, so including a starter fertiliser is even more important.

**How:** Drill with the seed (in a separate box). Make sure there is no direct contact with the seed.

Alternatively, broadcast fertiliser then incorporate into the soil just before sowing. If broadcasting, a higher application rate will be required.

## PRODUCTS

**Ballance DAP:** Often used as a starter fertiliser, as it supplies both N and P, two nutrients most critical to early plant growth. If P and N are the only nutrients required then DAP could be used at rates of around 150kg/ha.

**Ballance Cropzeal 16N:** If a broad spectrum of nutrients is required, consider Cropzeal 16N. This will supply K and S, along with P and N. It is a good option if soil Olsen P is above 15. Typical application rates for Cropzeal 16N are between 250-350kg/ha.

## POST EMERGENCE

**When to apply post-emergence Nitrogen:** The first application of nitrogen should go on following the first grazing, which is typically when the pasture is 5-6 weeks old. Subsequent applications of nitrogen should be made after each grazing.

**Why:** Light applications of nitrogen will help ryegrass produce more tillers, which helps with persistence. Nitrogen also helps to speed up leaf expansion, allowing plants to compete with weeds. New pasture particularly benefits from nitrogen applications during the first 18 months, as it takes this long for clover to become sufficiently established to fix appreciable amounts of atmospheric nitrogen.

**How:** Nitrogen applications need to be made on a regular basis for the first 12-18 months of the new pasture's life. They should be complemented by good grazing practices, to ensure the development and persistence of a strong sward. Nitrogen should be applied when plants are actively growing; applications should not be made if conditions are too cold or wet to support pasture growth. Rates of nitrogen used should be relatively light – in the order of 25-30kg N/ha.

## PRODUCTS

**Ballance SustaiN:** SustaiN is always recommended, unless you are expecting 10mm of rain within 8 hours of application. SustaiN is uniquely formulated to reduce the amount of N lost by volatilisation by 50%, which occurs without sufficient rainfall. This means that more N is retained in the soil, where it can be used by pasture. Apply this product to new pasture at a rate of 55-65kg/ha.

**Ballance Nrich Urea:** If 5-10 mm of rain is sure to fall within 8 hours of application, then Nrich Urea may be used. The rainfall is required to wash the urea into the soil, where it isless susceptible to the effects of volatilisation. Nrich Urea should be applied to new pasture at a rate of 55-65kg/ha.

# MAXIMISING NEW PASTURES FOR PERFORMANCE & PRODUCTION

**There are many ways to set up a new pasture, ranging from a planned, detailed Programmed Approach™, to an autumn 'Grass to Grass' scenario. Whichever your preferred method, too often a crucial last hurdle in the pasture renewal process is missed, that being a post emergence spray to control weeds.**

High weed populations can severely limit new pasture performance and its persistence. Some weeds can aggressively compete for space, nutrients and moisture and can hamper your end goal of a productive, persistent pasture to feed stock well.

New pasture herbicides programmes don't need to be overly complicated. They generally fit into one of three scenarios;

1

## PRE-SOW SPRAY OUT

Start strong with a clean seed bed. Remove all potential competition for your new pasture varieties.

2

## PRE-GRAZE SPRAY

First chance to remove weeds while they are small seedlings with a clover safe option.

3

## POST-GRAZE SPRAY

Last chance to remove weeds while they are small with a clover safe option.

# PRE-SOW SPRAY OUT

**In a spray-out situation, its important to make sure what you're spraying has enough leaf to achieve a strong kill.**

**CRUCIAL®** and **Pulse® Penetrant** form the foundation of most spray outs. In some situations a companion herbicide such as **Nail® 600EC** can improve the control of hard to kill broadleaf weeds. Where drift is of primary concern **Amigo®** can be used in place of Pulse to minimize off target drift.


## CRUCIAL®

**Product Type:** Advanced Technology Herbicide
**Active Ingredient:** 600g/L Glyphosate
**Formulation:** Soluble Concentrate

- Excellent Efficacy – execute with precision, even under challenging conditions.
- Outstanding Compatibility – tried and tested with the widest range of tank mix partners.
- Fast Knockdown, Quick Turnaround: 1 day for annual and 3 days for perennial weeds.
- Rainfast in 15 Minutes with Pulse Penetrant.
- Exceptional Viscosity – fast pouring in all climatic conditions.
- Anti-foam Technology.

## NAIL® 600EC

**Product Type:** Herbicide
**Active Ingredient:** 600g/L Carfentrazone-Ethyl
**Formulation:** Emulsifiable Concentrate

- Zero grazing withholding period.
- No plant back restrictions.
- Rapid absorption and fast brownout.
- Compatible with **CRUCIAL** and other knockdown herbicides.
- Rainfast in 1 hour.


## PULSE® PENETRANT

**Product Type:** Adjuvant

**Active Ingredient:** Organo-Silicone Penetrant

**Formulation:** Liquid

- Improves the adhesion, wetting and penetration of herbicides.
- Provides a 15 minute rainfast guarantee when used with **CRUCIAL.**
- Increases the amount of herbicide entering the plant.


## AMIGO®

**Product Type:** Adjuvant

**Active Ingredient:** Phosphatidylcholine, methyl esters of fatty acids and alcohol ethoxylate

- Reduces driftable fines.
- Provides more uniform droplet size.
- Increases droplet retention.
- Excellent anti-foam system.

# PRE-GRAZE SPRAY

**In a pre-graze spray situation, it's important that weeds are addressed early, while they are SMALL seedlings with a product(s) that is safe over small establishing clovers.**

This is often with products such as **Tribal® Gold**, **Thistrol® Plus** and/or **Valdo® 800WG**, with **Bonza Gold®** oil once clover seedlings have at least two 'true' (trifoliate) leaves and pastures have at least 70% ground cover.


## TRIBAL® GOLD

**Product Type:** Herbicide
**Active Ingredient:** 300g/L MCPB, 20g/L MCPA and 10g/L Flumetsulam
**Formulation:** Soluble Concentrate

- Controls of a wide spectrum of broadleaf weeds.
- Clover and grass friendly – allows early weed control.
- Convenient all in one pre-mix, liquid formulation that is easy to measure and use.
- 2 hour rainfast period.
- Always add **Bonza Gold.**


## THISTROL® PLUS

**Product Type:** Herbicide
**Active Ingredient:** 375g/L MCPB and 25g/L MCPA
**Formulation:** Soluble Concentrate

- Combines MCPA and MCPB giving flexibility to use over a wide range of situations.
- Controls seedling broadleaf weeds in young and established pasture.
- Suitable to use prior to your first graze in new pasture.
- Excellent clover safety.


## VALDO® 800WG

**Product Type:** Herbicide
**Active Ingredient:** 800g/kg Flumetsulam
**Formulation:** Water Dispersible Granule

- Increases weed spectrum – certain weeds which are poorly controlled by phenoxy herbicides.
- Suitable for use with **Thistrol Plus** or **Baton 800WSG.**
- Highly cost-effective weed control.
- Always add Bonza Gold.
- Many tank-mixing options for optimal weed control.


## BONZA GOLD®

**Product Type:** Adjuvant
**Active Ingredient:** 450g/L Canola oil
**Formulation:** Plant Based Oil

- Improves deposition, wetting, spreading and plant uptake.
- Aids in the management of spray droplet quality and survival.
- Potential to increase droplet VMD and reduce fine droplets.
- Tried, Tested, Proven in a range of NZ conditions.

# POST-GRAZE SPRAY

**In a post-graze situation, where weeds have germinated later and are generally larger.**

A combination of **Baton® 800WSG**, **Valdo® 800WG** and **Bonza Gold®** oil provides good results. In these post grazed situations numerous regional trials in New Zealand have demonstrated the clover safety of **Baton® 800WSG** and the resultant increase in pasture and clover yields.


## BATON® 800WSG

**Product Type:** Herbicide
**Active Ingredient:** 800g/kg 2,4-D
**Formulation:** Water Soluble Granule

- Non-volatile and low odour 2,4-D amine.
- Controls broadleaf weeds in new pasture.
- Improved clover safety.
- Ideal for boom and aerial spraying.
- 6 hour rainfast period.


## VALDO® 800WG

**Product Type:** Herbicide
**Active Ingredient:** 800g/kg Flumetsulam
**Formulation:** Water Dispersible Granule

- Increases weed spectrum – certain weeds which are poorly controlled by phenoxy herbicides.
- Suitable for use with **Thistrol Plus** or **Baton 800WSG.**
- Highly cost-effective weed control.
- Always add Bonza Gold.
- Many tank-mixing options for optimal weed control.


## BONZA GOLD®

**Product Type:** Adjuvant
**Active Ingredient:** 450g/L Canola oil
**Formulation:** Plant Based Oil

- Improves deposition, wetting, spreading and plant uptake.
- Aids in the management of spray droplet quality and survival.
- Potential to increase droplet VMD and reduce fine droplets.
- Tried, Tested, Proven in a range of NZ conditions.

# UNDERSOWN PASTURES EXISTING PASTURES

**If you have open pastures and you're investing in under-sowing and new ryegrass seed, you'll want to give these areas every chance to establish and produce to their full potential.**

After periods of pasture stress, such as wet winters – with pasture pugging, or droughts - with periodic overgrazing, pastures can open up and require some undersowing to perform at their best.

When investing in this process, it can be important to control weeds during establishment to:

- Maximize ryegrass populations
- Reduce weed burden in open pastures
- Maximize pasture production and utilization

Whether your preferred programme includes Italians for winter/spring production, or hybrid/perennial ryegrasses with endophyte for longer term persistence, a pre-graze spray, four to six weeks after drilling, or a post graze spray, 7–10 days after grazing can make all the difference.

With the timing of autumn drilling varying across the country, the best timing for these applications can be during April or May but needs to be prior to soil temperatures dropping below 10°C for some herbicides.

Herbicide options depend on your situation, but include well-known brands such as **Baton® 800WSG , Sprinter® 700DS, Valdo® 800WSG and Bonza Gold®**. As these undersown situations do not generally include new clovers, these products offer the best for both timing and weed control.

# KEY PRODUCT USE RATE

| NEW PASTURE \| SPRAY OUT | |
|---|---|
| **PRODUCT** | **TYPICAL USE RATES** |
| CRUCIAL | 2.4-5.4L/ha |
| Nail 600EC | 20-40ml/ha |
| Pulse Penetrant | 100ml/100L water |
| Amigo | 125-200ml/100L water |

| NEW PASTURE \| PRE-GRAZE | |
|---|---|
| **PRODUCT** | **TYPICAL USE RATES** |
| Tribal Gold | 4-5L/ha |
| Thistol Plus | 3-4L/ha |
| Valdo 800WG | 65g/ha |
| Dictate | 3L/ha |
| Bonza Gold | 500ml/100L water |

| NEW PASTURE \| POST-GRAZE | |
|---|---|
| **PRODUCT** | **TYPICAL USE RATES** |
| Baton 800WSG | 1-1.5/ha |
| Valdo 800WG | 65g/ha |
| Bonza Gold | 500ml/100L water |

| UNDERSOWN PASTURE \| POST-SOWING | |
|---|---|
| **PRODUCT** | **TYPICAL USE RATES** |
| Baton 800WSG | 2-2.5kg/ha |
| Valdo 800WG | 65g/ha |
| Bonza Gold | 500ml/100L water |

Talk to your local TSR or AgChem Representative for the spray mix that is right for you, your weed mix and timing.

**CONDITIONS:** Cultivars in pack may differ to those listed due to availability at time of mixing. The sale of these goods is made strictly on the basis that Fonterra Farm Source, RD1 Limited and the vendor of the goods disclaim all liability, whether express or implied and whether in contract, tort or otherwise, for any loss, damage, claim or injury arising from the result produced by the goods or any failure of the goods to produce a desired result where such result or failure is attributable to any act or omission of the purchaser or any factor beyond the control of Fonterra Farm Source, RD1 Limited or the vendor, including without limitation, purchaser negligence, the storing and sowing of the seed, time of sowing, cultivation, soil conditions, weather conditions, third party intervention and all acts of God. If Fonterra Farm Source, RD1 Limited or the vendor of the goods is found to have any form of liability for any breach of any obligations imposed on them by law, then the purchaser agrees that liability is limited to replacement of such goods or damages not exceeding the original retail price of the goods. Fonterra Farm Source, RD1 Limited and the vendor shall not be liable for any consequential, indirect or special damages or loss of any kind whatsoever including without limitation loss of profits, whether arising from the goods, the result produced or intended to be produced, or from any other cause whatsoever. For specific advice in relation to your farm needs, please consult your local Fonterra Farm Source Technical Sales Rep.

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