PGG Wrightson Seeds

Pasture & Brassica Guide

2025/26

Contents

Introduction

Welcome to the new look PGG Wrightson Seeds Pasture and Brassica guide. This guide is more than a catalogue of our products – it is a practical tool. Inside, you will find information on pasture and crop selection, sowing techniques, grazing management and a PGG Wrightson Seeds Programmed Approach® strategy to complement your overall farm plan.

At PGG Wrightson Seeds we appreciate that there are numerous options available for forage. We aim to help remove some of the confusion and make your decision easier.

With over 160 years of experience in seed development and agronomic support, PGG Wrightson Seeds is proud to be a trusted partner in New Zealand agriculture. Our business is committed to supporting farmers with the tools, knowledge and seed technologies that help drive success. We spend over $18 million dollars per annum on our forage and endophyte programmes, partnering with key companies like AgResearch and Plant and Food Research. Each variety in this guide has been trialled, tested and selected for traits that matter – yield, persistence, disease resistance and animal performance.

We have a passionate and knowledgeable team with decades of combined experience in the industry to help you with tailored advice for your farming operation.
We are here to help – call your local Sales Agronomist or visit us at pggwrightsonseeds.com

Scan to learn more about us

FOLLOW PGG WRIGHTSON SEEDS ONLINE!

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- pggwrightsonseeds
- linkedin.com/company/pgg-wrightson-seeds

THE RUMEN ROOM

Join Charlotte's interactive Facebook group "**The Rumen Room**", where she regularly posts on topics relevant to animal nutrition, farm systems and veterinary science. Charlotte and group members engage in open discussion, share information and gain advice.

CHARLOTTE WESTWOOD, VETERINARY NUTRITIONIST, MEASURING PASTURE COVER.

PGG Wrightson Seeds

Programmed Approach®

Re-energise your pasture

The PGG Wrightson Seeds Programmed Approach® enhances farm productivity by focusing on growing **high-quality, home-grown** feed to meet livestock demands. It focuses on using pastures and forage crops to improve farm performance and profitability, increasing both dry matter (DM) yield and feed quality.

We represent the amount of energy available to an animal from different feeds as metabolisable energy (MJME/kgDM). Our aim is to grow more home-grown metabolisable energy to increase productivity through higher stocking rates and improved individual animal production (meat, milk, wool).

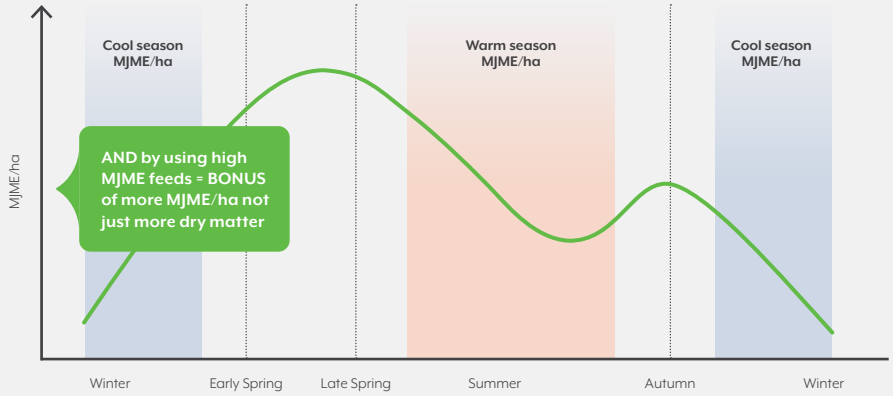
WHY FOCUS ON HIGH-QUALITY HOME-GROWN FEED?

1	2	3	4	5
Cost-effective feed	**Feed conversion efficiency (FCE)**	**Forage ultilisation**	**Resilience & animal health**	**Environmental benefits**
Lower cost per kg DM and per MJME/kg DM eaten.	More animal product per kg DM consumed.	Animals consume more high-quality feed, improving grazing ease and dry matter intake.	Better nutrition and forage alternatives reduce health issues (e.g. internal parasites).	Fewer purchased feeds, lower CO_2 emissions, and reduced emissions intensity (e.g. Fonterra Scope 3 emissions).

FILLING THE GAPS IN THE FEED CURVE

A typical pasture growth curve for perennial ryegrass and white clover shows a seasonal feed shortage. By understanding livestock production needs, we can identify where increased feed demand occurs, particularly during cooler (Cool Season) and warmer (Warm Season) months. The PGG Wrightson Seeds Programmed Approach® focuses on strategically growing high-energy, home-grown feed when it's needed most, utilising various pasture and forage crops to meet these gaps.

Pasture growth curve of ryegrass/white clover pasture, with opportunities to grow more home-grown & high-quality feed.



CSA COOL SEASON ACTIVE WSA WARM SEASON ACTIVE

WARM SEASON VS COOL SEASON CULTIVARS

To understand the value of different pasture and crop options and how they fit into the PGG Wrightson Seeds Programmed Approach®, we have categorised our cultivars as 'Cool Season Active' and/or 'Warm Season Active', demonstrating their value to add more feed to the typical feed curve relative to traditional perennial ryegrass/white clover pastures.

Seasonal Growth within Cool and Warm Season

To understand seasonal growth within a 'Cool Season' and 'Warm Season', it's useful to differentiate species and cultivars as either **Feed banking** (species that can be grown prior to the feed deficit and stored to fill the feed gap) or **Growing** (species that have the ability to grow through the feed deficit). Some species have the ability to also do both. It is these strengths that can be capitalised on to use within the PGG Wrightson Seeds Programmed Approach®.

For the full range of Cool and Warm Season Active cultivars, contact your local PGG Wrightson Seeds Sales Agronomist.

Cool season active:

Warm season active:

RECOGNISING SUMMER QUALITY

An essential component of Warm Season Active (WSA) cultivars and the broader PGG Wrightson Seeds Programmed Approach® is not only having feed available in summer, but ensuring that feed quality meets animal performance goals. Cultivars with proven summer quality characteristics are endorsed by our Summer Quality (SQ™) trademark, as high-quality feed is crucial for optimal animal health and performance during the warmer months.

Recent animal trials using Sika chicory, Rocket Fuel® and Pallaton Raphno® brassica with both young cattle and lambs illustrated the impact forage crops with the SQ™ characteristics have – an example of what can be achieved through cultivar selection to fit the feed system.

LATE-HEADING RYEGRASSES FOR IMPROVED ANIMAL PRODUCTION

Perennial and hybrid ryegrasses that are very late (+22 to +35 days) or extremely late (+36 days) to flower can offer significant benefits for animal production and performance on farms. If improved summer performance for both yield and quality are required in the development of your PGG Wrightson Seeds Programmed Approach® then consider these cultivars as the basis of your pasture mix.

Benefits of Supalate™ Ryegrasses

The late-heading nature of these ryegrasses offers several advantages:

- **Shift in the feed curve:** Increased feed availability in late spring.
- **High rust tolerance:** These cultivars are less susceptible to rust, improving feed palatability.
- **Compressed seeding period and reduced aftermath seeding:** These ryegrasses stay vegetative for most of the growing season, leading to improved pasture quality and a reduced need for reseeding.

Consider these cultivars for your PGG Wrightson Seeds Programmed Approach®

If you're looking to improve summer performance, these late-heading ryegrass cultivars would be a valuable addition to the development of your PGG Wrightson Seeds Programmed Approach®.

Identifying Late-Heading Ryegrass Cultivars with the Supalate™ Characteristics

The following three late-heading ryegrass cultivars qualify to carry the Supalate™ logo:

Palliser TETRAPLOID LONG ROTATION RYEGRASS	(+25 days)
Vast TETRAPLOID PERENNIAL RYEGRASS	(+36 days)
Accrue DIPLOID PERENNIAL RYEGRASS	(+22 days)

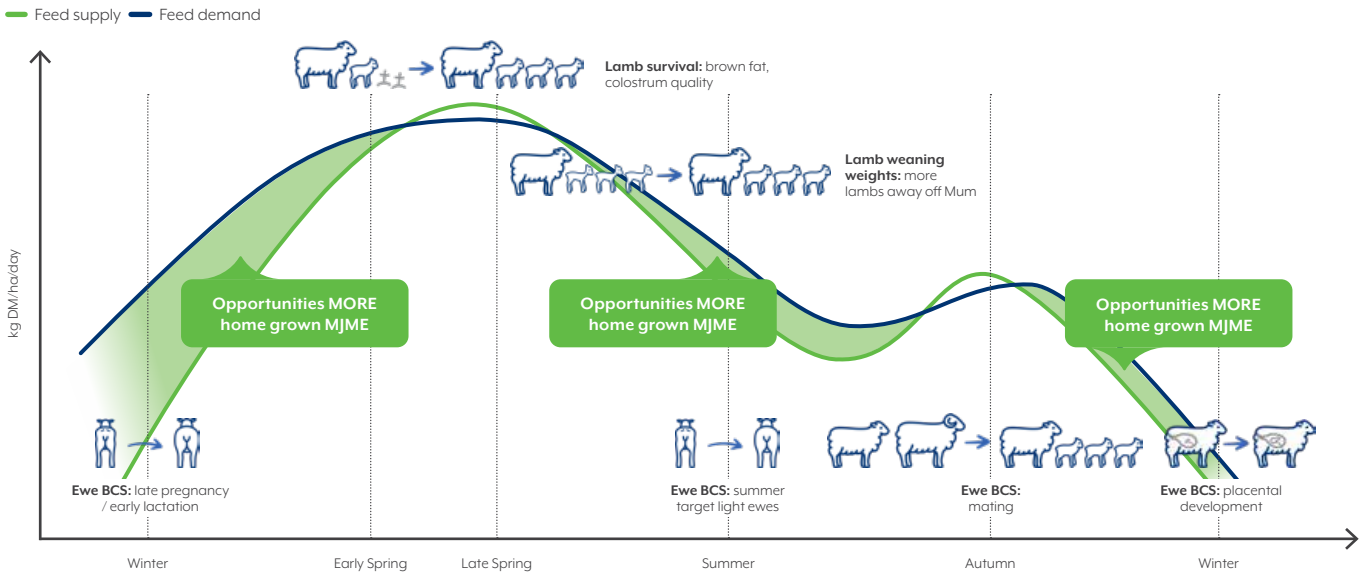
PGG Wrightson Seeds

Programmed Approach® in a sheep system

In a sheep system there are key opportunities to boost productivity by increasing cool season and warm season growth to meet additional feed demands including:

- **Ewe body condition** – Optimal condition year-round, especially during late pregnancy, early lactation, and mating.
- **Improved lamb survival** – Better brown fat deposition and colostrum quality.
- **Higher lamb weaning weights** – Resulting in heavier lambs weaned off the ewe.
- **Body condition score of at least three at mating** – Improved mating performance.
- **Post-mating to lambing** – Maintaining ewe condition for placental and post-lambing growth.

Seasonal Sheep System Feed Supply Curve



Example only: Influenced by multiple pasture-based factors, season to season variation and stocking rate decisions.

DESIGNING A PROGRAMME

Every programme will be unique to each individual farm. It's all encompassing, with a lot of factors to consider, but, it doesn't have to be overly complex. For example, a hill country sheep and beef farm, with an opportunity to do some forage cropping (including a need for winter and summer forage), whilst strategically targeting the opportunities in the sheep farm identified previously could look like this using the PGG Wrightson Seeds Programmed Approach®:

This rotation has a number of agronomic advantages too:

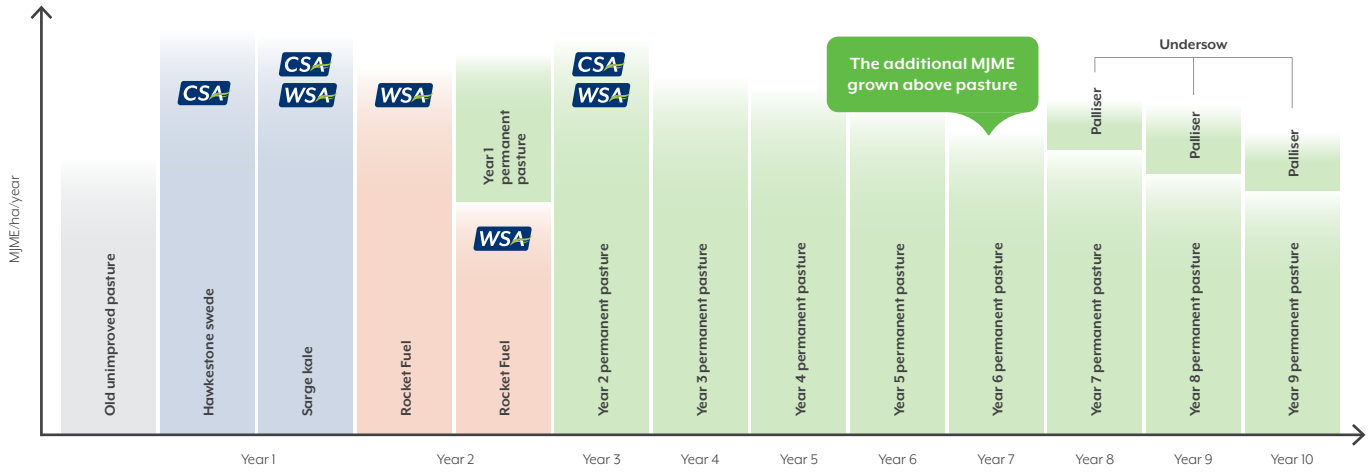
- Incorporate the latest products and technologies into your farm system to help unlock its full potential
- A repeatable, sustainable, crop rotation over numerous years
- Gives continuity for sowing and grazing/harvesting of home-grown feed
- Breaks disease cycles for pasture and crop diseases
- Allows use of low-tillage systems
- Opportunity to break pest cycles related to pasture
- Target weed control programme utilising an integrated weed management programme (IWM)

ENERGY GROWN

On a timeline, we can see the additional energy produced per hectare throughout the rotation relative to old unimproved pasture. This shows the opportunities to improve on farm productivity of not only the ewe but offer opportunities to improve other stock classes such as cattle and young stock.

- **Year 1:** Cleancrop™ Hawkestone swede – carry high capital stock numbers in winter.
- **Year 2:** Cleancrop™ Sarge kale – like the swede can carry capital stock numbers in winter, but also offers opportunities to be used as autumn feed for improving body condition score and/or young stock performance.
- **Year 3:** Rocket fuel™ is a chicory/clover crop to improve stock performance in summer and mitigate risk of animal health issues such as internal parasites. In year two, it can act as a high-quality feed for ewes with multiple lambs.
- **Year 4:** Paddocks sown with the highest quality pasture mix, with agronomic attributes that best suit the individual farm.

Annual production of metabolisable energy per hectare on a sheep breeding farm using the PGG Wrightson Seeds Programmed Approach®



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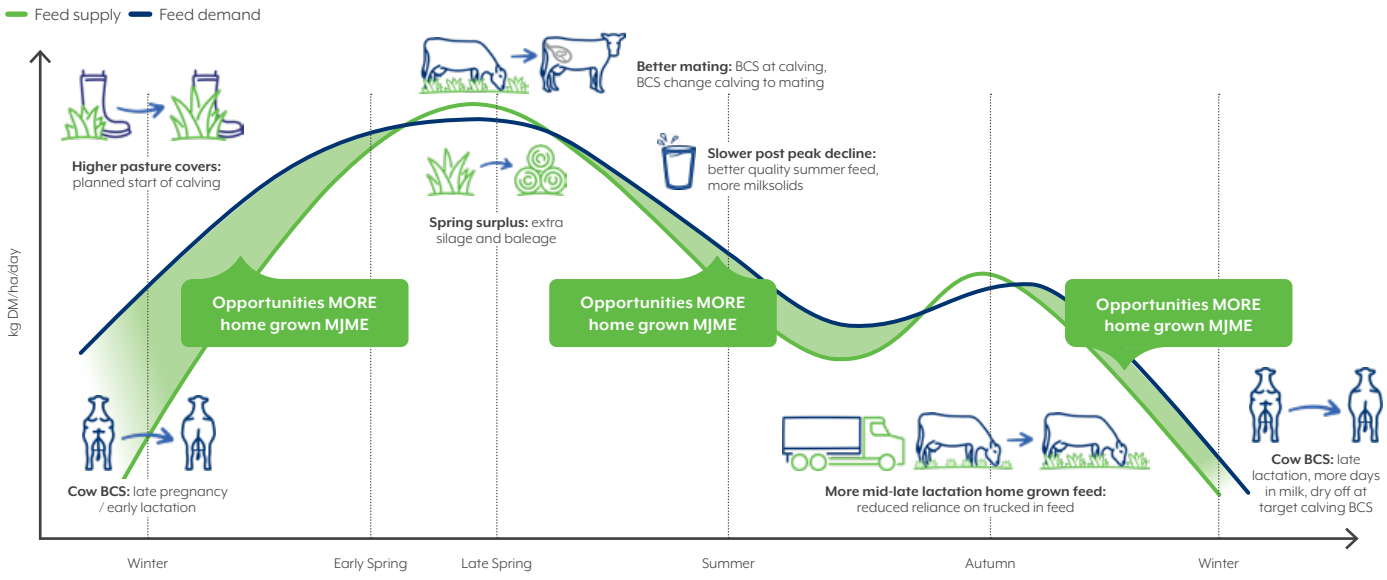
Programmed Approach® in a seasonal supply dairy system

In a spring calving dairy system key opportunities to boost productivity include increasing cool and warm season growth, relative to a typical pasture growth curve, to meet additional feed demands including:

- Improved body condition score in late pregnancy/early lactation.
- Higher pasture covers at calving start and faster growth post-grazing.
- Increased spring surplus for silage and baleage.
- Better body condition during the calving-to-mating period.
- Slower post-peak decline.
- Enhanced feed quantity and quality in summer/autumn.
- Maintaining body condition in late lactation, increasing days in milk and supporting calving condition scores.

Seasonal Dairy System Feed Supply Curve



Example only: Influenced by multiple pasture-based factors, season to season variation and stocking rate decisions.

DESIGNING A PROGRAMME

Every programme will be unique to each individual farm. It's all encompassing, with a lot of factors to consider, but it doesn't have to be overly complex. For example, a dairy system using summer crops to support milk production in the summer/autumn, with the ability to grow maize and a policy of renewing pasture at 10% per year, could look like this when using the PGG Wrightson Seeds Programmed Approach®.

This rotation has a number of agronomic advantages too:

- Incorporate the latest products and technologies into your farm system to help unlock its full potential
- A repeatable, sustainable, crop rotation over numerous years
- Gives continuity for sowing and grazing/harvesting of home-grown feed
- Breaks disease cycles for pasture and crop diseases
- Allows use of low-tillage systems
- Opportunity to break pest cycles related to pasture
- Targeted weed control programme utilising an integrated weed management programme (IWM)

ENERGY GROWN

On a timeline, we can see the additional energy produced per hectare throughout the rotation relative to old unimproved pasture.

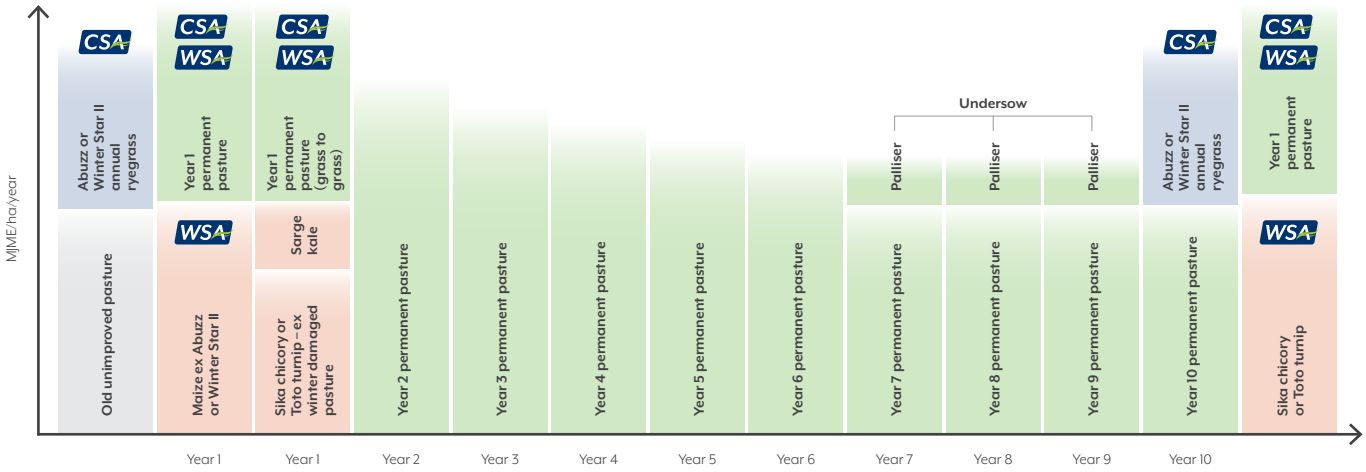
First 5% of milking platform:

- **Autumn:** Select 5% of milking platform for renewal, sow Abuzz or Winter Star II annual ryegrass and use through to early spring for conserved and milking feed.
- **Spring:** Sow the Abuzz or Winter Star II area in maize for silage.

Second 5% of milking platform:

- Identify paddocks that have been damaged over winter and early spring.
- Sow either summer turnips such as Cleancrop™ Toto or Sika chicory to supplement cow intakes at approximately ⅓ of their diet over the summer/early autumn period. The higher protein content of these feeds complements the remaining ⅔ of the diet from pasture and/or maize silage.
- Once the maize is harvested and summer crops are fed off, new pasture is sown (10% of the milking platform) with the pasture mix based on the feed needs identified above. This rate of pasture renewal means pastures need to last for at least 9 years, so undersowing may need to be used to maintain pasture growth over this duration.

Annual production of metabolisable energy per hectare on a seasonal supply dairy farms using the PGG Wrightson Seeds Programmed Approach®



Dairy platform a year = 5% chicory and/or brassica and 5% maize per year equals a 10% pasture renewal rate.

Science, seeds and solutions

CHECK OUT THESE NEW PRODUCTS!

GRASSLANDS® **Sika** CHICORY

NEW

See page 49 or scan to learn more about Sika

Abuzz TETRAPLOID ANNUAL RYEGRASS *ex harvest

NEW

See page 39 or scan to learn more about Abuzz

Palliser TETRAPLOID LONG ROTATION RYEGRASS

NEW

See page 34 or scan to learn more about Palliser

Midway DIPLOID PERENNIAL RYEGRASS

NEW

See page 28 or scan to learn more about Midway

Accrue DIPLOID PERENNIAL RYEGRASS

NEW

See page 29 or scan to learn more about Accrue

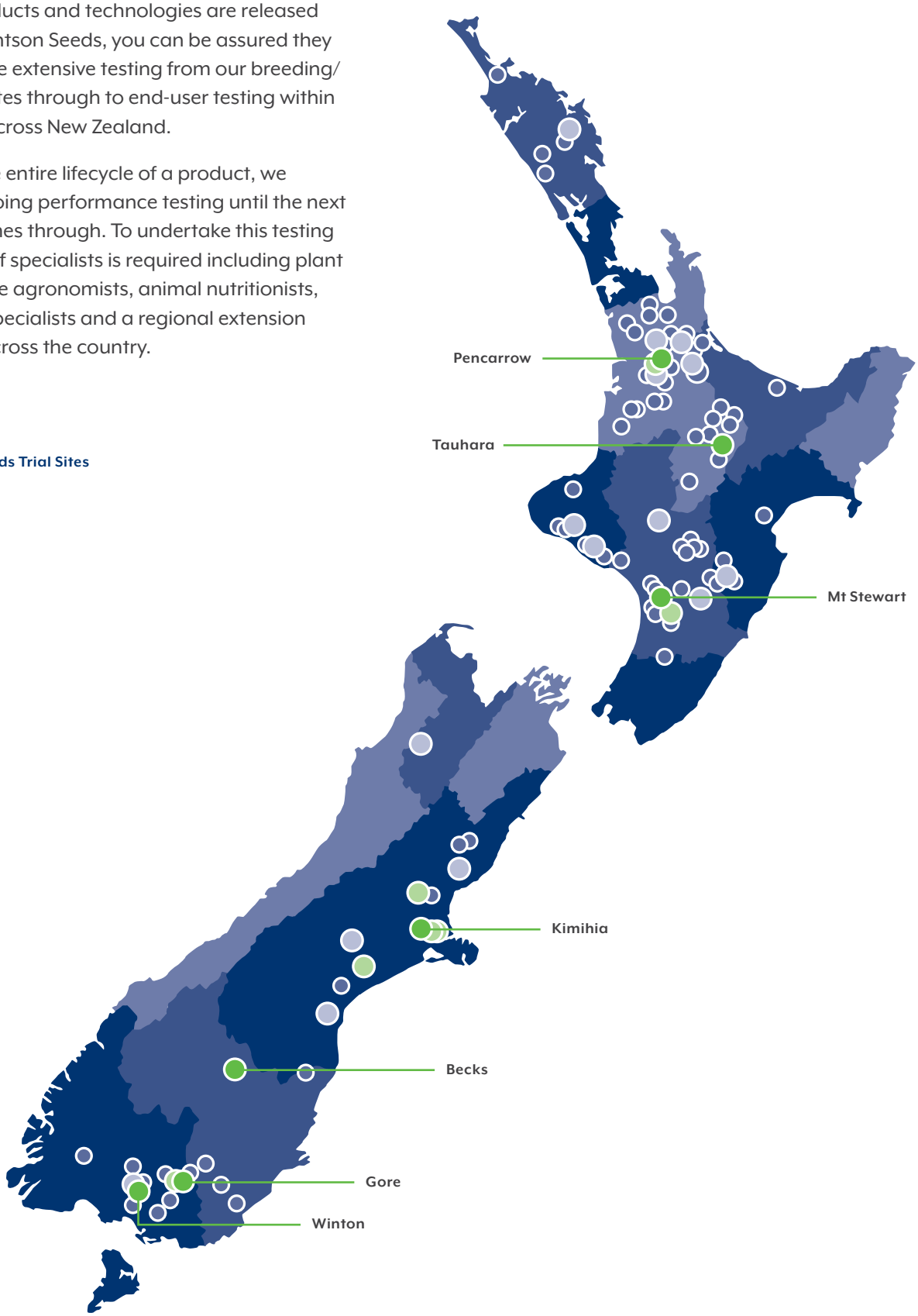
Connecting to the end-user

When new products and technologies are released from PGG Wrightson Seeds, you can be assured they have undergone extensive testing from our breeding/ development sites through to end-user testing within farm systems across New Zealand.

Throughout the entire lifecycle of a product, we undertake ongoing performance testing until the next generation comes through. To undertake this testing a skilled team of specialists is required including plant breeders, forage agronomists, animal nutritionists, farm systems specialists and a regional extension team spread across the country.

PGG Wrightson Seeds Trial Sites

- Seeds in Action®
- R&D Sites
- Stage 3
- On-Farm Demo Trials



SEEDS IN ACTION®

Seeds in Action® sites are a unique combination of regional research as well as hands-on practical demonstration sites. Undertaken by our team of regional agronomists, Seeds in Action sites are spread across the livestock farming regions of New Zealand. Our aim is to provide local insight to our products and technologies through quantifying regional performance, testing of new concepts and management practices and on-farm system fit. Field days and training events are regularly held at these sites.

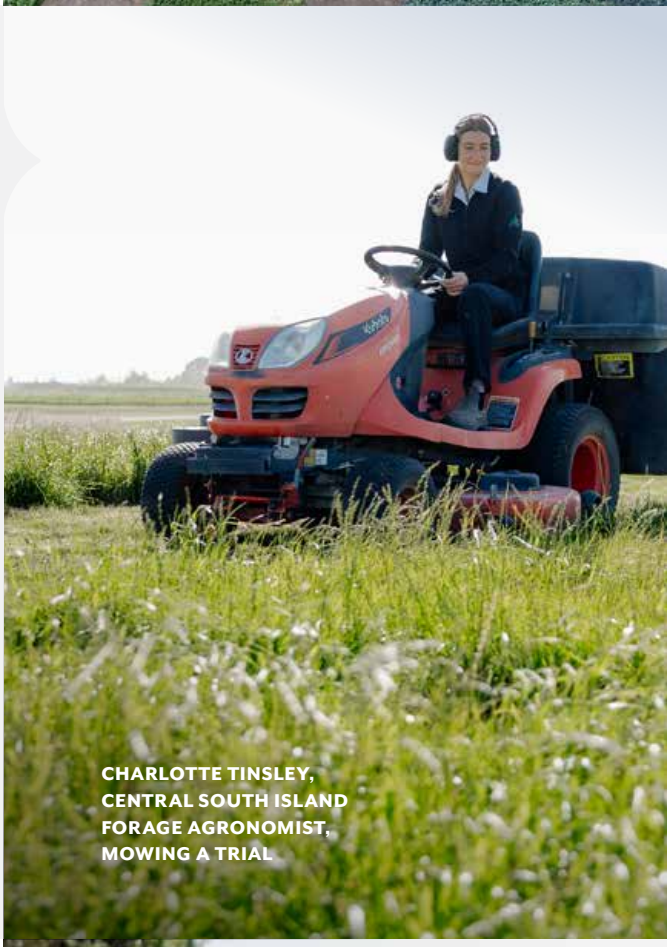
If you are interested in discovering what may be occurring in your region, contact one of our team members from the list at the end of the book.

MEMBER OF NZPBRA (NEW ZEALAND PLANT BREEDING AND RESEARCH ASSOCIATION)

PGG Wrightson Seeds were a founding member of the NZPBRA when first established in 1991. Representing plant breeders, intellectual property owners, and managers of proprietary agricultural seed companies, the PBRA's key focus is the development and marketing of plant intellectual property based on the strength of research-proven performance standards.

The National Forage Variety Trial (NFVT) system allows us to benchmark the performance of our new grass cultivars and associated endophyte in regional, replicated plot trials, which measure dry matter yield and other performance factors across New Zealand. The trials are run to a strict protocol to ensure uniformity across sites, and results are reviewed and validated by the appropriate committee members.

Each year, seasonal and annual dry matter yield summaries are developed and posted on a regional and national basis, which are available on their website http://pbra.co.nz/trial-data/forage-grasses



CHARLOTTE TINSLEY, CENTRAL SOUTH ISLAND FORAGE AGRONOMIST, MOWING A TRIAL

ON-FARM TESTING

Ultimately, the endpoint of all our forage products is in the livestock farming systems of New Zealand. From small plot trials to paddock scale demos, our team of agronomists run a continuous programme of evaluation and testing on-farms throughout New Zealand.

These are a great opportunity to give exposure of products and technologies at a regional level and as a final step in proving their value on-farm. These trials and demos also offer an opportunity to gain valued feedback from users on how they see our products fitting on-farm, as well as providing guidance regarding the development of our next generation products.

WAYNE NICHOL, NATIONAL TECHNICAL MANAGER, IN CANTERBURY

The value of summer forage crops

IT'S NOT ONLY ABOUT GROSS MARGIN

When asked why we should grow a particular crop, we'll often hear a wide range of responses—from "we've always done it" to more sophisticated, farm system-level reasoning. Traditionally, crop performance is evaluated using financial metrics such as gross profit and gross margin.

These are calculated by determining total revenue per hectare, based on the margin per animal and stocking rate, then subtracting total costs, including crop establishment and subsequent pasture renewal. Gross margin as a percentage of revenue is often used to compare the economic efficiency of different crops. While these calculations are useful, they rarely account for the broader on-farm benefits that crops can bring.

Forage crops play an important role in farm systems by delivering feed when pasture growth is limited during winter in colder climates, and summer in more drought-prone regions. High yielding crops grazed *in situ* can help maintain stocking rates and per-head performance when otherwise performance may be compromised.

INTEGRATING FORAGE CROPS INTO PASTURE RENEWAL

Crops also serve as effective tools in pasture renewal programmes, acting as a break between poor quality, weed-infested paddocks and new, high-performing pastures. The use of crops allows us to manage persistent species such as couch (twitch) grass, docks and Californian thistles, especially when multiple spray-outs are used. Brassica monocultures offer particular advantages, with a range of herbicides available for effective weed and grass control.

Diverse (multi-species) crop mixes and species such as plantain or chicory can pose challenges for weed management, as herbicide options are often limited or unregistered.

To make the most of forage crops, it's essential to understand why the performance by a pasture in a proposed crop paddock has declined and what role a crop can play in the overall system including but not limited to the bulk of high quality feed provided by the crop itself. Integration into existing crop and pasture rotations, alignment with soil fertility and pest management goals, and well-planned grazing management all contribute to the success of a forage crop-based renewal programme. Limiting inputs such as fertiliser, herbicides and/or insecticides may be tempting during tight financial times but can compromise forage crop productivity, and negatively impact performance of new pasture planted after the forage crop.

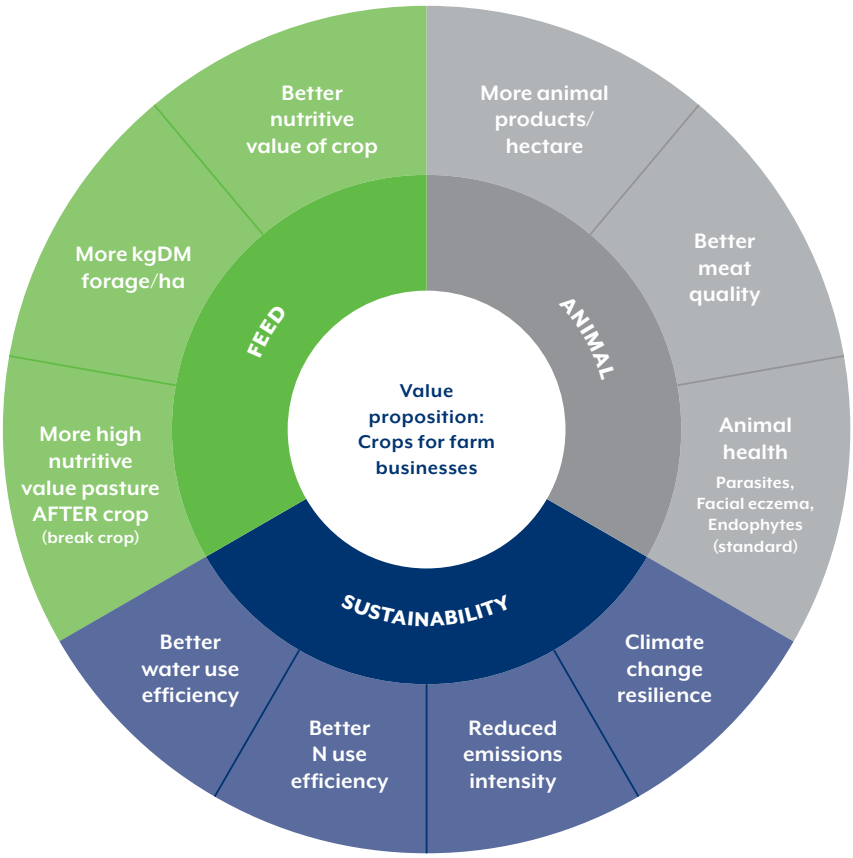
SUSTAINABILITY AND RESILIENCE

The role of forage crops in improving environmental sustainability is also receiving increasing attention. In a changing climate, with more frequent and prolonged droughts, crops provide more reliable feed at critical times. Pallaton Raphno®, a hybrid of kale and radish, offers both water and nitrogen use efficiency advantages. These traits support the sustainability credentials of forage-based systems, which may become increasingly important under future regulatory frameworks.

ANIMAL PRODUCTION

From an animal productivity perspective, forage crops typically have higher nutritive value than summer pasture, with more metabolisable energy (MJME) and crude protein (CP) per kilogram of dry matter (DM). This can translate into improved feed conversion efficiency and faster liveweight gain. When used to finish lambs, high-quality forage crops result in heavier carcasses with higher dressing percentages compared to pasture-fed lambs. Research by Holly Phillips from PGG Wrightson Seeds shows that crop-finished lambs also produce meat with improved eating quality, including improved tenderness, colour, and water-holding capacity. Interestingly, there appears to be little difference in meat quality between lambs finished on different high-nutritive value crops, suggesting that the key driver is overall feed quality rather than the specific crop type grazed by lambs.

Forage crops may also play a role in helping to manage internal parasites in young stock. Anthelmintic (drench) resistance in sheep and cattle internal parasites (worms) is an escalating issue across New Zealand. First-year and potentially multi-year forage crops offer one strategy to reduce reliance on frequent drenching.



High-quality feed promotes better CP supply, faster lamb liveweight gains, and improved immune function, enabling lambs to reach slaughter weights more quickly and with fewer drenches from weaning to finishing. In addition, some crops create physical environments that are less favourable for worm survival and transmission. Upright crop structures may reduce the likelihood of infective L3 worm larvae reaching the grazing horizon, while open canopies may create microclimates less conducive to larval development and survival.

LATEST TRIAL RESULTS

A recent trial by PGG Wrightson Seeds and PGG Wrightson Ltd demonstrated that lambs grazing first-year crops such as Raphno® brassica, Sika chicory with Quartz and Amigain clovers, or Ecotain® with Quartz and Amigain clovers had lower worm faecal egg counts (FEC) and higher growth rates compared to those grazing second-year chicory or ryegrass and clover-based pasture.

All lambs were drenched at the beginning of the trial, then monitored weekly for 70 days. Faecal egg counts remained lower for lambs on first-year crops, suggesting the potential for longer intervals between drenches for crop-fed lambs. However, worm burdens still need to be monitored with regular FEC, and further research is needed to define the interactions between crop type, grazing management and lamb resilience.

In conclusion, forage crops offer benefits that extend well beyond their role in filling feed deficits or delivering a solid gross margin. Their contributions to pasture renewal, sustainability, animal health, internal parasite control, and meat quality are increasingly important in modern farm systems.

Talk with your local PGG Wrightson Seeds expert or contact us if you'd like more information about how forage crops can benefit a farm business.

Reproduced in part from "Forage crops – it's not only about gross margin (2025) Westwood C and Leslie J. Conference proceedings of the Sheep and Beef Veterinarians and the Deer Veterinarians Branch of the NZVA.

Sustainability

Sustainability is no longer a choice in agriculture, it's a necessity. With growing global demand for food, increasing climate variability and the need to preserve our natural resources, the agricultural industry must continuously evolve to produce more with less.

Sustainable farming practices aim to balance productivity, environmental stewardship and social responsibility, ensuring that future generations can continue to farm and thrive. PGG Wrightson Seeds aims to be at the forefront of this evolution.

OUR COMMITMENTS:

- Being a leader in pasture and forage innovation, supporting sustainable agriculture through science-backed seed technologies, environmental best practices, supply chain efficiencies and farmer focused solutions.
- Investment in long-term plant breeding programmes and technologies that focus on traits such as drought tolerance, pest and disease tolerance, and pasture persistence. These traits help farmers maintain production in challenging conditions while reducing reliance on synthetic inputs.
- A fully integrated end-to-end supply chain. Starting with our arable farmers who grow seed under contract with us. On harvest, these crops are delivered to processing sites, including our own, where the seed can be dried, cleaned and stored. The seed can be sold into the market or further processed into products suitable for end users. Processing may include coating the seed with chemical or biological treatments to provide additional nutrients or insect protection, aiding the initial establishment of crops. The final step is the packing and delivery of seed, with a focus on the materials used, recyclability, and optimising our transport options to reduce our emissions profile.
- Education and knowledge transfer are another key focus. Our team provides technical advice, best practice guidelines, and on-farm support to help our customers make informed decisions that enhance productivity while caring for the land. Ultimately, sustainability is a shared responsibility, but we are proud to stand alongside New Zealand farmers and the industry to play our part in this.

Supporting the community

PGG Wrightson Seeds actively supports local communities through sponsorship of events, sports teams and rural initiatives.

From A&P shows to local field days to crop weighing competitions to school fundraisers and golf days, we believe by backing grassroot activities and celebrating rural life, we help strengthen community spirit and social connections. Our team is actively involved in these initiatives, with most living within these communities as well.

Along with community events, PGG Wrightson Seeds is also heavily involved with industry groups like Beef and Lamb and Meet the Need, or demonstration farms like Owl Farm in the Waikato. Connections here are important as it fosters collaboration, innovation and knowledge sharing across the agricultural sector, making things better for both our customers and farmers.

Pasture Options

POWER UP YOUR PASTURES

The following section will give some information on PGG Wrightson Seeds comprehensive proprietary pasture portfolio and their potential to fit in your farm system. Within this pasture options section, you will find:

The pasture renewal value proposition

The amount of pasture renewal that occurs on farms varies widely in New Zealand, with ranges of 0 – 20% per annum. How much renewal that needs to occur depends on multiple factors, but an important consideration is the rate of deterioration within paddocks.

There will be a point where a pasture declines so much that economically, renewal through a cropping rotation or pasture to pasture will be sufficiently justified. A key part of establishing a pasture's economic value is to include, in a pasture management programme, measures of pasture productivity, botanical composition over time and animal performance. If the average pasture on farm is economically viable for 10 years, then the replacement rate is 10% of the farm per year.

WHY SHOULD YOU RENEW PASTURE?

Pastures deteriorate over time due to natural and induced causes, for example:	• Weed invasion from broadleaf weeds and non-sown grasses • Dry, drought conditions • Wet, water-logged soils, poor drainage	• Pugging and soil compaction • Pasture pests, e.g. grass grub and black beetle • Plant diseases, e.g. rust • Overgrazing and poor management
New pasture is typically more productive	• Introduction of newly sown pasture with new genetics will improve dry matter performance per hectare	• The amount will vary, but targeting the poorest producing paddocks could add an additional 3-6 tDM/ha
Control over the seasonality of production	• New pasture cultivars allow a higher degree of control when feed grows during the year. For example, perennial ryegrasses can be selected on heading date, for example Vast with a heading date +36 days later than Nui	• Different types of ryegrasses can add more feed on the shoulders of the growing season by using hybrid and Italian ryegrasses

Consistently higher quality pasture	• Newer pastures will have a higher metabolisable energy due to
	  • Higher proportion of desirable species
	  • Later and more uniform flowering
	  • Leafier sward, with fewer seed heads produced
	  • Less dead material in the base of the pasture
		• Easier grazing management
		  • More palatable to the grazing animal, more harvestable green leaf
		  • Easier to manage seasonal growth and control seed head production
		  • Ability to achieve pre and post grazing targets, optimising pasture growth and quality

Animals are better fed and more animals per hectare	• More production per animal and per hectare	

Source: Turn all your paddocks into high producing pasture. Pasture Renewal Trust

Pasture condition scoring

Condition scoring every paddock on the farm will help determine under -performing paddocks and identify those that may need to be renewed.

USE THIS PASTURE CONDITION SCORE TOOL TO HELP WITH DECISIONS*

Run out paddocks scoring 1-3 will be those to target for undersowing or pasture renovation.

5 **Paddock covered in dense swards of desired grasses and clovers**

No action required. Would be happy if the whole farm was in this state.

4 **Patches of low-level damage, some weeds, less vigorous grasses**

Check soil fertility. Apply autumn nitrogen (N) to encourage tillering. Continue to monitor paddock for further deterioration and address any weed or pest issues.

3 **Large sections of LOW-LEVEL damage, weeds, less vigorous grasses**

Apply autumn N. Undersow in the autumn with perennial ryegrass (longer term solution) containing appropriate endophyte. Perennial ryegrass options include Midway or Accrue sown at 12+ kg/ha.

Address any weed or pest issues that will continue pasture deterioration.
Take soil test and correct any identified fertility issues.

2 **Severe damage in parts, many weeds, patches of bare ground**

Either:

- Undersow with perennial ryegrass in autumn (e.g. Midway or Accrue at 12+ kg/ha), or:
- Undersow with Italian or Hybrid ryegrass (e.g. Lush or Palliser at 15+ kg/ha) in autumn and plan to renew in following 12-18 months.

1 **Severe damage across entire paddock**

Spray out and sow into an annual ryegrass (e.g. Abuzz or Winter Star II at 28-30 kg/ha) if in autumn, and forage crop in spring. Plan to sow in perennial pasture at the end of forage crop rotation.

Adapted from DairyNZ pasture condition score tool

Once you've pasture condition scored the farm, you'll be able to prioritise which paddocks require undersowing verse those that need a full pasture renewal.

PLAN AND PREPARE FOR SUCCESS

Once pastures are scored, implement a pasture renewal programme (see PGG Wrightson Seeds Programmed Approach®) that addresses any limiting factors found during the pasture condition scoring process.

Tips for a positive pasture renewal process:

- Soil test – correct for low pH and nutrient deficiencies
- Determine your pasture renewal programme – PGG Wrightson Seeds Programmed Approach®
- Decide when you need the growth – what is your seasonal growth requirement
- Identify key pasture pest threats in your paddock and region
- Communicate with retailers and contractors
- Prepare a flat, fine, firm and weed free seedbed
- Sow certified quality, treated seed at the correct sowing rate and depth
- Monitor, monitor, monitor
- Control germinating weeds and insect pests
- Implement best practice new pasture management

Best practice for pasture management

The management of a newly sown pasture during the first twelve months post-sowing will have significant long-term effects on botanical composition and persistence.

To develop the 'ideal' pasture, here's how you can graze and take care of it.

FIRST YEAR MANAGEMENT OF NEWLY SOWN PERMANENT PASTURE

- The timing of the initial grazing of newly sown pasture and subsequent management in the following 12 months is key to botanical composition of the sward, and its longer-term productivity and longevity. First grazing can occur at approximately 6-8 weeks after sowing for ryegrass-based pasture, tall fescue and cocksfoot-based pastures may take longer at 8-12 weeks. Ensure that the pasture is consolidated enough so that pulling and pugging are negated. A basic "pull test" will help decide if pastures are ready to graze.
- Ensure pastures are regularly grazed (no higher than 2500 kgDM/ha no lower than 1500 kgDM/ha in the first 12 months). This allows the pasture to reach the 2.5-3 leaf stage (ryegrass example) before grazing, ensuring individual plants build up energy reserves required for tillering and root growth. Do not leave new pasture beyond the third leaf stage as low light levels at the base of the canopy will shade new tillers and clover.
- Avoid cutting paddocks for hay or silage in the first 12 months.
- Spray with a selective broadleaf chemical that is safe to use on clovers at approximately 5-6 weeks depending on speed of establishment after sowing. This will control germinating broadleaf weeds in the new pasture crop. Broadleaf weeds compete with tillering grass for space, light, and moisture.
- Applying nitrogen regularly during establishment will encourage tillering and growth.
- Continue to monitor paddocks on a regular basis, address any factors that may compromise on-going pasture performance.

ONGOING PASTURE MANAGEMENT

Many of the recommendations for new pasture management continue to apply after the establishment period, as persistence is all about maintaining tillers and root mass. A well-established pasture will be more resilient to typical seasonal stresses and grazing requirements; however, a higher standard of ongoing management will considerably extend the lifespan of a pasture.

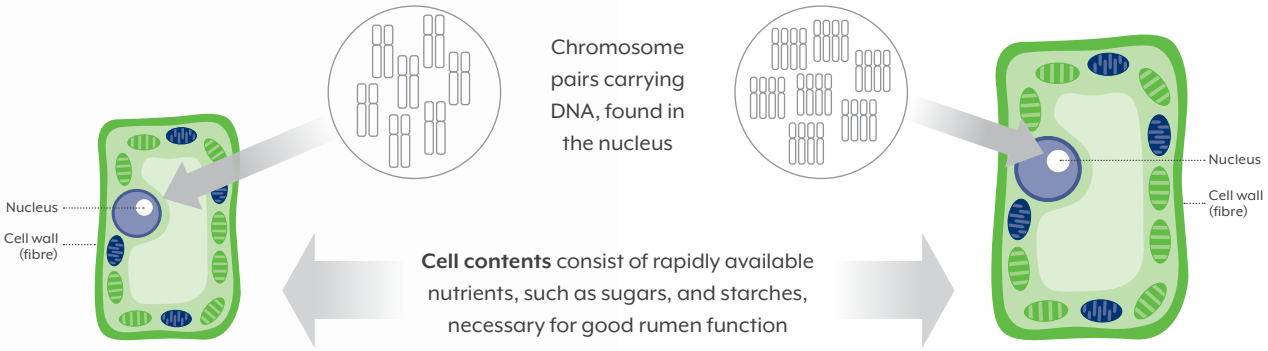
- Ensure that fertiliser requirements are met according to a soil test, yield targets, and control broadleaf weeds.
- During challenging seasons, timely and appropriate adjustment of stocking rates, grazing residuals, and round lengths is essential for recovery and persistence.
- Pasture renewal, particularly with modern cultivars and endophytes, presents the opportunity for improved farm productivity. Cultivar and endophyte options need to be used appropriately to cope with the modern grazing demands and challenges presented by the seasons. Attention to detail is vital and doing the basics well will deliver results.

Tetraploid or diploid ryegrass?

Let's start at the beginning. Ploidy simply means the number of sets of chromosomes in its cells, with diploids having two sets (2n = 14) and tetraploid (4n = 28) having four sets. For ryegrass, ploidy influences plant characteristics. Tetraploid ryegrasses have bigger cells relative to diploids due to the increase in genetic material, which in turn makes the plants and the seeds bigger.

The bigger cells in tetraploids hold more water than diploid cells, which allows for more water-soluble carbohydrates and tend to have a higher cell content to cell wall ratio. Understanding some of the key differences between diploid and tetraploid can help in the decision-making process to the selection of which best matches your requirements.

Diploid 2n=14	Tetraploid 4n=28



Cell contents consist of rapidly available nutrients, such as sugars, and starches, necessary for good rumen function

Lower ratio of cell contents to cell wall

Higher ratio of cell contents to cell wall

DEPENDABLE DIPLOIDS

Densely tillered

Robust and versatile

Competitive with weeds

Ideal for grass to grass situations

Cope with lower fertility

Can handle wetter environments

Able to be set stocked or rotational grazed

Seed Size: A higher sowing rate is needed for tetraploids as the seed is larger

TASTY TETRAPLOIDS

Fast to establish

Extremely tasty and palatable

Excellent pasture utilisation

High pasture quality

Higher animal dry matter intakes

Great clover compatibility

Better animal performance

GRAZING MANAGEMENT TIPS FOR HIGH QUALITY PASTURE

- Avoid persistent overgrazing – the excellent palatability of quality ryegrasses like tetraploids can easily result in pastures being overgrazed. Monitor post-grazing residuals to avoid these getting too low and compromising ryegrass persistence.
- Apply nitrogen as normal – tetraploid ryegrasses are naturally a darker green than diploids but still require similar amounts of nitrogen.

Heading date of ryegrass

- For a specific cultivar, heading date is taken when 50% of the plants seed head has fully emerged.
- Importantly, the 'flush' of growth is seen 4-6 weeks prior to this heading date.
- Ranking of cultivars is relative to Nui which is day '0'.
- Under conditions such as Canterbury, heading date for Nui occurs about the 20th October. However, this can move by up to 3 weeks based on temperature, cold will delay and warm will bring on heading dates.
- Short, long and perennial ryegrasses are categorised into different heading dates to help selection of cultivars that best fit the farm system.

HEADING DATE CATEGORIES

To simplify decision making on which heading date option that suits you, the following table classifies different types and where PGG Wrightson Seeds cultivars fit.

Perennial ryegrasses (Nui = 0)

Mid Season -7 to +7	Late +8 to +21	Very Late +22 to +35	Extremely Late +36
Rely PERENNIAL RYEGRASS (0 days)	Platform PERENNIAL RYEGRASS (+12 days)	Accrue DIPLOID PERENNIAL RYEGRASS (+22 days)	Vast TETRAPLOID PERENNIAL RYEGRASS (+36 days)
Midway DIPLOID PERENNIAL RYEGRASS (+3 days)		Base TETRAPLOID PERENNIAL RYEGRASS (+22 days)	
Excess PERENNIAL RYEGRASS (+7 days)			

Short to long term ryegrasses (Nui = 0)

Mid Season -7 to +7	Late +8 to +21	Very Late +22 to +35	Extremely Late +36
	Delish® TETRAPLOID SHORT ROTATION RYEGRASS (+9 days)	Palliser TETRAPLOID LONG ROTATION RYEGRASS (+25 days)	
	Maverick GII SHORT ROTATION RYEGRASS (+17 days)		

EFFECT OF HEADING DATE ON PASTURE PRODUCTION

- **Mid-season types**– typically provide earlier spring growth than later types. Midway is an example of a mid-flowering perennial ryegrass that has early spring growth required for lambing, calving and fawning.
- **Very or extremely late types** – have a flush of growth up to 3 to 4 weeks later than a mid-flowering type, which distributes the feed profile on farm. Having some later flowering types like Accrue and Vast can help with managing seed head production on farm and lead to improved feed quality.
- With **new cultivars** such as Midway and Accrue, our plant breeders enhance pasture production and quality, both seasonally and annually, as expected from them based on heading date. This is achieved by focusing on traits that contribute to a more even flow of dry matter growth through the year.

Aftermath heading

Definition - Seed head produced after the main heading period.

The production of seed head has a negative effect on feed quality and subsequent animal performance. From a management point of view, reducing the presence of seed heads and maintaining a greater portion of green leaf in a pasture will improve feed quality. There are some tools available to help practically manage potential seed head production, minimising the needs of intervention management practices such as topping.

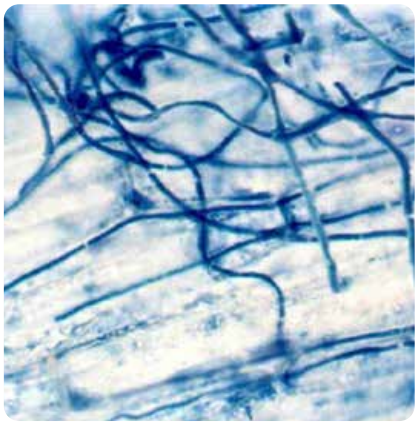
Tools for seed-head management

- Have some paddocks with different heading dates to manage when seed head production occurs across the farm.
- Perennial ryegrasses produce less seed head after the main heading period than ryegrasses with Italian genetics such as short rotation ryegrasses.
- Later flowering perennial ryegrass inherently has a more compressed heading period than most mid-flowering types.
- Our cultivars have specifically been selected for reduced seeding after the main heading period.

Protecting your investment – endophyte

WHAT IS AN ENDOPHYTE?

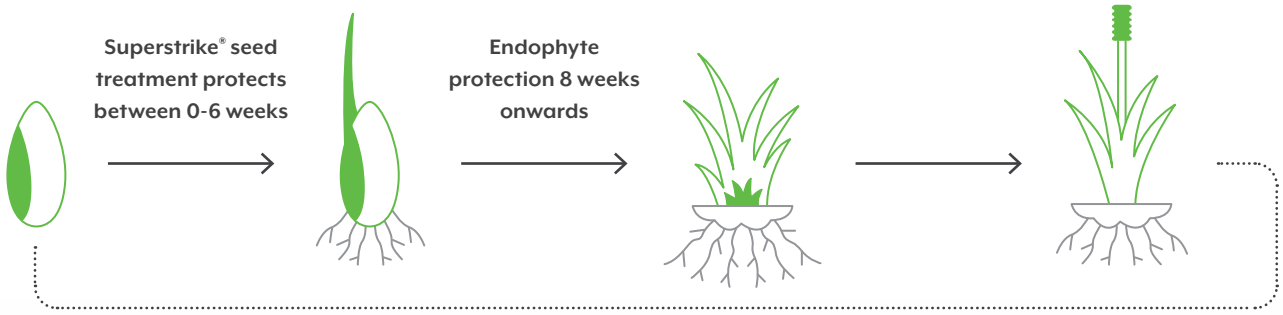
An endophyte is a fungus found naturally in many grass species, including ryegrass and tall fescue. It protects the plant from insects by producing alkaloids, and in return, the plant provides the endophyte with a place to live and reproduce.



AgResearch and Grasslanz Technology, along with PGG Wrightson Seeds, have been at the forefront of identifying novel endophytes that offer superior insect protection for both ryegrass and tall fescue, whilst mitigating risks associated with animal health. The industry leader for janthitrems producing endophytes has been AR37, which has been widely used across New Zealand in multiple ryegrass cultivars for many years. PGG Wrightson Seeds is pleased to announce the release of the next-generation endophyte, AR128.

We recommend using Superstrike® treated grass seed. During establishment, germinating seedlings are susceptible to a range of pasture pests, and seed treatment protects the plant and endophyte during the early stages of growth.

How an endophyte protects your pasture from common insect pests



Endophyte is found in the embryo of an infected seed

The endophyte grows into the emerging leaf as the seed germinates

The endophyte is concentrated in the base of the plant, not in the roots

The endophyte grows up the stem and into the seed head of the reproductive plant

CHELSEA ALABASTER, EASTERN NORTH ISLAND AREA SALES AGRONOMIST, OUT CONNECTING WITH HER FARMERS.

AR37 endophyte

SUITABLE FOR

PESTS CONTROLLED *See insect rating chart on pages 101-102*

Argentine stem weevil larvae, pasture mealy bug, porina, adult black beetle and root aphid

Can be used across New Zealand where management of pasture pests proven to be controlled by AR37 is required and only in sheep, cattle and dairy* livestock farming systems.

BENEFITS

- Proven to increase pasture production compared to the same cultivar with AR1 endophyte, standard endophyte (SE) and low endophyte (LE) where there is a high level of insect pressure
- Greatest, proven range of insect protection available from a ryegrass endophyte
- Increased sheep performance compared to standard endophyte
- Same level of sheep production and dairy milk production when the same cultivar with AR1, LE endophytes were compared
- Less ryegrass staggers than standard endophyte in sheep and cattle
- Over 15 years proven track record of delivery to market across New Zealand in a range of cultivars

**Ryegrasses with AR37 endophyte should not be fed to any other classes of stock other than sheep, beef and dairy (eg, grazing horses/monogastrics).*

AR1 endophyte

SUITABLE FOR

PESTS CONTROLLED *See insect rating chart on pages 101-102*

Argentine stem weevil larvae and pasture mealy bug

Suited to those areas with low pest pressure (areas that have low risk of damage by black beetle, root aphid or porina) or when AR37 is not recommended for deer and horses.

BENEFITS

- Safe for sheep/cattle/dairy, and deer
- Not suitable for high pest pressure regions, especially those regions that are known for black beetle, root aphid or porina

For more information on insect pest ratings and freedom from staggers scores refer to pages 101-103 or ar37endophyte.com

WHAT IS AR128 NOVEL ENDOPHYTE?

In almost every way from an on-farm point of view, it's just the same as AR37. Like AR37 endophyte, AR128 is a selected novel endophyte producing epoxy-janthitrem alkaloids, which offers similar pest protection and risk of ryegrass staggers. (Based on current information available to the end of May 2025).

SO WHY ARE WE REPLACING AR37?

It's a great question. If AR128 is the same as AR37, why replace AR37? The answer lies in some of the other benefits that AR128 brings to the endophytic seed supply chain. For an endophyte to be effective on farm, at least 70% of the seed needs to contain a live endophyte. It's a minimum standard PGG Wrightson Seeds adheres to when selling our cultivars with endophyte; anything lower than this level can potentially affect the total pastures ability to be protected from insect pests. Multiple factors affect the ability to achieve 70% or greater live endophyte infection, including transmission e.g. the endophyte transmitting (passing from one generation of seed to the next) when being multiplied and storage (primarily this is affected by temperature and, more importantly, humidity). Quite simply, AR128 is a more robust endophyte for both transmission and storage than AR37, hence more reliability in delivering seed to the market. Thus, at farm level, not much has changed, with the same level of insect pest protection for your ryegrass pasture achieved by AR37, but AR128 makes it easier for PGG Wrightson Seeds and your retailer to ensure the seed you receive has the 70% minimum live endophyte level to give your pastures and farm the insect protection you are seeking.

WHEN DO I SEE AR128?

The first availability of AR128 was in autumn 2025 (in Palliser) with increasing availability through 2026. More cultivars will be available with AR128 as we transition from AR37, so watch this space.

New AR128 endophyte now available

MIKE NORRIS, PROGRAMME LEADER GRASSES.

SUITABLE FOR

PESTS CONTROLLED *See insect rating chart on page 102*

Additional pest protection for adult black beetle, root aphid, field cricket

Max P® is a novel tall fescue endophyte that improves the ability of tall fescue pastures to handle pest attack and moisture stress. Unlike ryegrass endophyte, Max P® endophyte produces a loline compound. This compound, along with peramine, is likely to be a key factor in providing protection against, adult black beetle and root aphid. Max P® can improve the drought tolerance of tall fescue. In areas where there are few insect pests and little moisture stress, Max P® may not be essential, but may still improve pasture production.

Recommended to help protect Quantica tall fescue from pasture pests.

BENEFITS

- Additional pest protection for adult black beetle, root aphid, field cricket and grass grub
- No known adverse effects in sheep/beef and dairy

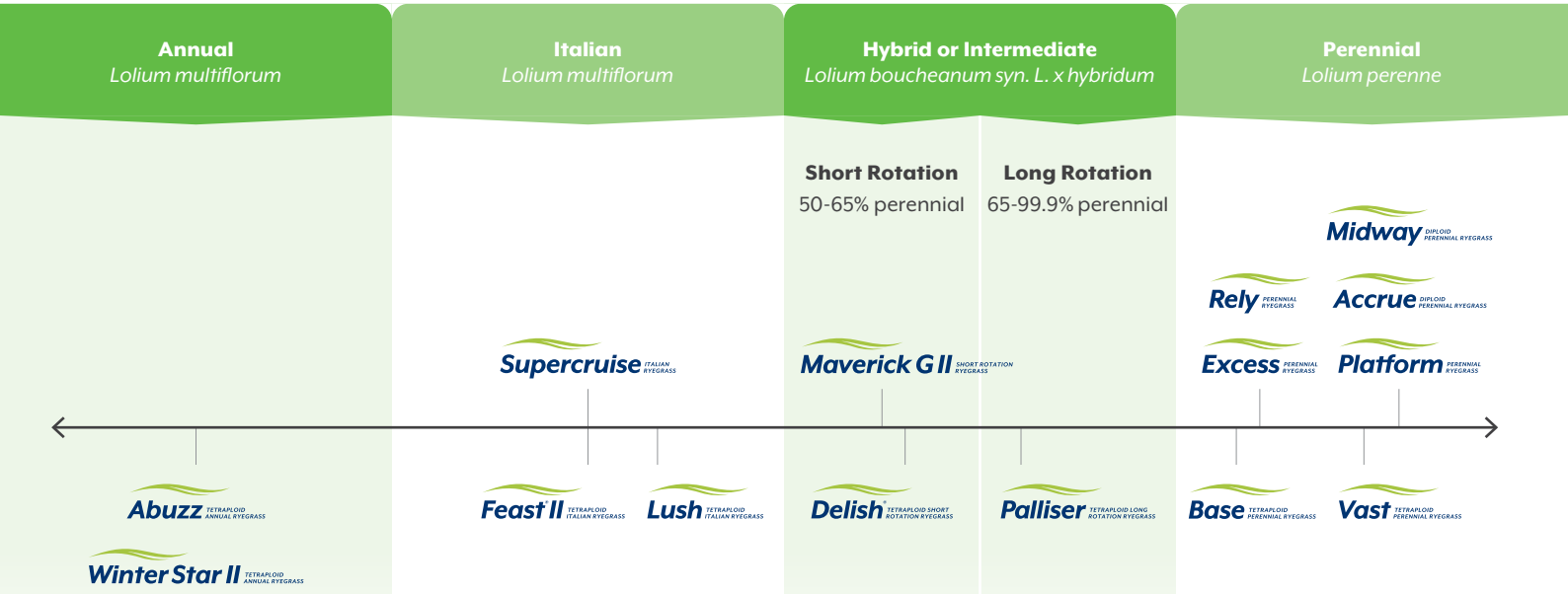
For more information on insect pest ratings and freedom from staggers scores refer to pages 101-103 or ar37endophyte.com

Max P® endophyte

The ryegrass continuum – we have every category covered

PGG Wrightson Seeds
Programmed Approach®

PGG Wrightson Seeds offers a range of ryegrass cultivars. The continuum below offers a flexible range of genetics, from short term to long term options, designed to match farm systems, maximise pasture performance and support year-round feed supply.



CSA COOL SEASON ACTIVE

Pros:
Cool season active
Rapid establishment

Cons:
Shorter lived
More summer seed head

WSA WARM SEASON ACTIVE

Pros:
Warm season active
Fewer summer seed head

Cons:
Slower establishment
Winter semi-dormant

Perennial Ryegrasses

LONG, LASTING QUALITY

Our extensive range of high quality, proprietary perennial ryegrasses are bred to help farmers achieve their livestock production goals now and into the future. In summary, the following options are available this coming year:

Cultivar	Ploidy	Heading Date	Endophyte	More Information
Midway	Diploid	Mid (+3)	AR37, AR1*	Page 28
Accrue	Diploid	Very Late (+22)	AR37, AR1*	Page 29
Vast	Tetraploid	Extremely late (+36)	AR37, AR1	Page 30
Base	Tetraploid	Very Late (+22)	AR37, AR1	Page 31
Platform	Diploid	Late (+12)	AR37, AR1	Page 31
Excess	Diploid	Mid (+7)	AR37, AR1	Page 32
Rely	Diploid	Mid (+0)	AR37, AR1	Page 32

Ex-harvest 2026

RICHARD GOLDIE, CENTRAL SOUTH ISLAND AREA SALES AGRONOMIST, CROUCHED IN A PADDOCK OF VAST PERENNIAL RYEGRASS.

Early-season yield that goes the distance

NEW

Midway DIPLOID PERENNIAL RYEGRASS

Scan to learn more about Midway

FARM TYPE AR37 AR128 ** AR128 ex harvest 2026* AR1 **Ex harvest 2026*

SOWING RATE STANDARD **15-25 kg/ha** UNDERSOWING **12+ kg/ha**

HEADING DATE **Mid +3 days**

NEW ZEALAND BRED

Midway is a mid-season flowering ryegrass that not only has strong cool season growth but has significantly improved dry matter production in summer/autumn. It also has strong persistence (AR37), good tiller density, excellent rust tolerance, and selection for spring/summer quality through reduced aftermath seed heading.

Choose Midway for added value in that early spring feed prior to and post lambing and calving without compromising on strong pasture growth in the following seasons.

- Strong, year-round dry matter production
- Mid-season heading (Mid +3)
- Strong persistence (AR37)
- Selected for low aftermath heading
- Strong rust tolerance

DRY MATTER PRODUCTION

Midway is a mid-season flowering ryegrass that has not only strong cool season growth but has significantly improved dry matter production in the summer/autumn period.

Average seasonal and annual dry matter production of perennial ryegrass relative to trial mean (100), sown 2022 at Kimihia Research Centre, Lincoln (two years).

Entry	Winter	Early Spring	Late Spring	Summer	Autumn	Total
Midway AR37	**107**	**103**	**97**	**109**	**125**	**107**
Platform AR37	103	96	105	109	92	101
Expo AR37	99	98	103	94	87	97
Rely AR37	91	102	95	88	96	95
Trial Mean (kg DM/ha)	2,116	2,916	4,831	3,017	2,338	15,244
LSD (5%)	7	6	8	12	10	7

EXAMPLE PASTURE MIXES

Dairy Pasture Mix

Midway perennial ryegrass 21 kg/ha
Legacy white clover 2 kg/ha
Quartz white clover 2 kg/ha

Sheep & Beef Pasture Mix

Midway perennial ryegrass 21 kg/ha
Quartz white clover 2 kg/ha
Hilltop white clover 2 kg/ha
Amigain red clover 4 kg/ha
Puna II chicory 1 kg/ha

Deer Pasture Mix

Midway perennial ryegrass 18 kg/ha (AR1 only)
Quartz white clover 2 kg/ha
Hilltop white clover 2 kg/ha
Amigain red clover 4 kg/ha
Puna II chicory 2 kg/ha

For increased animal performance, nitrogen fixation and pasture management, add Amigain red clover to pasture mixes at 4-6 kg/ha.

High yields all year round

NEW

Accrue DIPLOID PERENNIAL RYEGRASS

Scan to learn more about Accrue

FARM TYPE AR37 *Ex harvest 2026

SOWING RATE STANDARD **15-25 kg/ha** UNDERSOWING **12+ kg/ha**

HEADING DATE **Very Late +22 days**

NEW ZEALAND BRED

Accrue is the latest generation, very late-flowering (+22 days) diploid perennial ryegrass from PGG Wrightson Seeds. Year-round production of dry matter, with a key focus on growth during the summer/autumn period, is what makes Accrue a standout in this category. Accrue perennial ryegrass has been selected for improved quality characteristics, including reduced seed head production and improved rust tolerance during the summer and autumn months, making it a versatile choice for all farm systems.

A combination of strong tiller density and AR37 endophyte means Accrue will suit both rotational and set-stocked grazing systems.

- Strong, year-round dry matter production
- Very late-flowering heading date
- Selected for improved feed quality during summer/autumn
- Improved soluble carbohydrate to protein ratio
- Low aftermath heading
- High tiller density

DRY MATTER PRODUCTION

As demonstrated in trials, summer/autumn growth is a standout for Accrue leading to high overall seasonal performance.

Relative seasonal and annual dry matter yield of diploid perennial ryegrass cultivars at Ruakura, Waikato 2021-2024. Trial Mean (kg DM/ha) = 100

Entry	Winter	Early Spring	Late Spring	Summer	Autumn	Total
Accrue AR37	**108**	**105**	**99**	**119**	**114**	**107**
Expo AR37	100	97	95	97	96	99
Rely AR37	93	97	106	84	89	93
Trial Mean (kg DM/ha)	1,730	2,211	2,898	2,061	2,234	11,175
LSD (5%)	9	11	9	11	13	6

EXAMPLE PASTURE MIXES

Dairy Pasture Mix

Accrue perennial ryegrass 21 kg/ha
Legacy white clover 2 kg/ha
Quartz white clover 2 kg/ha

Sheep & Beef Pasture Mix

Accrue perennial ryegrass 21 kg/ha
Quartz white clover 2 kg/ha
Hilltop white clover 2 kg/ha
Amigain red clover 4 kg/ha
Puna II chicory 1 kg/ha

For increased animal performance, nitrogen fixation and pasture management, add Amigain red clover to pasture mixes at 4-6 kg/ha.

The rule breaking ryegrass

Vast TETRAPLOID PERENNIAL RYEGRASS

Scan to learn more about Vast

FARM TYPE | **SOWING RATE** STANDARD 22-28 kg/ha | **HEADING DATE** Extremely Late +36 days

Vast is the next generation in tetraploid perennial ryegrass breeding delivering the ultimate combination of density, quality, production and grazing preference for New Zealand farmers to maximise stock performance and productivity.

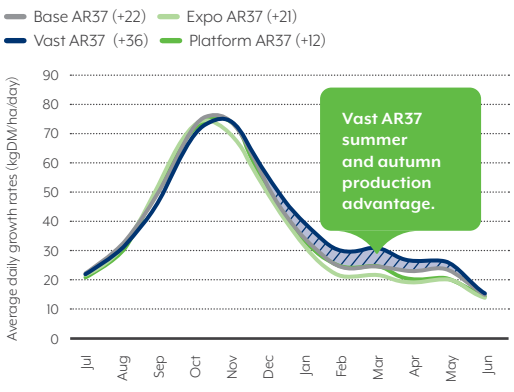
With an extremely late (+36 days) heading date, Vast offers the latest heading date on the market. Low seed head production after the initial seeding period in combination with a very late flowering date means Vast will provide high quality feed across the majority of growing season.

- Strong annual production with exceptional summer and autumn productivity
- Extremely late heading date (+36 days) boosting late spring pasture quality
- Diploid-level tiller density to enhance persistence
- Tetraploid grazing preference to drive animal intakes
- Excellent rust tolerance to improve summer and autumn palatability

DRY MATTER PRODUCTION

Vast provides strong annual production with exceptionally strong summer and autumn season production advantages. Dry matter production is complemented with diploid level tiller density to enhance persistence.

Average daily growth rates of perennial ryegrass cultivars across four trials in Canterbury (2) and Waikato (2)



Data is the combined mean of 4 three year trials completed in Canterbury (2) and Waikato (2). The value in brackets beside each cultivar name is the cultivar's heading date relative to Nui.

EXAMPLE PASTURE MIXES

Dairy Pasture Mix

Vast perennial ryegrass 25-28 kg/ha
Legacy white clover 2 kg/ha
Quartz white clover 2 kg/ha

Sheep & Beef Pasture Mix

Vast perennial ryegrass 22-28 kg/ha
Quartz white clover 2 kg/ha
Hilltop white clover 2 kg/ha

For increased animal performance, nitrogen fixation and pasture management, add Amigain red clover to pasture mixes at 4-6 kg/ha.

High quality feed, maximum production

Base TETRAPLOID PERENNIAL RYEGRASS

FARM TYPE	AR37	AR1	
SOWING RATE	STANDARD 22-28 kg/ha	HEADING DATE	Very Late +22 days

Ideal for high performance systems with a focus on pasture management and quality. Base tetraploid perennial ryegrass offers top production with increased animal preference, meaning higher animal intakes and easier management of post-grazing residuals.

Base was selected from high yielding, densely-tillered plants that survived two years of severe drought and hard grazing. Base pastures offer low aftermath heading to maximise summer quality and animal production.

- Exceptional yielding tetraploid perennial ryegrass
- Excellent cool season yields
- Very high tiller density
- AR37 endophyte for strong persistence
- Excellent for dairy and intensive sheep/beef systems
- Best suited to rotational grazing

Scan to learn more about Base

The quality all-round performer

Platform PERENNIAL RYEGRASS

FARM TYPE	AR37	AR1	
SOWING RATE	STANDARD 15-25 kg/ha UNDERSOWING 12+ kg/ha	HEADING DATE	Late +12 days

Platform is a persistent diploid perennial ryegrass# offering high yields of quality feed and year-round dry matter production. Outstanding quality is achieved through low aftermath seed head production and fine dense tillers making it a versatile option for productive environments.

Platform has performed strongly in New Zealand trials, demonstrating year-round growth with noted summer/autumn productivity.

- High yielding with strong year-round production
- Excellent feed quality
- Fine leaf with high tiller density
- Late heading date (+12 days)
- Strong persistence (AR37)

#Platform has been bred, selected and successfully tested as a perennial and will function as a perennial ryegrass. Due to a small number of tip awns, Platform is certified as Lolium boucheanum.

Scan to learn more about Platform

Early feed for lighter soils

The resilient option for tougher conditions

Excess PERENNIAL RYEGRASS

FARM TYPE

SOWING RATE STANDARD **15-25 kg/ha** UNDERSOWING **12+ kg/ha**

HEADING DATE **Mid** **+7 days**

Excess is a medium-leaved, diploid perennial ryegrass bred specifically for tougher environments. It produces exceptionally high dry matter yields and the mid-season heading date provides an earlier flush of spring growth that makes it ideal for lambing and calving. Excess is a tried and tested perennial ryegrass offering excellent production in more challenging soil types.

- Excellent dry matter production
- Strong persistence (AR37)
- Mid-season heading (+7 days)
- Exceptional summer, autumn and winter growth
- Low aftermath seed head emergence
- Proven performance in upper North Island National Forage Variety Trials

Scan to learn more about Excess

Rely PERENNIAL RYEGRASS

FARM TYPE

SOWING RATE STANDARD **15-25 kg/ha** UNDERSOWING **12+ kg/ha**

HEADING DATE **Mid** **+0 days**

Rely perennial ryegrass is a versatile diploid with fine leaves and dense tillers bred to cater for a range of environments. Rely is a resilient option that can tolerate lower soil fertility and periods of set stocking.

- Excellent dry matter in challenging conditions
- Strong persistence (AR37)
- Fine leaf and dense tillers
- Good rust tolerance
- Very good summer, autumn and winter growth

Scan to learn more about Rely

Short & Long Rotation Ryegrasses

THE FLEXIBLE, MULTI-PURPOSE FORAGE

If you need a ryegrass option that is needed for 2-5 years, either as a specialist high quality, high production pasture or for under-sowing into existing permanent pasture, then consider the following options below:

Cultivar	Ploidy	Heading Date	Endophyte	More Information
Palliser	Tetraploid	Very late (+25)	AR128, AR37, AR1	Page 34
Delish	Tetraploid	Late (+9)	AR1, LE	Page 35
Maverick GII	Diploid	Late (+17)	Without	Page 35

A versatile multi-purpose ryegrass

NEW

Palliser *TETRAPLOID LONG ROTATION RYEGRASS*

Scan to learn more about Palliser

FARM TYPE

SOWING RATE PURE STAND **22-28 kg/ha**
UNDERSOWING **15 kg/ha**
SECONDARY COMPONENT OF MIX **7-14 kg/ha**

HEADING DATE **Very Late +25 days**

Palliser is a very late flowering (+25 days) tetraploid ryegrass with the flexibility to be used as a short or long rotation type. It is high yielding with strong summer and autumn production, high quality and persistence (AR37 and AR128 endophyte) for a hybrid type ryegrass.

Palliser was selected from elite plants created by a cross between tetraploid Italian and perennial ryegrasses with AR37. Palliser has strong rust tolerance and high tiller density, with a focus on plant survival under grazing.

Palliser is best suited in high performance animal production mixes with clovers and herbs, adding cool season growth when used in mixtures with perennial ryegrasses or for repairing and under sowing pastures to extend longevity.

Versatile, high yielding and high quality long or short-term ryegrass

- Can be used as either a short or long rotation ryegrass
- More rapid establishment than diploid types
- High dry matter yields throughout the year
- High palatability
- Excellent summer forage quality (very late flowering, low aftermath heading, and improved rust tolerance)
- Ideal for under-sowing pastures

Annual dry matter yield performance (kg DM/ha) at two regional sites, Ruakura, Hamilton and Lincoln, Canterbury, 2019-2021.

	Ruakura, Hamilton		Lincoln, Canterbury	
	Year 1	Year 2	Year 1	Year 2
Palliser	**17,017**	**11,425**	**20,691**	**13,257**
Feast II	12,867	0	17,465	9,630
Supercruise	12,384	0	16,307	9,764
LSD (5%)	1,177	414	1,171	1,008

The flexible forage

Delish® TETRAPLOID SHORT ROTATION RYEGRASS

FARM TYPE

SOWING RATE PURE STAND **22-28 kg/ha** UNDERSOWING **14 kg/ha** SECONDARY COMPONENT OF MIX **4-7 kg/ha**

Delish® tetraploid short rotation ryegrass – the hybrid providing the best of both worlds. Not only is it a tasty tetraploid but also an Italian ryegrass crossed with a perennial ryegrass, providing you with the best attributes of each. Rapid, reliable establishment coupled with good early season growth, reduced aftermath heading for good summer feed quality and greater longevity than an Italian ryegrass.

- More rapid, reliable establishment than diploid types
- Improved disease resistance
- Ideal for undersowing
- High palatability
- Excellent summer forage quality (low aftermath heading)
- High dry matter yields throughout the year

Scan to learn more about Delish

The top gun

Maverick G II SHORT ROTATION RYEGRASS

FARM TYPE Without Endophyte

SOWING RATE STANDARD **20 kg/ha** UNDERSOWING **12 kg/ha** SECONDARY COMPONENT OF MIX **4-7 kg/ha**

Wanting cool season growth but needing a grass that persists longer than Italian ryegrasses? Maverick GII is a diploid, short rotation ryegrass providing excellent cool season growth. Maverick GII is the perfect grass for high performance stock or for silage cropping.

- Robust, dense sward with exceptional cool season growth
- Excellent summer quality (low aftermath heading)
- Good disease resistance and persistence
- Ideal for undersowing
- High annual yield
- Suitable for high quality silage

Scan to learn more about Maverick GII

Italian & Annual Ryegrasses

FILLING THE FEED GAP

Whether it's a short-term Italian Ryegrass for 1-3 years or a short-term Annual Ryegrass for 6-8 months, the PGG Wrightson Seeds proprietary range has an option for every scenario.

Cultivar	Ploidy	Endophyte	More Information
Lush	Tetraploid	AR37, LE	Page 37
Feast II	Tetraploid	Without	Page 38
Supercruise	Diploid	Without	Page 38
Abuzz*	Tetraploid	Without	Page 39
Winter Star II	Tetraploid	Without	Page 40

**Ex-harvest 2026*

Luscious, high yielding, persistent feed

Lush TETRAPLOID ITALIAN RYEGRASS

Scan to learn more about Lush

FARM TYPE AR37 LE*

*Low Endophyte

SOWING RATE
STANDARD **22-28 kg/ha**
UNDERSOWING **15+ kg/ha**
SECONDARY COMPONENT OF MIX **4-7 kg/ha**

NEW ZEALAND BRED

Lush tetraploid Italian ryegrass – a luscious quality forage. Rarely has a tetraploid Italian ryegrass delivered such outstanding summer feed quality, high yield potential and persistence.

- Quick to establish and short time to first grazing
- Exceptional summer yield and forage quality (low aftermath heading)
- Ideal for undersowing into those opened up and thinned out pastures, as part of a pasture mix or sown as a pure sward
- Strong second year production – better than traditional Italian ryegrasses, offering feed for longer
- Good rust tolerance supports higher dry matter yields and increased palatability for grazing animals
- The first tetraploid Italian ryegrass available with AR37 endophyte*

*It should be noted that Lush AR37 may cause ryegrass staggers. For more information on AR37 endophyte visit www.ar37endophyte.com

TIPS AND TRICKS FOR UNDER-SOWING

In late summer/early autumn, while soil temperatures are still high, perennial ryegrass is a good option for undersowing. As the days shorten and soil temperatures drop below 12°C, we should switch to Italian (e.g. Lush AR37) and annual ryegrasses (e.g. Winter Star II) as they are much faster to establish and have better cool season activity.

Early undersowing allows seedling establishment to occur in more favourable conditions, which in turn maximises establishment, tillering and early dry matter production. By comparison, later undersowing may result in missing out on favourable growing conditions and the opportunity to produce valuable winter feed, while increasing the risk of invasive grasses and weeds establishing.

Timing: Aim to undersow paddocks before bare areas are filled in with unproductive grass and broadleaf weeds. Ideally, paddocks should be hard grazed to minimise competition during the establishment phase.

Early Grazing Management: Graze undersown paddocks when seedlings pass the 'pull test'. Avoid accumulating large covers as this will shade out recently sown seedlings and reduce tillering.

The trusted performer

Feast® II TETRAPLOID ITALIAN RYEGRASS

FARM TYPE Without Endophyte

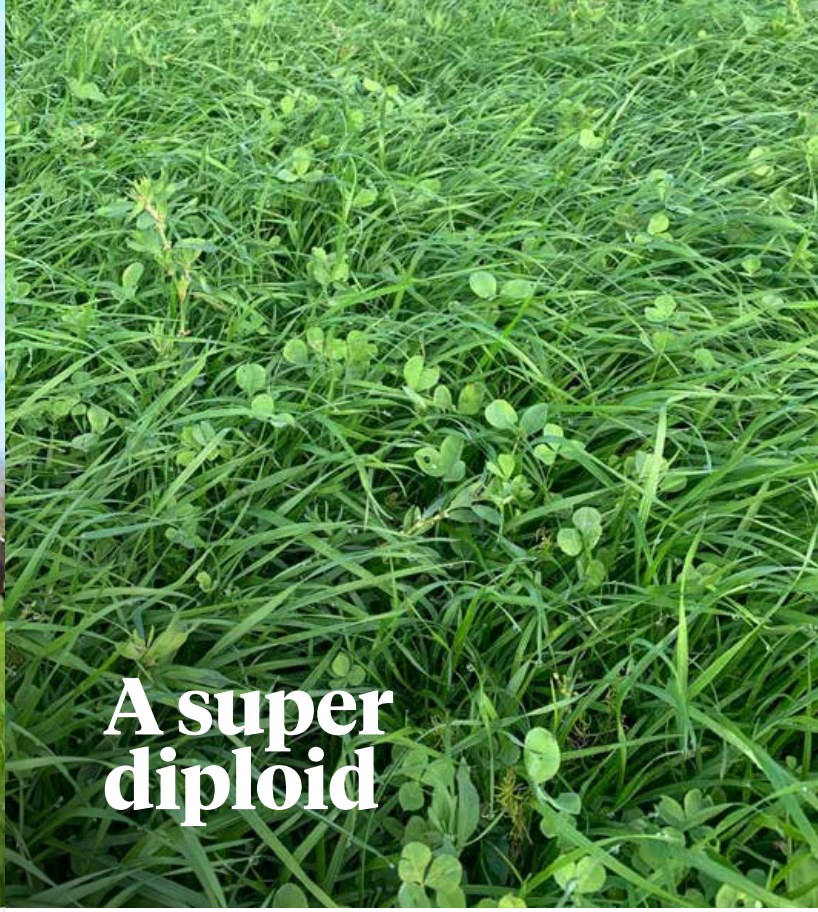
SOWING RATE STANDARD **22-28 kg/ha**
UNDERSOWING **15+ kg/ha**

Feast® II tetraploid Italian ryegrass – trusted name, trusted ryegrass. Feast II is a high yielding ryegrass with strong winter and early spring dry matter production followed by low aftermath heading for outstanding summer quality.

Feast II is suitable as a specialist crop for grazing animals or silage production, while also being ideal for undersowing into existing pastures for a flush of winter growth of high quality feed.

- High dry matter production
- More rapid and reliable establishment than diploid types
- Outstanding summer quality for a high yielding Italian ryegrass (low aftermath heading)
- Superior disease resistance and enhanced persistence
- Enhanced palatability and acceptance by animals
- Ideal for high quality silage

Scan to learn more about Feast II



A super diploid

Supercruise ITALIAN RYEGRASS

FARM TYPE Without Endophyte

SOWING RATE STANDARD **15-25 kg/ha**
UNDERSOWING **10-15 kg/ha**

Supercruise is a fast-establishing diploid Italian ryegrass for the New Zealand market. Displaying all the required attributes of a high quality diploid Italian ryegrass, Supercruise has the endurance to go the distance.

If you are looking for a cost-effective, short-term pasture or a reliable option for undersowing into worn-out perennial pastures, Supercruise is the grass for you.

- Robust diploid Italian ryegrass
- Super-fast establishment
- Great late spring/early summer dry matter production
- High yields of quality feed

Scan to learn more about Supercruise

Light years ahead

NEW

Abuzz TETRAPLOID ANNUAL RYEGRASS

Scan to learn more about Abuzz

FARM TYPE Without Endophyte

SOWING RATE STANDARD **25+ kg/ha**
UNDERSOWING **14+ kg/ha**

NEW ZEALAND BRED

Abuzz is the next generation tetraploid annual ryegrass replacing the legendary cultivar, Winter Star II. Plant breeders have delivered a cultivar with superior dry matter production and disease tolerance relative to its predecessor, Winter Star II.

Abuzz has the ability to provide valuable feed from late autumn into spring and early summer. It has excellent recovery from grazing, holds on till summer, and can also be used for silage.

- Fast establishment
- Late summer/autumn sown option for high quality and quantity autumn, winter and spring feed.
- High rust tolerance
- Ideal between maize crops
- Quick early feed for grazing animals or silage production
- Offers flexibility into a system, potential for under-sowing into autumn pastures

DRY MATTER PRODUCTION

Extensive testing of Abuzz has occurred across the country. These are just some examples of the trials completed to date.

Relative seasonal and annual dry matter accumulation of annual ryegrasses sown on 29th April 2020 at Ruakura, Waikato.
Trial Mean (kg DM/ha) = 100

Entry	Autumn	Winter	Early Spring	Late Spring	Total Yield 1st Oct	Total Yield 1st Dec
Abuzz	**128**	**112**	**119**	**119**	**118**	**118**
Hogan	110	111	97	114	99	104
Zoom	85	89	102	95	99	98
Winter Star II	118	103	101	85	104	97
Dash	99	99	95	96	96	96
Sultan	59	86	86	91	83	86
Trial Mean	219	1,246	3,284	2,548	4,711	7,259
LSD (5%)	21	13	16	33	16	19

More feed faster

Winter Star II

TETRAPLOID ANNUAL RYEGRASS

Scan to learn more about Winter Star II

FARM TYPE Without Endophyte

SOWING RATE STANDARD **25+ kg/ha**
UNDERSOWING **15+ kg/ha**

NEW ZEALAND BRED

Winter Star II is suitable for quick winter feed with improved spring quality, making it ideal for silage and hay production. It is high yielding with fast establishment, giving excellent autumn growth. As a tetraploid, Winter Star II also has excellent feed quality.

- Ideal between maize crops
- Fast to establish
- Quick, early feed for grazing animals or silage production
- Autumn sow for high yields of quality autumn, winter and spring feed
- Improved spring production and forage quality
- Ideal for undersowing into existing pastures

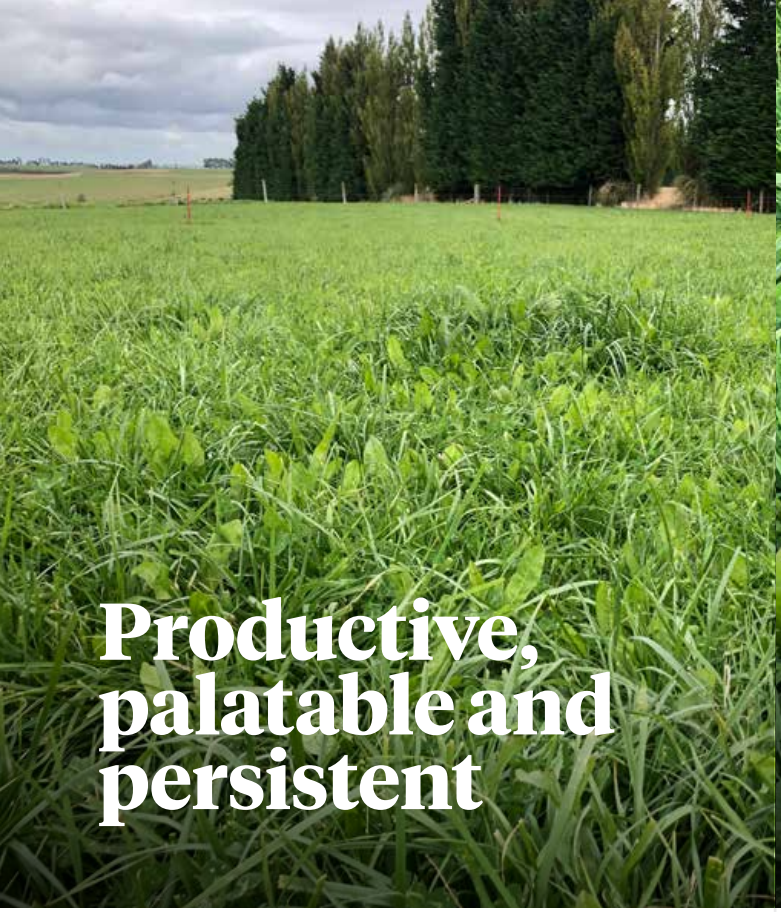
Alternative Grasses

DELIVERING WHEN THINGS GET TOUGH

To enhance the resilience of your permanent pastures, consider adding tall fescue or cocksfoot into your farm system.

Cultivar	Type	Endophyte	More Information
Quantica	Tall Fescue	Max P	Page 42
Aurus	Cocksfoot	Without	Page 42

MAGGIE WHITE, UPPER NORTH ISLAND FORAGE AGRONOMIST.



Productive, palatable and persistent

Quantica TALL FESCUE

NEW ZEALAND BRED

FARM TYPE MaxP

SOWING RATE STANDARD **22-32 kg/ha**

Quantica is a soft, finely-leaved continental tall fescue selected by plant breeders for improved animal palatability and rust resistance. A deep-rooted, robust and productive variety, offering greater persistence than perennial ryegrass. Quantica is able to tolerate waterlogging, soil salinity, Grass Grub pressure and summer dry conditions.

- Soft fine leaves provide increased palatability
- High yielding with improved cool season growth
- Excellent dryland production and autumn drought recovery
- Good disease (crown rust) resistance
- Low aftermath heading
- New Zealand bred for local conditions

Scan to learn more about Quantica

The dryland constant

Aurus COCKSFOOT

FARM TYPE

SOWING RATE STANDARD **6-10 kg/ha**
SECONDARY COMPONENT OF PASTURE MIX **1-3 kg/ha**

Aurus is an upright cocksfoot providing strong summer production and persistence well suited to challenging dryland environments. Aurus' upright growth habit enhances its compatibility with high performing clover varieties, ideal for maximising nitrogen fixation. Plant breeders have selected Aurus for superior yield, strong disease tolerance and a later heading date (+6 days later than Tekapo).

- High yielding variety with improved winter activity over Tekapo
- Upright growth habit allowing high clover content
- Strong persistence
- Excellent drought tolerance
- Suitable for set stocking and hard rotational grazing by sheep
- Excellent *Drechslera* tolerance observed in New Zealand trials

Scan to learn more about Aurus

Clovers

DUAL POWER OF PRODUCTION AND NITROGEN

The powerhouse of any pasture is the clover, increasing animal production and performance whilst fixing nitrogen back into the soil. Our range of proprietary clovers have been developed to complement a range of farming systems and be competitive with the very best of our grasses.

Cultivar	Type	More Information
Quartz	White Clover - medium leaf	Page 44
Legacy	White Clover - large leaf	Page 45
Hilltop	White Clover – small leaf	Page 45
Amigain	Red Clover	Page 46
Bindoon	Sub Clover	Page 47
Taipan	Balansa Clover	Page 47

Clover performance that's rock solid

GRASSLANDS
Quartz MEDIUM LEAF WHITE CLOVER

Scan to learn more about Quartz

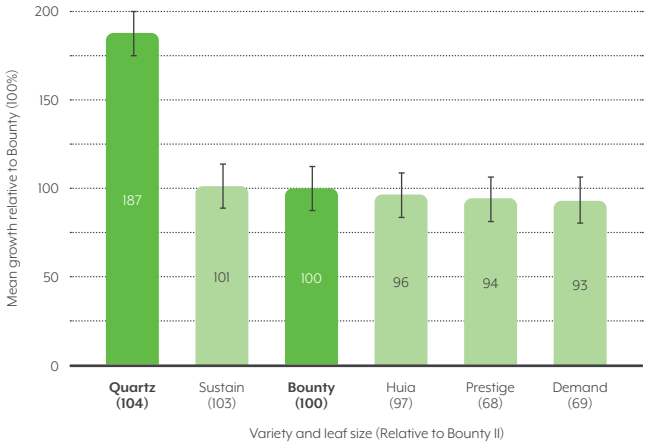
FARM TYPE

SOWING RATE STANDARD **4-6 kg/ha**
Superstrike® Quartz with grass and herb components

A persistent white clover with broad adaptability across environments and farm systems. Quartz performs well under dairy, sheep and beef grazing management. A high yielding clover with good stolon density that provides excellent persistence.

- Excellent fit across multiple farm systems
- High yielding
- Versatile option that has broad adaptability across a range of conditions
- Used in pasture, specialist and renovating mixes
- Excellent persistence

Performance of clover cultivars in perennial ryegrass sward under beef cattle grazing, Manawatu.



Trial conducted by AgResearch in Manawatu over four years (2011-2015) under rotational grazing. Clovers were grown with diploid perennial ryegrass containing AR37 endophyte.

Bigger leaves, bigger legacy

GRASSLANDS **Legacy** LARGE LEAF WHITE CLOVER

FARM TYPE

SOWING RATE STANDARD **4-6 kg/ha**
Superstrike® Legacy with grass and herb components

Legacy is a high performing, large leaf white clover well suited to rotational grazing in both dairy and drystock cattle systems. Dry matter yield strengthens over time.

Legacy has a vigorous growth rate that improves its tolerance to Clover Root Weevil. A tall growth habit ensures Legacy can persist and perform in a modern pasture sward, making it easier for animals to graze.

- High performing, large leaf clover
- Dry matter yield strengthens with time
- Increased yield leads to more nitrogen (N) being fixed, reducing the need for N fertiliser application
- Good option for rotational grazing
- Large leaf captures more sunlight, leading to higher yields

Scan to learn more about Legacy

The hill country constant

GRASSLANDS **Hilltop** SMALL-MEDIUM LEAF WHITE CLOVER

FARM TYPE

SOWING RATE STANDARD **4-6 kg/ha**
Superstrike® Hilltop with grass and herb components

Bred to cope with more challenging environments from variable soil fertility to variable moisture availability, Hilltop is a very robust and persistent small-medium leaf white clover.

- Good persistence due to high stolon density, enabling it to tolerate a set stocking grazing system
- New Zealand bred to be competitive against invasive grasses such as browntop
- Good option for low soil fertility and summer dry conditions
- Well suited to wet and dry conditions of hill and high country grazing systems
- Oversowing option with Prillcote® seed treatment

Scan to learn more about Hilltop

Liveweight gain with Amigain

GRASSLANDS Amigain RED CLOVER

Scan to learn more about Amigain

FARM TYPE

SOWING RATE

PERENNIAL PASTURE MIX **4-6 kg/ha** Superstrike® Amigain
SHORT TERM PASTURE MIX **6-8 kg/ha** Superstrike® Amigain

RED CLOVER STAND
10-12 kg/ha Superstrike® Amigain
2-3 kg/ha Superstrike® Quartz White clover

NEW ZEALAND BRED

Amigain is the latest generation red clover bred in New Zealand for increased persistence and performance in permanent pastures, high performance short-term pastures and pure sward red clover stands.

In a pasture mixture, Amigain provides spring, summer and autumn productivity ideal for increased animal performance, enhancing pasture management and fixing nitrogen.

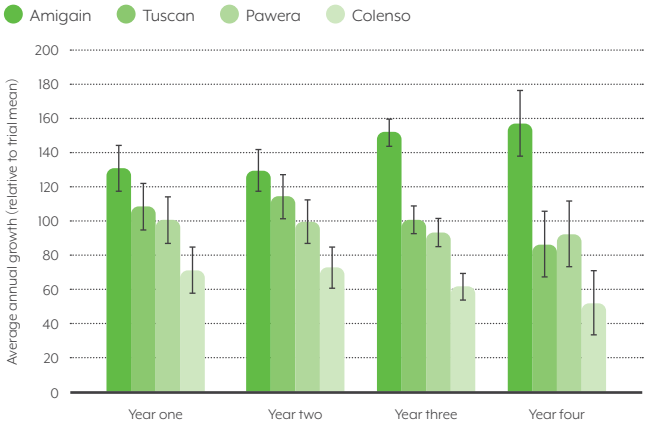
As a specialist multi-year crop, Amigain provides high quality feed ideal for liveweight gain and/or improved condition scores of priority stock classes in sheep and deer systems.

- Bred to persist and perform in both pasture mixes and red clover stands
- Semi-prostrate growth habit to enhance persistence
- Excellent quality suitable for driving animal production
- Selected for a more fibrous root system
- Low formononetin (oestrogen) levels
- Increased Clover Root Weevil tolerance compared to white clover

PERFORMANCE OF AMIGAIN RED CLOVER IN A PERENNIAL RYEGRASS SWARD

When trialled in a mixed perennial ryegrass sward at Aorangi, Palmerston North (2012-2015) under beef cattle grazing, Amigain persisted extremely well with relative yield strengthening over time as the performance of traditional cultivars declined.

Performance of red clover varieties in a perennial ryegrass sward



Aorangi, Palmerston North (2012-2015)

The dryland starter

Bindoon SUB CLOVER

FARM TYPE

SOWING RATE
STANDARD PASTURE MIX **4-6 kg/ha** Superstrike® or Prillcote®
SPECIALIST STAND **8-12 kg/ha** Superstrike®

Subterranean clover (*Trifolium subterraneum*) is a prostrate annual clover well-suited to true dryland environments where white clover struggles to persist.

Bindoon was bred to replace traditional sub clover varieties and is recognised for its cool season productivity due to its high seed production and dense seedling regeneration.

Bindoon sub clover displays a very prostrate growth habit and produces a low, dense sward. Although relatively soft-seeded, it sets sufficient seed to ensure the reliable regeneration of plant populations.

- Highly productive, early- to mid-season subterranean clover
- Suited to summer dry conditions with well-drained soils
- Resistant to Red Legged Earth Mite
- Excellent seed set for increased persistence

Scan to learn more about Bindoon

The resilient performer

Taipan BALANSA CLOVER

FARM TYPE

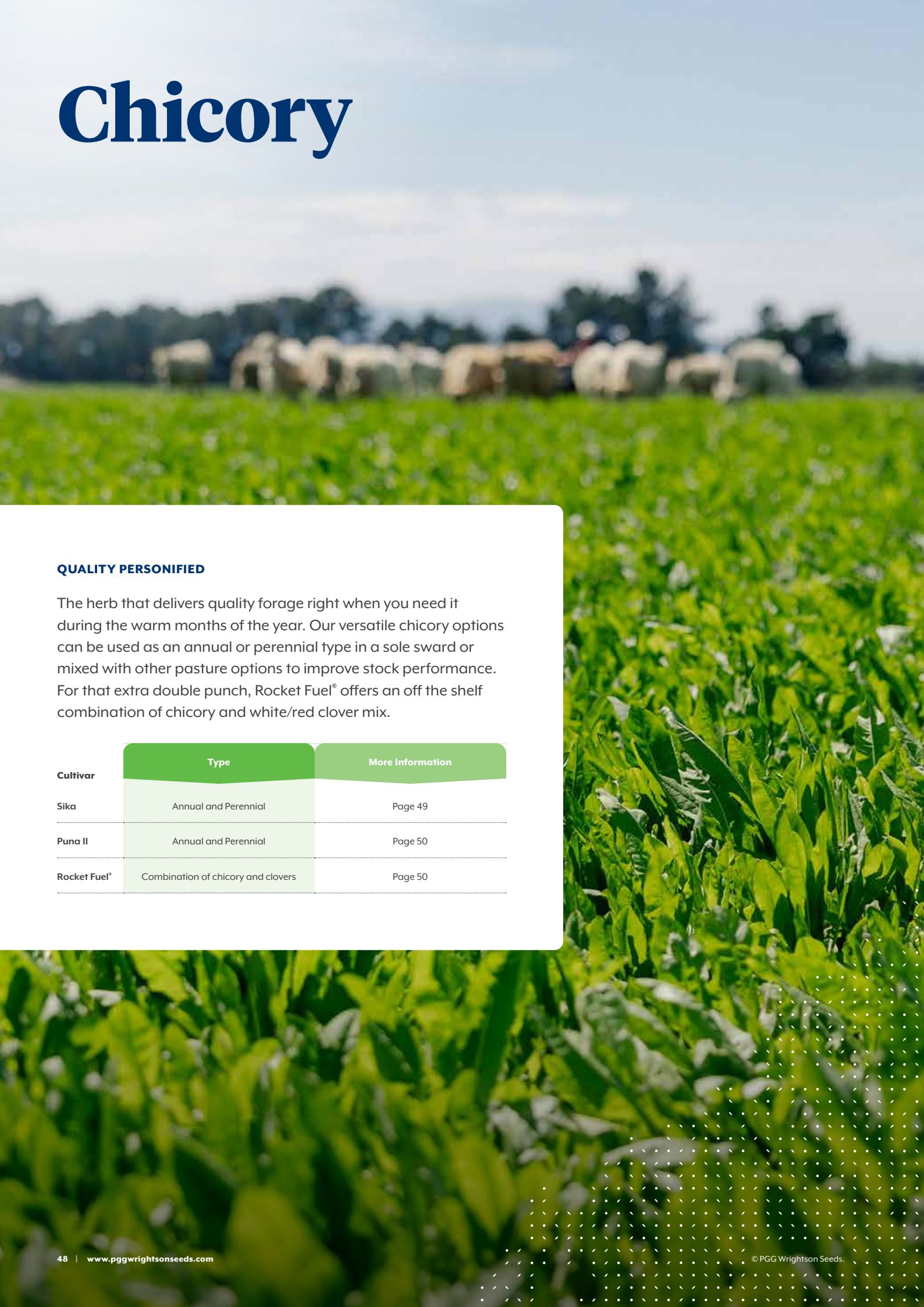
SOWING RATE
STANDARD **4-6 kg/ha**
Superstrike® or Prillcote® Taipan

Taipan is a mid-maturing balansa clover with high levels of hard seed, allowing for flexibility when seasons are dry. Taipan can perform in various soil types and can grow in areas of medium rainfall with excellent waterlogging tolerance. With high dry matter production, Taipan can be grown for quality hay or as part of a perennial pasture system.

- Mid-season annual clover providing early spring feed
- Excellent production - Increased winter/early spring production compared to sub clover cultivars
- Good adaptability across a wide range of soil types and pH levels
- Ability to tolerate waterlogged soils
- Suited to pasture mixes with Winter Star II, Feast® II, Lush AR37 and Supercruise ryegrasses

Scan to learn more about Taipan

Chicory



QUALITY PERSONIFIED

The herb that delivers quality forage right when you need it during the warm months of the year. Our versatile chicory options can be used as an annual or perennial type in a sole sward or mixed with other pasture options to improve stock performance. For that extra double punch, Rocket Fuel® offers an off the shelf combination of chicory and white/red clover mix.

Cultivar	Type	More Information
Sika	Annual and Perennial	Page 49
Puna II	Annual and Perennial	Page 50
Rocket Fuel®	Combination of chicory and clovers	Page 50

The multi system fit chicory

GRASSLANDS® Sika CHICORY NEW

Scan to learn more about Sika

FARM TYPE

SOWING RATE PURE STAND **8 kg/ha** IN MIXTURE WITH CLOVER **4-6 kg/ha**

STANDARD PASTURE MIX **1-2 kg/ha**

Sika is a New Zealand bred chicory, that has been developed to meet the variety of farm systems this forage is now used in, such as a short-term summer fed crop, a multi-year specialist crop with or without clover and as a component of pasture mixes.

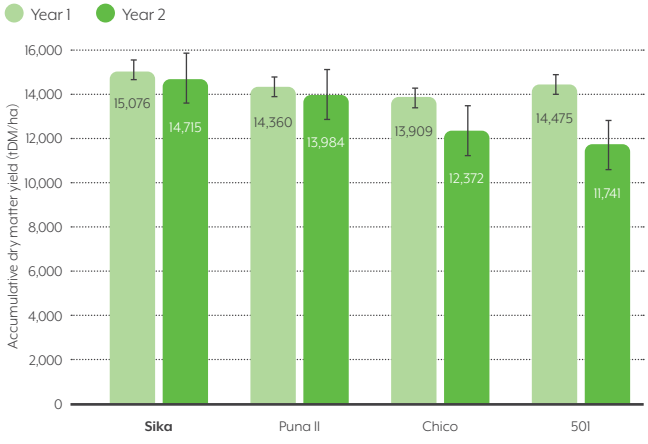
Sika is a true perennial chicory with its parentage selected from plants collected out of long-term grazing trials at Ruakura, Hamilton. A core focus in the development programme was improved adaptability and performance over its predecessor Puna II chicory. Characterised by rapid establishment, strong seasonal production and improved disease tolerance and persistence Sika can be used as an annual crop, or as part of a perennial, multi-year sward.

Chicory is well recognised for its high nutritional feed quality, and users of Sika can expect increased yield and disease tolerance relative to Puna II and other commercially available cultivars.

Versatile, high yielding chicory used as both annual and perennial sward situations.

- Rapid establishment and high annual production
- Versatile option suitable as an annual crop or true perennial
- Exceptional persistence under grazing
- NZ bred with strong disease tolerance
- Strong cool season activity and outstanding second year production
- Semi-erect for better crop utilisation by grazing animals
- Thick, deep taproot offering drought tolerance

Two year average dry matter production (kg DM/ha) of chicory cultivars, Lincoln and Palmerston North (2021-23).



Combined averages from 2 trials in Palmerston North and Lincoln (2021-2023). Duncan lettering is used to indicate statistical differences. Year 1 = 1st October to 31st July. Year 2 = 1st August to 1st March.

The palatable, persistent herb

GRASSLANDS **Puna II** CHICORY

FARM TYPE

SOWING RATE PURE STAND **8 kg/ha**
STANDARD PASTURE MIX **1-2 kg/ha**

Puna II chicory is a high-yielding forage with good nutritional value for grazing animals. It is a high quality feed for spring to late autumn. Puna II is a New Zealand bred, broad-leaved, perennial forage herb with a true perennial chicory parentage. With semi-erect growth Puna II is easy for your stock to harvest meaning more meat, milk or wool for you.

Grasslands Puna II chicory is the palatable persistent perennial chicory for you

- A true perennial chicory that lasts longer than one year
- Thick, deep taproot offering drought tolerance
- Multi-graze option that recovers quickly after grazing
- Strong persistence
- Tolerant to *sclerotinia*
- Excellent first year production
- Semi-erect for better crop utilisation by grazing animals

Scan to learn more about Puna II

Fuel your farm

Rocket Fuel® CHICORY AND CLOVER MIX

FARM TYPE

SOWING RATE **13 kg/ha**
1 bag per hectare

Puna II CHICORY | Quartz MEDIUM LEAF WHITE CLOVER | Legacy LARGE LEAF WHITE CLOVER | Relish Red Clover

= **13 kg/ha** 1 bag per hectare

Rocket Fuel® – a customised versatile PGG Wrightson Seeds blend to fuel your animals. A combination of chicory, white clover and red clover with excellent animal performance potential. A high proportion of clover assists with the supply of nitrogen into the soil profile, promoting the growth of chicory to provide a dense cover to discourage weeds, including volunteer grass. The red clover component, alongside chicory, will provide high quality feed through a dry season, helping to reduce risk in summer dry areas.

- Highly palatable
- Excellent feed for high liveweight gains
- Provides high quality feed through summer
- High protein option for dairy farmers
- Recovers quickly after grazing
- High mineral content, particularly zinc, potassium and copper

**While stocks last. Components of the mix may change subject to availability.*

Scan to learn more about Rocket Fuel

Lucerne

LONG-LIVED, QUALITY FORAGE

A deep-rooted legume, that can be used as a long term lucerne paddock or mixes with other complementary pasture options. PGG Wrightson Seeds offer two semi-dormant, persistent lucerne options for New Zealand farming systems, Stamina™ 5 and Kaituna that can be used for both grazing and cutting.

Cultivar	Dormancy rating 1 = full, 9 = none	Uses	More Information
Stamina™ 5	5	Grazing and cutting	Page 52
Kaituna	5	Grazing and cutting	Page 52

CHELSEA ALABASTER, EASTERN NORTH ISLAND AREA SALES AGRONOMIST, INSPECTING KAITUNA LUCERNE IN THE HAWKE'S BAY.

Stamina to go the distance

Stamina™ 5 LUCERNE

FARM TYPE

SOWING RATE
BARE SEED **8-10 kg/ha**
SUPERSTRIKE® TREATED SEED **10-14 kg/ha**

Stamina™ 5 is a grazing-tolerant, semi winter dormant (5) lucerne with excellent yield and forage quality in dryland conditions. High grazing tolerance makes Stamina 5 an ideal choice for grazing systems while offering flexibility in silage stands that are occasionally grazed.

- Grazing-tolerant lucerne that is semi winter dormant
- Highly productive in both grazing and hay/silage systems
- Strong persistence under grazing
- Tolerates periods of set stocking and close grazing
- Produces excellent quality hay
- Good overall resistance to most lucerne diseases

Scan to learn more about Stamina™ 5

Versatility when it's needed

GRASSLANDS Kaituna LUCERNE

FARM TYPE

SOWING RATE
BARE SEED **8-10 kg/ha**
SUPERSTRIKE® TREATED SEED **10-14 kg/ha**

Grasslands Kaituna lucerne is a New Zealand developed lucerne selected for improved resistance to the range of insect pests and diseases. It is ideal for grazing and mixed regimes and is persistent under grazing and hay/silage production. Kaituna lucerne is highly productive in spring and summer, with later autumn and earlier spring growth than Wairau.

- Fine stemmed for better quality and palatability
- Semi-dormant in winter
- Versatile – persistent under grazing, hay/silage and mixed regimes
- High annual dry matter production
- Excellent pest and disease resistance

Scan to learn more about Kaituna

Brassica Options

THE GO TO FOR FILLING THE FEED GAP

PGG Wrightson Seeds is a world leader in delivering a diverse product range of forage brassicas used across New Zealand farm systems, including the Cleancrop™ Brassica range and Pallaton Raphno® brassica. The following brassica section covers the product range available, whilst providing valuable information on the benefits of forage brassicas, along with agronomic and feed management advice.

RICHARD GOLDIE, CENTRAL SOUTH ISLAND AREA SALES AGRONOMIST, INSPECTING CLEANCROP™ ASPIRING.

Why brassicas and what makes ours the best

WHY SOW BRASSICAS?

Brassica forage crops provide farmers with a large amount of high quality feed (high in energy and protein) for their stock and should be considered in any situation where pasture quantity or quality is limiting the potential of livestock.

WHEN TO USE BRASSICAS

- During periods of feed shortage through the summer, autumn and winter
- To supplement periods of low pasture quality
- To finish stock
- When a summer-safe feed is required
- Prior to pasture renewal

FACT FILE:

Brassicas provide a bulk amount of high quality feed to maximise growth rates and increase the number of stock finished or maintained per hectare.

A brassica crop provides a break from pasture, decreasing pest levels, eliminating weed problems and with fertiliser helps correct soil fertility problems, resulting in cleaner, higher-producing pasture.

Using brassicas helps avoid internal parasites and pathogens that cause animal health problems, such as ryegrass staggers.

Brassica crops can increase stock productivity and therefore increase farm profitability.

WHY CHOOSE PGG WRIGHTSON SEEDS BRASSICAS?

- We are New Zealand's market-leading supplier of brassica seed
- Our joint forage brassica breeding programme (Forage Innovations Ltd) combines our expertise with Plant and Food Research (NZ)
- We deliver a range of class-leading brassicas

We are committed to providing forage crop seed that not only produces high quantities of feed, but also leads to improved animal performance through feed quality, thereby providing positive benefits to the New Zealand farmer.

THE IMPORTANCE OF QUANTITY AND QUALITY OF FORAGE BRASSICAS

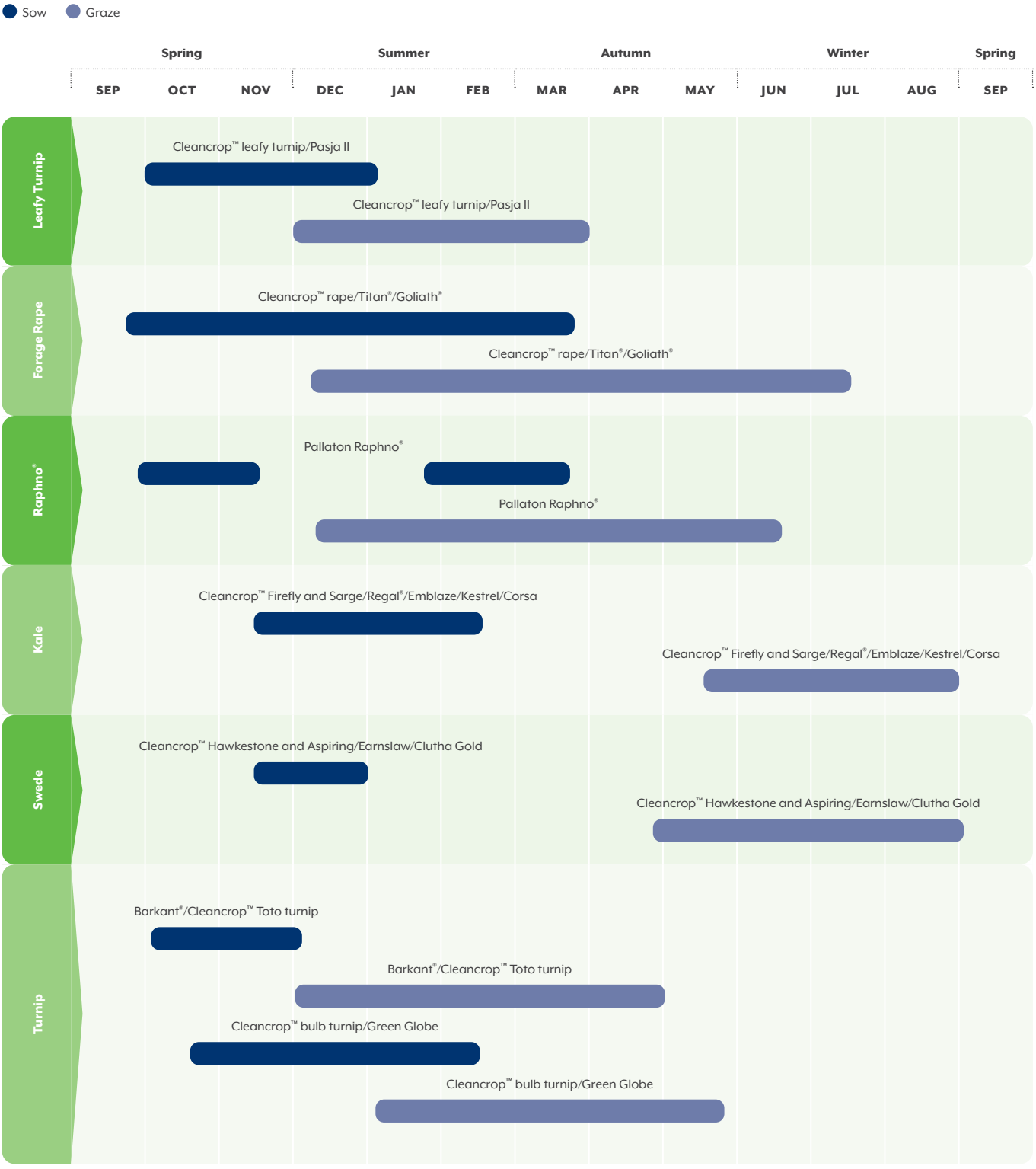
Yield assessment and dry matter testing

Allocating the right quantity of feed is essential for achieving target animal performance. Underfeeding is the major cause of animals failing to perform well on brassica crops.

A correct yield and dry matter percentage assessment in combination with correct break size or allocation is critical when feeding brassica crops. Yield cuts provide an assessment of the amount of fresh weight of the crop in the paddock.

ANDY DUMBLETON, HEAD OF BREEDING - BRASSICA AND CROPS, INSPECTING SARGE KALE.

Brassica growing and grazing guide



Check with your seed retailer for the best time to sow and graze crops in your area.

**Make sure soil temperatures are around 10°C and rising before sowing.*

Planning for grazing brassica crops

PRESOWING

- Choose paddocks well away from waterways; maintain pasture buffer strips between crop and critical source areas as required by your local regional council
- Plan sustainable crop rotations, minimising risk of build up of soil-borne plant diseases
- Use conservation tillage techniques, slow runoff and reduce downhill slope loss
- Direct drill first year crops
- Soil test to identify nutrient levels and define fertiliser requirements

FEED PLANNING AND PADDOCK SET UP

- Feed budget planning is needed well before crops are grazed
- Place baleage on crop paddocks before winter, away from critical source areas
- Check stock water supplies; portable troughs that follow the crop face work well
- Match crop type with stock class (e.g. calves and hoggets need crops that contain more protein); young animals may do less well on bulb crops
- Match supplement type with stock class. Cereal straws are unsuitable for young stock classes if fed as the only supplement type offered alongside brassica crops
- Plan for adverse weather events; allow for nearby standoff areas with extra supplements and good shelter from wind

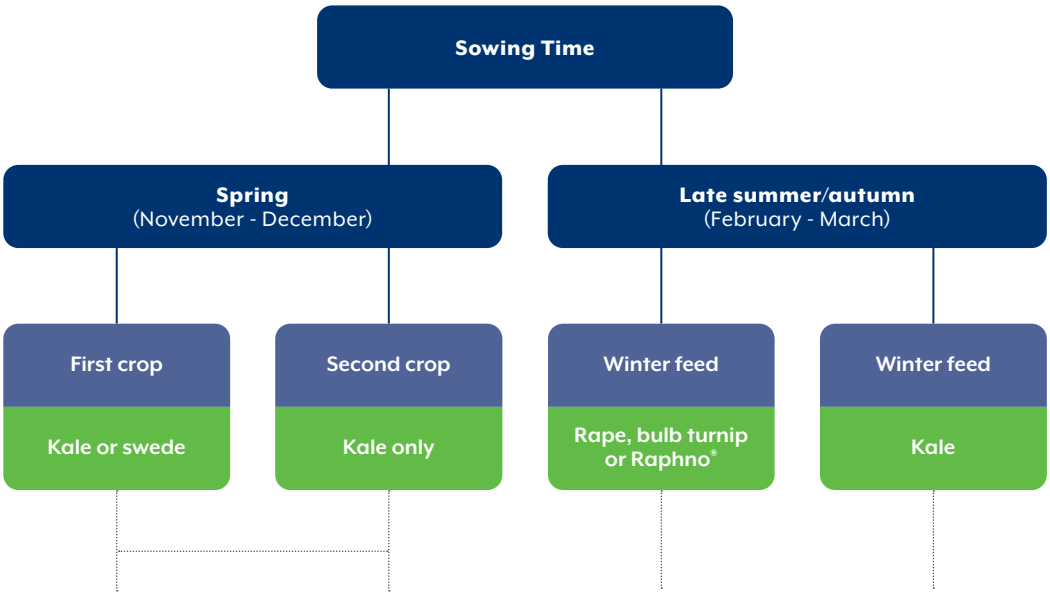
GRAZING MANAGEMENT

- Utilisation of crop and equal access to crop by all animals is best achieved when long, narrow breaks are offered rather than short, wide breaks
- Move the break fence at least once or twice daily to reduce trampling and crop wastage
- Minimise breakout risk with hot fencing standards and sufficient voltage
- Double fence the crop break to stop access to full crop area if breakouts occur
- Graze downhill towards critical source areas
- Offer extra crop area and more high fibre supplementary feed when cold weather is forecast
- Back fencing planning – as required by your local regional council

WAYNE NICHOL AND ANDY DUMBLETON INSPECT TRIAL PLOTS AT PGG WRIGHTSON SEEDS' KIMIHIA RESEARCH CENTRE.

Brassica selection guide

WINTER FED BRASSICA OPTIONS:



SWEDE

GRAZE FROM 150-170 DAS

Well-suited to both sheep, cattle and deer wintering systems. Good option for farms with snow risk that could cause kale to lodge.

- Aspiring
- Hawkestone
- Earnslaw
- Clutha Gold

KALE

GRAZE FROM 150 DAS

Good option for cattle and deer wintering systems. Shorter kale cultivars (e.g. Kestrel) also suitable for sheep wintering systems.

- Firefly
- Sarge
- Regal
- Corsa
- Kestrel
- Emblaze

RAPE OR BULB TURNIP

GRAZE FROM APPROX. 100-120 DAS

Sow earlier for higher yielding crops.

- pallaton RAPHNO®
- Rape
- Bulb Turnip
- Goliath
- Green Globe

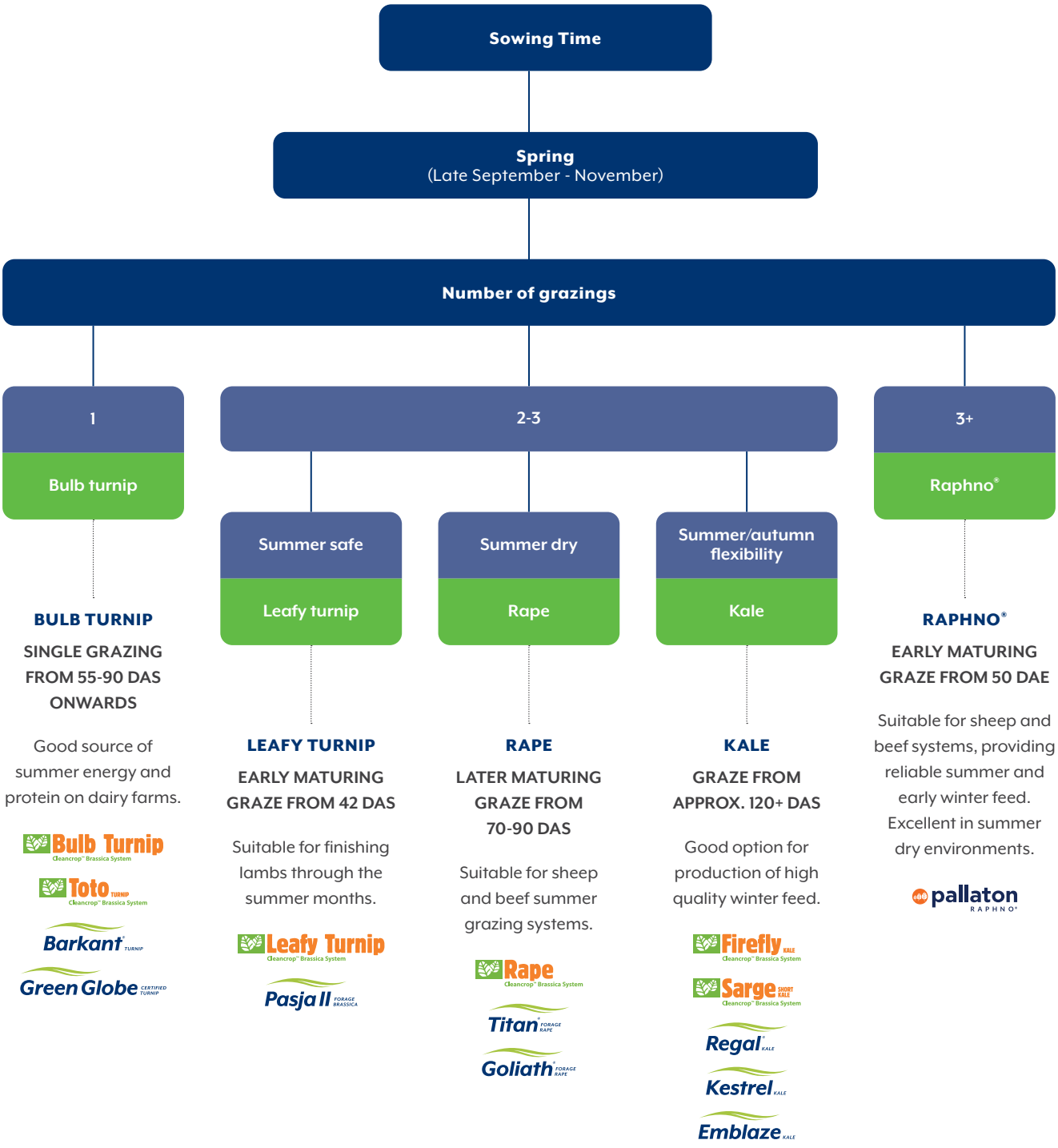
KALE

GRAZE FROM APPROX. 100-120 DAS

Sow earlier for production of high quality winter feed.

- Firefly
- Sarge
- Regal
- Corsa
- Kestrel
- Emblaze

SUMMER FED BRASSICA OPTIONS:



BULB TURNIP

SINGLE GRAZING FROM 55-90 DAS ONWARDS

Good source of summer energy and protein on dairy farms.

Bulb Turnip
Toto
Barkant
Green Globe

LEAFY TURNIP

EARLY MATURING GRAZE FROM 42 DAS

Suitable for finishing lambs through the summer months.

Leafy Turnip
Pasja II

RAPE

LATER MATURING GRAZE FROM 70-90 DAS

Suitable for sheep and beef summer grazing systems.

Rape
Titan
Goliath

KALE

GRAZE FROM APPROX. 120+ DAS

Good option for production of high quality winter feed.

Firefly
Sarge
Regal
Kestrel
Emblaze

RAPHNO®

EARLY MATURING GRAZE FROM 50 DAE

Suitable for sheep and beef systems, providing reliable summer and early winter feed. Excellent in summer dry environments.

pallaton RAPHNO®

DAS: days after sowing DAE: days after emergence

Multi graze options can be grazed from summer through to the end of winter.

Transitioning livestock onto brassica crops

DRYSTOCK TRANSITIONING TO BRASSICAS

The first two weeks:

- A full rumen is required before animals are shifted onto crops - especially cattle. Fill up with pasture and/or baleage, silage, hay and/or straw
- Remove animals from crop after 1-2 hours during the first few days and return to pasture
- Ensure plenty of long-stem fibre supplements (baleage, silage, hay and/or straw) are available to stock when off crop
- During transitioning, increase feed allocation of brassica crops in small 15-20% increments every two days, building up to a maximum allowance over at least 10-14 days
- Once feed transition is complete, offer no more than 80% of the diet as crop for drystock
- Feed at least 20% of the diet as good quality fibrous supplement or runoff pasture for non-lactating dairy cattle, beef cattle and sheep. Runoff pasture may not provide adequate fibre intake for cattle, therefore it is recommended that a quality fibre supplement is offered
- Sheep and deer ideally need access to long-stem fibre at 10-20% of the diet once fully transitioned to crop
- The first 14 days while transitioning onto brassica crops is when most animal health challenges occur

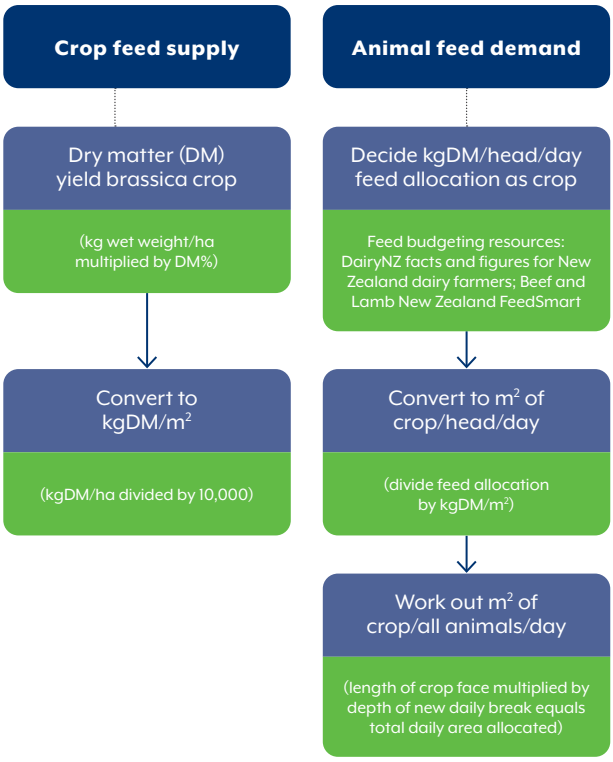
LACTATING DAIRY COWS TRANSITIONING TO BRASSICAS

The first two weeks:

- A full rumen is required before lactating dairy cows are shifted onto crops. Fill up with pasture and/or baleage, silage, hay and/or straw after milking. Once all cows have consumed pasture/supplements THEN start cows onto brassica crop
- Start by grazing the crop for no more than 1-2 hours per day during the first few days, returning cows to a diet of pasture plus high fibre supplementary feeds
- During the transitioning period, ensure plenty of long-stem fibre supplements (baleage, silage, hay and/or straw) are available to cows when off crop
- Pasture plus brassica crop is a suitable complete diet for cows once fully transitioned onto brassica. Feed extra supplementary fibre during the transition period
- During transitioning, increase feed allocation of brassica crops in small 15-20% increments every two days, building up to a maximum allowance over at least 10-14 days
- Once feed transition is complete, offer no more than 35% of the diet as crop for lactating cows, due to risk of brassica milk taint

Clean, fresh stock water must be available for brassica-fed animals at ALL times.

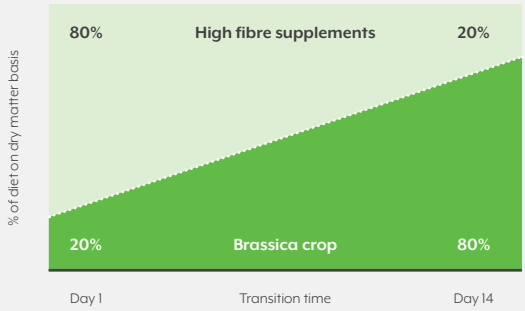
CROP AREA ALLOCATION



KEY RISKS OF TRANSITIONING ONTO BRASSICAS

The first 14 days on brassica crops is when most animal health challenges occur.

Transitioning = gradual increase in percentage of brassica crop in the diet.



Once fully transitioned onto brassica crop, livestock should continue to receive at least 20% of the diet as high fibre supplements.

NOTE: Feed no more than 35% of the diet on a dry matter basis as brassica crop for lactating dairy cows, due to risk of brassica milk taint.

Cleancrop™ Brassica System

THE CLEANCROP™ BRASSICA SYSTEM IS A CROP AND WEED MANAGEMENT SOLUTION ALL IN ONE.

Only Cleancrop™ combines the power of broad-spectrum herbicide Telar® and plants bred to resist it. Telar® takes care of 23 hard to-control weeds at the time of sowing, freeing up moisture and nutrients to give your crop the best chance of maximising performance and delivering superior returns on your seed investment. This section outlines the Cleancrop™ brassica range, explaining its benefits and providing guidance on how to use it effectively in your farming system.

Control weeds. Increase yield.

CLEANCROP™ BENEFITS

- **Control weeds** within 48 hours of sowing*
- **No moisture required#** to activate Telar® herbicide
- **No soil incorporation required**
- **Adaptable to method of sowing**

cleancrop® Brassica System

The Cleancrop™ Brassica System (seed + herbicide) package enables you to control your weeds at the time of sowing.

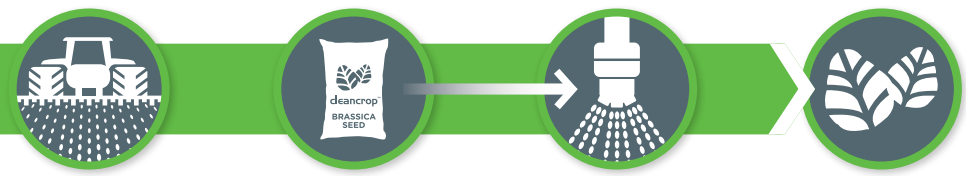
Cleancrop™ brassica seed

Cultivars that have been BRED to be tolerant to the sulfonylurea herbicide Telar®

Telar® herbicide

A broad spectrum herbicide that provides EXCELLENT control of broadleaf weeds from the pre emerge stage

HOW DOES IT WORK?



Prepare paddock | Plant Cleancrop™ | Spray with Telar®

*For the weeds listed on page 63 that require Telar® applied as a foliar spray at post-emergence, an application can be made when the crop is at the fourth true leaf stage or later.
#When applied pre-emerge Telar® is taken up through the roots of weeds when conditions promote their growth.

WHY USE CLEANCROP™?

A simple weed management solution. No other forage brassica system combines the power of traditionally bred herbicide tolerant plants plus a broad-spectrum herbicide that will **maximise crop performance**.

SIMPLE PLANNING

Give your crop a head start
Weeds are controlled right from the start

All in one pack
Receive the exact amount of seed and chemicals for the job

MAXIMISE PERFORMANCE

Reduce competition
for moisture and nutrients

Manage
historically difficult to control weeds

Increase performance
Excellent agronomic cultivars

ON-GOING BENEFITS

Maximise yield = Low c/kgDM

Short plant back
Only 3 month grass and clover plant back period

Cleaner new pasture paddocks

TELAR® HERBICIDE CONTROLS THE FOLLOWING 23 WEEDS:

- Calandrinia
- Californian Thistle*
- Chickweed
- Cornbind
- Dandelions
- Docks
- Fathen
- Hawksbeard
- Nodding Thistle
- Rayless Chamomile
- Redroot
- Scarlet Pimpernel
- Scentless Chamomile
- Scotch Thistle
- Shepherd's Purse
- Spurrey (Yarr)
- Stinking Mayweed
- Twin Cress
- Vetch
- White Clover
- Wild Turnip*
- Willow Weed
- Yellow Gromwell

Post emergent weed control

Best results are obtained when Telar® is applied to young, actively growing weeds (less than 5 cm tall or across).

Warm, moist conditions following treatment promote the activity of Telar® while cold, dry conditions delay the activity of Telar®.

Apply Telar® post-emerge when Cleancrop™ brassicas are at the fourth leaf stage. Consult your accredited Agent/Retailer to order your second Telar® spray.

Cleancrop™ Packages

Scan to learn more about Cleancrop™

The Cleancrop™ Brassica System is available in eight cultivars to suit all farm types and stock classes. All Cleancrop™ cultivars are ordered on a per hectare (ha) basis and includes 20 g/ha Telar®.

FURTHER INFO: Refer to the Cleancrop™ Brassica System Guide for more information.

Cultivar	Sowing rate	Spring SEP	Spring OCT	Spring NOV	Summer DEC	Summer JAN	Summer FEB	Autumn MAR	Autumn APR	Autumn MAY	Winter JUN	Winter JUL	Winter AUG
Leafy turnip	4 kg/ha		Sow		Graze								
Forage rape	4 kg/ha		Sow		Graze								
Bulb turnip (summer)	2 kg/ha		Sow		Graze								
Bulb turnip (winter)	1 kg/ha		Sow		Graze								
Toto turnip	2 kg/ha		Sow		Graze								
Aspiring swede	1 kg/ha			Sow					Graze				
Aspiring swede (pelleted)	90,000 seeds/ha			Sow					Graze				
Hawkestone swede	1 kg/ha			Sow						Graze			
Hawkestone swede (pelleted)	90,000 seeds/ha			Sow						Graze			
Firefly kale (intermediate)	4 kg/ha			Sow					Graze				
Sarge kale (short)	4 kg/ha			Sow					Graze				

Note: The Cleancrop™ Brassica System is unique. PGG Wrightson Seeds sell it as a package, i.e. Seed + Chemical. One item cannot be purchased without the other. Agents/Retailers have to be accredited to sell the Cleancrop™ Brassica System to ensure stewardship is maintained.

Science, seeds and solutions

CHECK OUT THESE NEW PRODUCTS!

Sarge SHORT KALE NEW
Cleancrop™ Brassica System

See page 67 or scan to learn more about Sarge

Aspiring SOFT SWEDE NEW
Cleancrop™ Brassica System

See page 70 or scan to learn more about Aspiring

Emblaze KALE NEW

See page 81 or scan to learn more about Emblaze

Who says you can't have quantity and quality?

Firefly KALE
Cleancrop™ Brassica System

Scan to learn more about Firefly

FARM TYPE

DAYS TO GRAZING LATE NOVEMBER ONWARDS SOWING **150-220 days**
LATE OCTOBER SOWING **100-140 days** till first light grazing

SOWING RATE **4 kg/ha**

Firefly kale is a high yielding, intermediate-height kale with a high leaf-to-stem ratio. Excellent crop utilisation by animals due to single plant selection for soft stems during the plant breeding process. Firefly is the first kale cultivar available in the Cleancrop™ Brassica System bred to have a herbicide resistance trait, which allows the application of Telar® herbicide at both pre- and post-emergence for excellent weed control.

- High yielding, intermediate-height kale
- High leaf-to-stem ratio with very good late winter leaf percentage
- Excellent crop utilisation due to selection for soft stems
- Very good winter hardiness and excellent pest and disease tolerance

Agronomic performance of Regal® kale relative to Cleancrop™ Firefly kale

Cultivar	Leaf %	Hundredised total yield	Maturity (DAS)
Cleancrop™ Firefly	33	100	150-220
Regal®	32	101	150-220

4 trials: Gore, Hinds, Kimihia and Palmerston North (2015). In these trials conventional herbicides were used on all cultivars. Telar® was not applied. Where Telar® was used for Firefly and no herbicide applied to the other cultivars, we would expect higher yields for Firefly kale.

The soft-stem advantage

Sarge SHORT KALE

NEW

Cleancrop™ Brassica System

Scan to learn more about Sarge

FARM TYPE

DAYS TO GRAZING LATE NOVEMBER ONWARDS SOWING **150-220 days**
LATE OCTOBER SOWING **100-140 days** till first light grazing

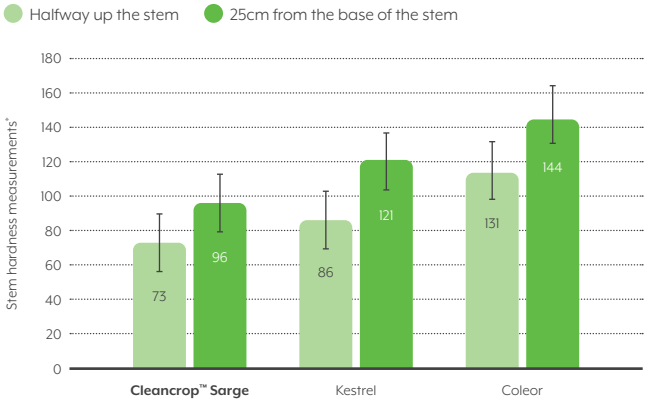
SOWING RATE **4 kg/ha**

NEW ZEALAND BRED

Sarge is a short to medium type kale, which offers an alternative to Kestrel kale when a high degree of weed control is required via the Cleancrop™ system. Sarge has a high leaf-to-stem ratio and is soft stemmed which leads to improved crop utilisation.
Due to its stem softness and later flowering, Sarge can be sown to supplement diets of grazing animals not only in winter but can be utilised as an alternative late autumn forage and if lightly grazed can regrow for winter feed. The second kale to be part of the Cleancrop™ Brassica System, Sarge has been bred with a herbicide resistant trait which allows the application of Telar® herbicide at both pre and post-emergence for excellent weed control.

- High yielding, short to medium height kale
- Excellent stem softness to promote crop utilisation and good stem quality to enhance animal performance
- Large paddle shaped leaves provide exceptional leaf yields and a very high leaf to stem ratio
- Versatility to be used as an autumn forage
- Very good winter hardiness, and late winter leaf percentage
- Late flowering to increase the period of feeding late winter
- First and second crop option

Stem hardness of kale cultivars plant and food research, Lincoln 2020.



Giant-type kale (left) compared to Sarge (right) showing significantly less lignin

Lower value = softer stems

Average stem hardness measured by Instron 1140 tensile tester in Lincoln, Canterbury 2020
Differences between cultivars must exceed the LSD (5%) to be statistically different. '25cm from base of stem' LSD 5% = 34.0. 'Halfway up stem' LSD 5% = 34.4.

ETHAN BUTCHER, LOWER SOUTH ISLAND FORAGE SYSTEMS SPECIALIST, SHIFTING A BREAK ON HIS HOME FARM.

The swede taste of success

Hawkestone SWEDE

Cleancrop™ Brassica System

Scan to learn more about Hawkestone

FARM TYPE

DAYS TO GRAZING 170-250 days

SOWING RATE CONVENTIONAL SOWING **1 kg/ha**
PELLETED **90,000 seeds/ha**

Hawkestone swede is a high yielding, yellow-fleshed, main crop swede with medium maturity. Along with a similar dry rot and clubroot tolerance to Aparima Gold swede, it also has a good tolerance to powdery mildew. With the added benefit of the Cleancrop™ Brassica System, Hawkestone swede is resistant to Telar® herbicide application at both pre- and post-emergence for excellent weed control.

It is the first swede cultivar to be single plant selected for lower levels of grazing anti-nutritional glucosinolate compounds (progoitrin, glucobrassicin and neoglucobrassicin levels similar to Aparima Gold Swede).

- High yielding, yellow-fleshed swede with medium maturity
- Similar dry rot and clubroot tolerance to Aparima Gold
- Good leaf disease tolerance
- Plant glucosinolate levels similar to Aparima Gold swede

Agronomic performance of swede cultivars relative to Cleancrop™ Hawkestone swede

Cultivar	Hundredised bulb yield	Hundredised leaf yield	Leaf %	Hundredised total yield	Maturity (DAS)
Cleancrop™ Hawkestone	100	100	24	100	170-220
Aparima Gold	89	118	28	96	170-220
Clutha Gold	104	115	26	106	170-220
Invitation	70	121	35	82	170-220

7 trials: Methven (2013, 2014, 2015), Gore (2013, 2014, 2015) and Palmerston North (2015). In these trials conventional herbicides were used on all cultivars. Telar® was not applied. Where Telar® was used for Hawkestone and no herbicide applied to the other cultivars, we would expect higher yields for Hawkestone swede.

RICHARD GOLDIE, CENTRAL SOUTH ISLAND AREA SALES AGRONOMIST, INSPECTING CLEANCROP™ ASPIRING.

An early maturing, soft bulbed swede

Aspiring SOFT SWEDE

NEW

Cleancrop™ Brassica System

Scan to learn more about Aspiring

FARM TYPE

DAYS TO GRAZING 150-220 days

SOWING RATE CONVENTIONAL SOWING/DIRECT DRILLING **0.8-1.5 kg/ha**
PELLETED **90,000 seeds/ha**

NEW ZEALAND BRED

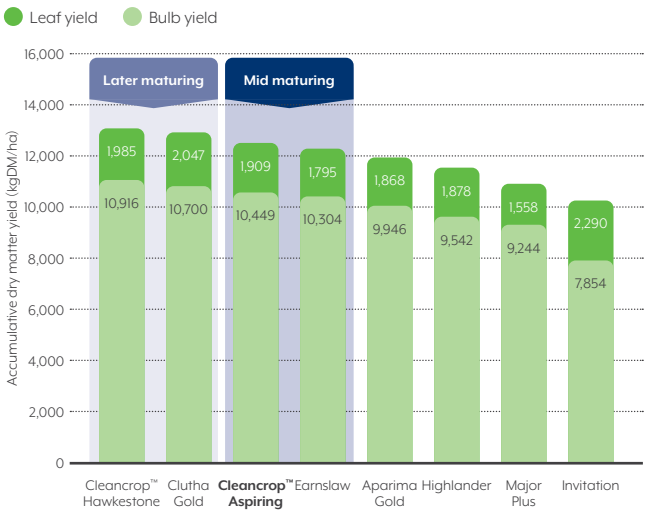
Cleancrop™ Aspiring swede, is a soft, early maturing, yellow-fleshed swede, offering a Cleancrop™ swede option for those farmers that prefer the bulb softness traditionally seen in Major Plus and more recently Earnslaw swede.

Relative to Major Plus, Cleancrop™ Aspiring swede offers improved dry-rot and *Alternaria* tolerance, with the ability to control weeds through adoption of the Cleancrop™ Brassica System. The combination of soft bulb and greater disease tolerance makes Cleancrop™ Aspiring an option for all stock classes including younger stock when swedes are being used.

- Early maturing, main crop swede
- Soft bulb relative to later maturing swedes
- Ability to control weeds included in the Cleancrop™ Brassica System
- Improved disease resistance to dry-rot and *Alternaria* compared to Major Plus
- Improved leaf and bulb yield over Major Plus
- Yellow-fleshed, light, purple-skinned bulb
- Pelleted seed available

Average yield (kg DM/ha) of swede cultivars for both leaf and bulb

This trial data is in the absence of Telar®



Multi-site analysis of 8 trials (Methven and Gore 2019/20, 2020/21, 2021/22, 2022/23). LSD(0.05) Leaf yield 483 kg DM/ha and Stem yield 1459 kg DM/ha

Ultrastrike® pelleted swede seed

Ultrastrike®
pelleted brassica

With a weighted build-up coating (pellet), Ultrastrike® pelleted swede seed can be sown using precision drills. Yield is maximised through the even distribution of seed, sown at the correct rate and depth, that allows bulbs to grow more consistently and be protected from sun exposure or being eaten by birds or pests. Pelletised swede seed now includes phosphate in the seed pellet to aid in establishment and growth.

Ultrastrike® pelleted swede has an optimum sowing rate of 90,000 seeds/ha or 22 cm seed spacing in 50 cm rows.
The size specification for pelleted swede seed is 3.25-4.00 mm.

KEY BENEFITS

- Maximum bulb yield through evenly distributed sowing
- Highly cost-effective outputs
- Easy to sow (one bucket/ha)
- Contains trace element molybdenum for enhanced growth

CULTIVARS AVAILABLE IN PELLETED FORM

Aspiring SOFT SWEDE
Cleancrop™ Brassica System

Hawkestone SWEDE
Cleancrop™ Brassica System

Earnslaw SWEDE

Clutha Gold SWEDE

ULTRASTRIKE® PELLETISED SWEDE

From its very beginnings, Ethan Butcher, our Forage System Specialist based in Hedgehope, Southland, has had a unique history with Ultrastrike® pelletised swede. Being integral in developing the concept, through to testing and its commercial launch, Ethan has so much confidence in its value that he now utilises the technology on his own farm. “Precision drilling using a combination of new swede cultivars such as Cleancrop™ Aspiring and Earnslaw swede with Ultrastrike® pelletised seed is the way forward for my swede crops. The increase in yield helps take the stress out of getting winter crops established and hitting yield targets. Plus the increased bulb size, swede softness and utilisation associated with the technology and the new cultivars have meant I get well fed and happier stock.”

Fast feed for summer and autumn

Toto TURNIP

Cleancrop™ Brassica System

FARM TYPE

DAYS TO GRAZING 55-90 days

SOWING RATE 2 kg/ha

Toto turnip is a high yielding, summer and autumn bulb turnip with early maturity, allowing it to be grazed from 55 days after sowing. A tankard bulb shape alongside great bulb softness promotes excellent crop utilisation by grazing animals. Toto is also part of the Cleancrop™ Brassica System with the added benefit of a herbicide resistance trait, which allows the application of Telar® herbicide at both pre- and post-emergence for excellent weed control.

- High yielding, summer bulb turnip
- Improved turnip mosaic virus tolerance
- Tankard bulb shape to increase crop utilisation
- Able to graze from 55 days after sowing (55-90 DAS)
- Suitable for summer and autumn feed

Scan to learn more about Toto

The all rounder

Bulb Turnip

Cleancrop™ Brassica System

FARM TYPE

DAYS TO GRAZING 80-110 days

SOWING RATE SUMMER 2 kg/ha WINTER 1 kg/ha

Cleancrop™ bulb turnip is a high yielding, globe bulb turnip with medium maturity suitable for sowing from late spring through to early summer to supply feed in summer, autumn and early winter months. The added benefit of the Cleancrop™ Brassica System is that plants are bred to resist Telar® herbicide, allowing application at both pre- and post-emergence for excellent weed control.

- High yielding bulb turnip
- Suitable for sowing from late spring through to late summer
- Suitable for summer/autumn/winter feed

Scan to learn more about Bulb Turnip

Outstanding; as simple as that

Reliable summer feed

Leafy Turnip

Cleancrop™ Brassica System

FARM TYPE

DAYS TO GRAZING 42-70 days **SOWING RATE** 4 kg/ha

Cleancrop™ leafy turnip is a fast establishing, multi-graze variety with reduced flower bolting and 25% more total yield from multiple grazings than Pasja II leafy turnip. As part of the Cleancrop™ Brassica System, it has the added benefit of a herbicide resistance trait allowing Telar® to be applied at both pre- and post-emergence for excellent weed control.

- High yielding - 25% higher than Pasja II
- Multi-graze Pasja type with reduced bolting
- Fast-establishing, high quality feed
- Excellent plant persistence after multiple grazings (moisture dependent)
- Provides a flexible grazing option for all stock classes over summer and autumn
- Minimal ripening required

Scan to learn more about Leafy Turnip

Rape

Cleancrop™ Brassica System

FARM TYPE

DAYS TO GRAZING 90-110 days **SOWING RATE** 4 kg/ha

Cleancrop™ rape is a high yielding, multi-graze forage rape with good leaf percentage and excellent crop ultilisation by animals. As part of the Cleancrop™ Brassica System, it has the added benefit of a herbicide resistance trait. Telar® herbicide can be applied at both pre- and post-emergence for excellent weed control, freeing up moisture and nutrients to give this multi-purpose forage rape the best chance of maximising summer, autumn and winter feed.

- High yielding, multi-graze rape with good leaf percentage and crop utilisation
- Multi-purpose forage rape with excellent summer/autumn/early winter feed
- Good regrowth potential with excellent winter keeping ability
- Similar Aphid tolerance as Goliath®
- A new generation rape and kale interspecies cross

Scan to learn more about Rape

The success of science

pallaton RAPHNO®

Scan to learn more about Pallaton

FARM TYPE **DAYS TO GRAZING** 50-70 DAE **SOWING RATE** 8 kg/ha

Pallaton Raphno® is a hybrid between *Brassica oleracea* (kale) and *Raphanus sativus* (radish). This hybrid has brought a number of impressive agronomic attributes into one cultivar, including high forage yield from multiple grazings, drought tolerance, clubroot tolerance and improved insect tolerance.

- **Persistent with excellent regrowth potential** – 100% increase in plant survival relative to forage rape under dryland sheep grazing management
- **High yielding** – 14% increased yield advantage relative to Goliath® forage rape in a multi-graze system (total cumulative dry matter yield from repeat harvests)
- **Drought tolerance** – 38% increase in water use efficiency relative to Goliath® forage rape
- **High clubroot tolerance** to Pukekohe, Hawke's Bay and Southland strains
- **Grazing flexibility** – Graze Pallaton as early as 50 days after emergence (DAE) to increase crop utilisation and optimise regrowth potential. It can be deferred up to 100 DAE, however crop utilisation, regrowth potential and feed quality will be reduced
- **Aphid tolerance** – 32% increase in Aphid tolerance relative to forage rape. Pallaton also has a higher level of tolerance to White Butterfly and Diamondback Moth

MORE MEAT PER HECTARE

Our trials showed Pallaton delivered 41%* more meat per hectare compared with chicory. **Pallaton Raphno®: total 390 kg/ha** versus **chicory: total 276 kg/ha.**

*Trial completed by PhD student Holly Phillips at Massey University. Meat per hectare data was captured over the period 17/01/2020 to 01/05/2020.

Pallaton performance: agronomic trials

GRAZING PALATABILITY

Pallaton has shown **increased palatability** relative to forage rape and leafy turnip brassicas. Lambs preferentially grazed Pallaton over the forage rape in Central Hawke's Bay. There was no fence between the strips of cultivars.

HIGH FORAGE YIELDS
FROM MULTIPLE GRAZINGS

Pallaton plots (dark green) amongst forage rape varieties in dryland North Canterbury.

DROUGHT TOLERANCE

DROUGHT TOLERANCE

38% increase in water use efficiency (WUE) relative to Goliath® forage rape

FLEXIBILITY

Graze Pallaton as early as 50 days after emergence (DAE) to maximise crop utilisation and optimise regrowth potential. It can be deferred up to 100 DAE, however crop utilisation, regrowth potential and feed quality will be reduced. Pallaton does not have a specific maturity requirement.

Refer to page 76 for grazing management.

GRAZING FLEXIBILITY

Post-grazing (left) and 15 days after rain (right).

PLANT PERSISTENCE
UNDER MULTIPLE GRAZINGS

PERSISTENCE UNDER MULTIPLE GRAZINGS

100% increase in plant survival relative to forage rape under dryland sheep grazing management.

Pallaton (left) and Forage rape (right) under clubroot pressure.

CLUBROOT TOLERANCE

CLUBROOT TOLERANCE

Pallaton Raphno® has a **high tolerance to clubroot**. In vitro inoculation pot trials and field trials to date have shown strong tolerance to Pukekohe, Hawke's Bay and Southland strains of clubroot. Although Pallaton is highly tolerant to clubroot it is still susceptible to other brassica diseases.

Forage rape (left) and Pallaton (right) under Aphid pressure. Both plants have had identical treatment and are in side-by-side plots.

APHID TOLERANCE

APHID TOLERANCE

32% increase in Aphid tolerance relative to forage rape. Pallaton also has a higher level of tolerance to White Butterfly and Diamondback Moth.

Pallaton grazing management

PALLATON RAPHNO® GRAZING INDICATOR FOR LAMBS

For the best opportunity to maximise feed quality, increase crop utilisation of lambs and optimise regrowth potential of Pallaton Raphno®, we recommend using the grazing indicator road cone to help with grazing management decisions.

1

PLANT, WAIT AND WATCH

Identify a position for your Pallaton cone in an average area of paddock. Think about what stock classes you have available.

2

GRAZE!

Once Pallaton reaches the reflective strip on the cone get in and graze.

Note: It must be at least 42 days since planting before grazing can commence.

3

YOU ARE MISSING OUT

Once Pallaton exceeds the height of the cone feed quality and regrowth potential will begin to decline.

AUTUMN PLANT COUNTS

The average plant numbers present in early autumn will help determine what the best option will be for your Pallaton crop.

MORE THAN 15 PLANTS/m²

Carry through for winter graze

Consider carrying the crop through to winter as a sole sward if weed burden is low and soil fertility is adequate. Shut the paddock up by early April and apply nitrogen accordingly to boost overall dry matter yield for winter.

10-15 PLANTS/m²

Undersow with winter-active grasses or cereals

Increase the opportunity for extra winter feed by undersowing with a winter-active ryegrass in the autumn. Options include Italian ryegrasses such as Supercruise, Lush AR37 and Feast® II, Winter Star II annual ryegrass or oats.

LESS THAN 10 PLANTS/m²

Spray out and resow

Plant numbers are inadequate to provide sufficient winter feed. Consider spraying out crop followed by a hard/ low residual graze with animals to minimise crop residue carryover before planting back into pasture.

FURTHER INFO: More info on Pallaton Raphno® can be found in the Pallaton Raphno® Guide.

Non Cleancrop Brassicas

PGG Wrightson Seeds has a large portfolio of conventional brassicas, which are a vital component of New Zealand forage systems, widely used for their ability to produce high-quality feed. These include species like kale, swedes, turnips and rape which have been bred over many years for yield, palatability and seasonal sustainability.

Conventional brassicas offer flexible grazing options for livestock, helping to maintain animal performance during the summer and winter months and also compliment our Cleancrop™ range of brassicas earlier in this guide. In this section you will find the following cultivars:

BRIAN YOUNG, SOUTHERN SOUTH ISLAND AREA SALES AGRONOMIST, WEIGHING CROPS.

Swede

Swedes are a spring sown, single graze option providing winter feed suited to cool, moist environments. Swedes can be divided into two categories: soft bulbed, early maturing cultivars (e.g. Earnslaw or Cleancrop™ Aspiring) or later maturing types (e.g. Clutha Gold or Cleancrop™ Hawkestone). Swedes are more susceptible to diseases including clubroot and dry rot, so should only be considered as a first year cropping option.

WHEN TO SOW? In environments where crops can be exposed to very cold conditions post-sowing, followed by increasing temperatures, swedes should be sown no earlier than 20 November. Earlier sowing combined with cold weather conditions can cause 'vernalisation' which means the plant believes it has been through winter and subsequently produces a seed head.

	High yield and early maturity	High yield and medium maturity	High yield, medium maturity and Telar® herbicide resistance	High yield, early maturity and Telar® herbicide resistance
	Earnslaw SWEDE	Clutha Gold SWEDE	Hawkestone SWEDE Cleancrop® Brassica System	Aspiring SOFT SWEDE Cleancrop® Brassica System
Potential yield (tDM/ha)	18	18	18	18
Days to grazing	150-220	170-250	170-250	150-220
Bulb softness	★★★	★★	★★	★★★
Flesh colour	Yellow	Yellow	Yellow	Yellow
Clubroot tolerance	★	★★	★★	N/A
Dry rot tolerance	★★	★★	★★	★★
Leaf keeping quality	★★	★★	★★	★★
More Information	Page 79	Page 79	Page 69	Page 70

KEY – = None | ★ = Moderate | ★★ = Good | ★★★ = Very good

Note: a difference of one ★ means that there is statistically significant difference.

The yield advantage

The next generation soft-bulb swede

Clutha Gold SWEDE

FARM TYPE		DAYS TO GRAZING	170-250 days
SOWING RATE	CONVENTIONAL SOWING/DIRECT DRILLING 0.8-1.5 kg/ha PELLETED 90,000 seeds/ha		

Clutha Gold is a swede bred from the Forage Innovations plant breeding joint venture between Plant and Food Research and PGG Wrightson Seeds and was developed to supersede Aparima Gold swede. Clutha Gold has a significant yield advantage over Aparima Gold while maintaining its disease tolerance to clubroot and dry rot. Clutha Gold also has an additional disease tolerance to the leaf disease, powdery mildew.

The golden opportunity for your business.
More yield. More profits

- Very high-yielding main crop swede
- New Zealand bred and tested
- Yellow-fleshed bulb with medium maturity
- Disease tolerance to clubroot, dry rot and powdery mildew
- Excellent winter keeping qualities
- Pelleted seed available, see page 71 for more information

Scan to learn more about Clutha Gold

Earnslaw SWEDE

FARM TYPE		DAYS TO GRAZING	150-220 days
SOWING RATE	CONVENTIONAL SOWING/DIRECT DRILLING 0.8-1.5 kg/ha PELLETED 90,000 seeds/ha		

Earnslaw is a traditional, yellow-fleshed swede that retains the same renowned characteristics of Major Plus, including early maturity and a soft bulb, but has the additional benefit of improved dry-rot and *Alternaria* tolerance. This results in higher yields and better winter keeping abilities. The combination of soft bulb and greater disease tolerance makes Earnslaw swede an ideal swede option for all stock classes including younger growing animals.

Earnslaw is the next generation early maturing swede, soft bulbed swede

- Early maturing main swede crop
- Soft bulb swede like Major Plus
- Disease tolerance to dry-rot and *Alternaria*
- Improved leaf and bulb yield over Major Plus
- Yellow-fleshed, light, purple-skinned bulb
- Pelleted seed available, see page 71 for more information

Scan to learn more about Earnslaw

Kale

Kale is generally a late spring/early summer sown, single graze option providing late autumn/winter feed from May to August. You can also sow mid spring for an earlier autumn feed. Selecting a kale cultivar is a balance between dry matter (DM) yield and forage quality determined by leaf percentage and stem softness.

Giant (tall) kale types provide bulk feed but lower forage quality and crop utilisation, while short types provide a lower DM yield and higher forage quality. Intermediate types offer a balance between DM yield and feed quality.

WHEN TO SOW? Spring/summer

	Exceptional quality	Exceptional quality with more leaf	Exceptional yield and good quality	Exceptional yield and more leaf	Exceptional yield and quality with Telar® herbicide resistance	Exceptional quality with Telar® herbicide resistance
	Kestrel KALE	Emblaze KALE	Regal® KALE	Corsa KALE	Firefly KALE Cleancrop™ Brassica System	Sarge SHORT KALE Cleancrop™ Brassica System
Kale type	Short height	Short-medium height	Intermediate height	Giant type*	Intermediate height	Short-medium height
Potential yield (tDM/ha)	14	14	16	17	16	14
Winter leaf retention	★★★	★★★	★★★	★★★	★★★	★★★
Leaf percentage	★★★	★★★	★★★	★★	★★★	★★★
Stem quality	★★★	★★★	★★	★★	★★	★★★
More Information	Page 82	Page 81	Page 81	Page 82	Page 66	Page 67

A new generation giant kale with higher leaf-to-stem ratio and softer stems than traditional giant kales.

KEY – = None | ★ = Moderate | ★★ = Good | ★★★ = Very good

Note: a difference of one ★ means that there is statistically significant difference.

BRIAN YOUNG, SOUTHERN SOUTH ISLAND AREA SALES AGRONOMIST, WITH REGAL KALE.

The king of kales

The trailblazer

Regal® KALE

FARM TYPE	SOWING RATE 4 kg/ha
DAYS TO GRAZING	LATE NOVEMBER ONWARDS SOWING **150-220 days** LATE OCTOBER SOWING **100-140 days** till first light grazing

Regal® kale provides high dry matter yield and good forage quality, the best of both worlds. When your animals require more winter dry matter and more leaf, Regal delivers. New Zealand bred, high yielding Regal gives you superior pest and disease tolerance. Late winter leafiness means good quality feed that lasts the distance, ideal for pregnant and young stock.

Choose Regal® when your winter priority is for both yield and forage quality

- Exceptional dry matter yields
- Soft stems providing excellent crop utilisation
- High leaf-to-stem ratio, with very good late-winter leaf percentage
- Strong pest and disease tolerance
- New Zealand bred for local conditions
- Intermediate height

Scan to learn more about Regal

Emblaze KALE NEW

FARM TYPE	SOWING RATE 4 kg/ha
DAYS TO GRAZING	LATE NOVEMBER ONWARDS SOWING **150-220 days** LATE OCTOBER SOWING **100-140 days** till first light grazing

Emblaze is an all-round kale, which replaces Kestrel kale, a cultivar that has a long and proud history of delivering consistent performance throughout the kale growing regions in New Zealand. Retaining and enhancing the many attributes of Kestrel is what characterises Emblaze. High leaf ratio and soft stems, means it can be used for all stock classes including young sheep, cattle and deer. Improvements in yield, disease tolerance and later flowering means the versatility of Emblaze extends beyond traditional Kestrel areas and offers the opportunity to fit into many areas.

- High yielding, short to medium height kale
- Excellent stem softness to promote crop utilisation and good stem quality to enhance animal performance
- Improve disease tolerance compared to Kestrel kale
- Versatility to be used as an autumn feed option

Scan to learn more about Emblaze

The new generation giant kale

Trusted name, trusted quality kale

Corsa KALE

FARM TYPE

DAYS TO GRAZING 150-220 days

SOWING RATE 4 kg/ha

Corsa is a new generation giant type kale that has been bred to revolutionise the giant kale market. With higher leaf percentage and enhanced stem quality than conventional giant kales. Corsa delivers a high yield, high quality feed for your animals.

- High yielding, giant type kale
- High leaf percentage
- Good winter hardiness
- Softer stem compared to other giant type kales
- Good Aphid tolerance
- Highest leaf-to-stem ratio of giant kales

Scan to learn more about Corsa

Kestrel KALE

FARM TYPE

SOWING RATE 4 kg/ha

DAYS TO GRAZING
LATE NOVEMBER ONWARDS SOWING **150-220 days**
LATE OCTOBER SOWING **100-140 days** till first light grazing

Kestrel kale – for when you need exceptionally high quality winter feed for top animal performance. Kestrel has a high leaf percentage and soft, digestible stems that deliver an energy dense, easy-to-graze feed. Soft stems offer excellent crop utilisation, even for young sheep, deer and cattle. Late-winter leafiness means better stock performance throughout the season. Kestrel has the adaptability to fit into a range of farm systems and soil types.

Kestrel, the perfect choice when animal performance is your focus

- High leaf-to-stem ratio with very good late-winter leafiness
- Excellent stem softness to promote crop utilisation and good stem quality to enhance animal performance
- Good regrowth if lightly grazed during late summer
- Short height

Scan to learn more about Kestrel

Forage Rape

Forage Rapes are a summer/autumn/winter feed suitable for all stock classes. Modern New Zealand bred cultivars are an interspecies cross between rape and kale parentage. Forage rapes range in maturity dates from 70-110 days after sowing, while also having single or multi-graze options.

WHEN TO SOW? Spring sow for summer, autumn and winter feed.
Winter feed from spring sowing is dependent on environment and crop management.
Late summer/early autumn sow when moisture permits for winter feed.

	Forage quality and early maturity	Yield and forage quality	Yield and forage quality with Telar® herbicide resistance
	Titan® Forage Rape	Goliath® Forage Rape	Rape Cleancrop® Brassica System
Establishment	Spring/summer/autumn	Spring/summer/autumn	Spring/summer/autumn
Days to grazing	70-90	90-110	90-100
Regrowth	★★	★★★	★★★
Aphid tolerance	★★★	★★★	★★★
Energy content	★★★	★★	★★
More Information	Page 84	Page 84	Page 73

KEY – = None | ★ = Moderate | ★★ = Good | ★★★ = Very good

Note: a difference of one ★ means that there is statistically significant difference.

The trusted performer

Goliath® FORAGE RAPE

FARM TYPE

DAYS TO GRAZING 90-110 days **SOWING RATE** 4 kg/ha

Goliath® forage rape – the multi-purpose forage rape that fits all farm systems. Goliath performs well from spring/summer/autumn sowing, offering flexibility to deliver feed when you need it. Graze Goliath once or take advantage of superior regrowth potential for multiple grazings; the perfect versatile feed option for all stock classes. Good Aphid tolerance means Goliath will go the distance.

Goliath® forage rape is ideal when crop versatility and dry matter yield are important to you

- Very good Aphid tolerance
- High dry matter yields
- Multi-purpose forage rape from spring/summer/autumn sowing
- Single or multi-graze feed option
- Superior regrowth potential
- Excellent winter-keeping properties

Scan to learn more about Goliath

The tasty forage rape

Titan® FORAGE RAPE

FARM TYPE

DAYS TO GRAZING 70-90 days **SOWING RATE** 4 kg/ha

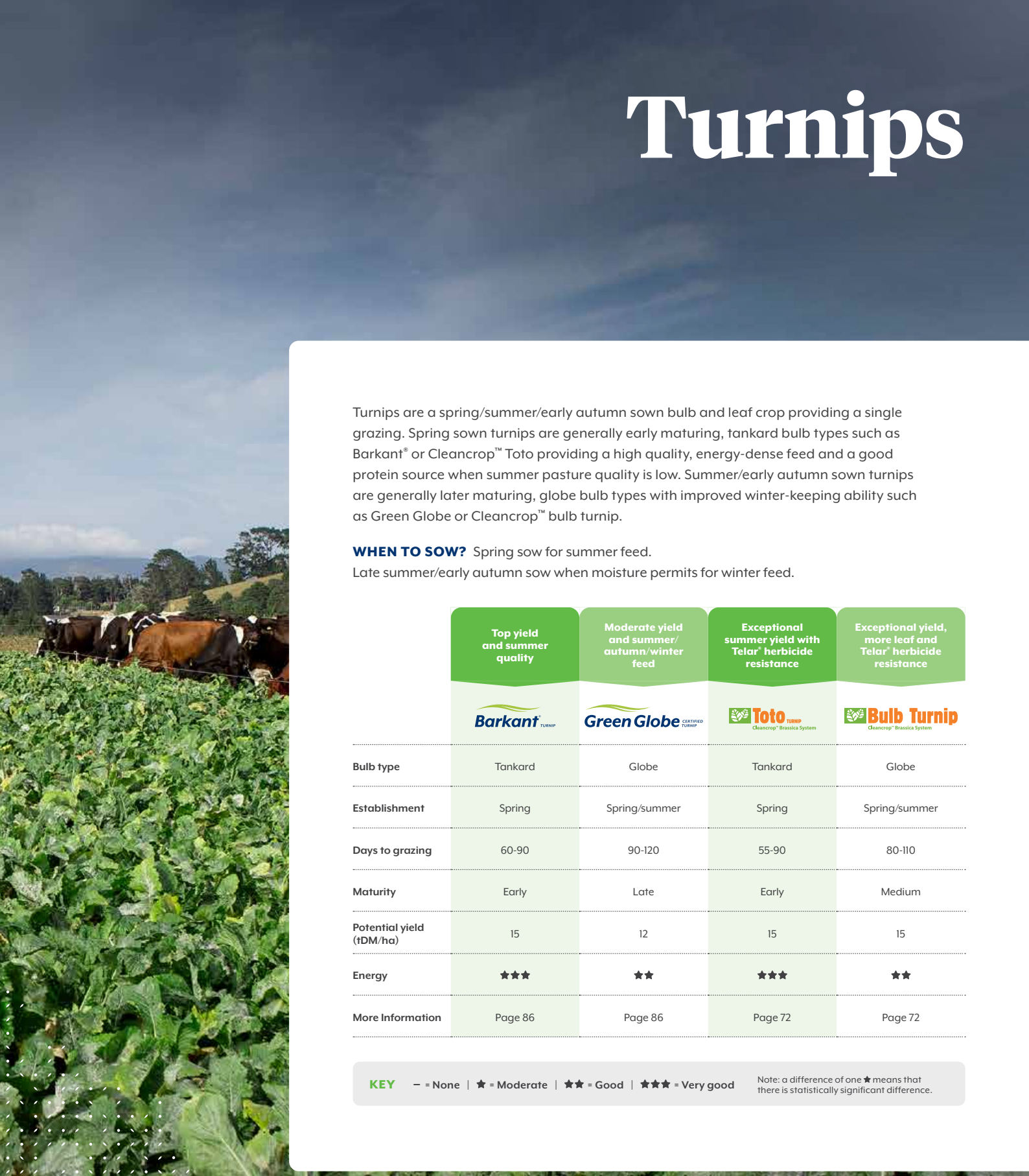
Titan® forage rape – the tasty, palatable rape with high grazing preference and rapid acceptance by stock. Titan combines early maturity, high dry matter yields and excellent palatability to deliver a high quality summer/autumn/winter feed option. Strong regrowth potential offers a multi-graze option for all farm systems. Good Aphid and virus tolerance means Titan will last the distance under challenging conditions.

The best choice when forage quality and rapid acceptance by stock is important to you

- Highest animal grazing preference forage rape cultivar available
- Very good Aphid and virus tolerance
- Excellent whole plant quality
- Multi-graze option with good regrowth potential
- Early maturing

Scan to learn more about Titan

Turnips



Turnips are a spring/summer/early autumn sown bulb and leaf crop providing a single grazing. Spring sown turnips are generally early maturing, tankard bulb types such as Barkant® or Cleancrop™ Toto providing a high quality, energy-dense feed and a good protein source when summer pasture quality is low. Summer/early autumn sown turnips are generally later maturing, globe bulb types with improved winter-keeping ability such as Green Globe or Cleancrop™ bulb turnip.

WHEN TO SOW? Spring sow for summer feed.
Late summer/early autumn sow when moisture permits for winter feed.

	Top yield and summer quality	Moderate yield and summer/ autumn/winter feed	Exceptional summer yield with Telar® herbicide resistance	Exceptional yield, more leaf and Telar® herbicide resistance
	Barkant® Turnip	Green Globe Certified Turnip	Toto Turnip Cleancrop™ Brassica System	Bulb Turnip Cleancrop™ Brassica System
Bulb type	Tankard	Globe	Tankard	Globe
Establishment	Spring	Spring/summer	Spring	Spring/summer
Days to grazing	60-90	90-120	55-90	80-110
Maturity	Early	Late	Early	Medium
Potential yield (tDM/ha)	15	12	15	15
Energy	★★★	★★	★★★	★★
More Information	Page 86	Page 86	Page 72	Page 72

KEY – = None | ★ = Moderate | ★★ = Good | ★★★ = Very good

Note: a difference of one ★ means that there is statistically significant difference.

New Zealand's leading dairy turnip

Barkant® TURNIP

FARM TYPE	
DAYS TO GRAZING	60-90 days
SOWING RATE	1-3 kg/ha

Barkant® bulb turnip is one of the highest yielding summer bulb turnips available in New Zealand. You deserve the best turnip on the market and your stock deserve the best quality feed. Barkant offers unbeatable proven performance year after year. Barkant delivers supplementary protein within the leaf and water soluble carbohydrates in the bulb, offering an ideal feed to balance summer pastures.

When you need summer feed, don't look past Barkant®

- High dry matter yields
- High source of metabolisable energy (MJME)
- Tankard bulb shape enhances crop utilisation and reduces the risk of choke
- Early maturing for excellent summer feed
- High leaf-to-bulb ratio resulting in high levels of protein

Scan to learn more about Barkant

The multi-purpose performer

Green Globe CERTIFIED TURNIP

FARM TYPE	
DAYS TO GRAZING	90-120 days
SOWING RATE	0.8-2 kg/ha

Green Globe turnip – the reliable turnip that delivers good dry matter yields for your stock. It delivers flexible sowing options. Green Globe will perform in harsh winter conditions and lower soil fertility. When the going gets tough Green Globe performs for your stock.

Green Globe is the dependable turnip for tough conditions

- Multi-purpose turnip suitable for summer, autumn and winter feed
- Proven winter hardiness
- Good yield potential
- Late maturing

Scan to learn more about Green Globe

Leafy Turnips

Leafy turnips are a spring sown, multi-graze brassica crop that can offer three to four grazings. Leafy turnips are earlier maturing than forage rape, whereby the first grazing is possible from 42 days after sowing. Generally, leafy turnips are spring sown to provide a high-quality summer feed for drystock farming systems. Leafy turnips are a shallow-rooted, swollen bulb crop and therefore, they are susceptible to drought and poor soil fertility. In dryland environments, Pallaton Raphno® with increased drought tolerance may be more suitable.

WHEN TO SOW? Spring/summer

	Fast summer feed	Yield and forage quality with Telar® herbicide resistance
	Pasja II FORAGE BRASSICA	Leafy Turnip Cleancrop™ Brassica System
Bulb type	Swollen root	Swollen root
Establishment	Spring/summer	Spring/summer
Days to grazing	42-70	42-70
Maturity	Early	Early
Potential yield (tDM/ha)	9	11
Grazing/regrowth	Multi-graze	Multi-graze
Energy	★★★	★★★
More Information	Page 88	Page 73

KEY – = None | ★ = Moderate | ★★ = Good | ★★★ = Very good

Note: a difference of one ★ means that there is statistically significant difference.

The faster brassica feed

Pasja II FORAGE BRASSICA

Scan to learn more about Pasja II

FARM TYPE	DAYS TO GRAZING	SOWING RATE
	42-70 days	4 kg/ha

Pasja II – the brassica to choose when fast, high quality summer/autumn feed is needed for your stock. Pasja II combines early maturity with yield and the option for multiple grazings, providing quality fast feed you can rely on.

Pasja II is the brassica you need for your stock when fast, quality feed is needed

- High dry matter yields
- Excellent plant persistence
- Multi-graze option with excellent regrowth potential (moisture dependent)
- Fast establishing with first grazing possible at 42-70 days
- Minimal ripening required
- Reduced bolting
- A flexible grazing option for summer/autumn feed

Seed Treatment

WHY TAKE THE RISK?

Seed treatment can improve seed germination, seedling emergence, plant vigour, stand establishment and total yield, helping to ensure the crop or pasture is on its way to reaching its full genetic potential.

Benefits of seed treatment

INSURANCE POLICY

Reduces risk and helps safeguard investment in forage seed. The cost of failed pasture establishment can be in excess of $2,000/ha with lost production and re-planting costs. In a forage crop situation, the loss of plants can significantly reduce potential crop yield, as well as increasing the overall feed cost.

AGRONOMIC BENEFIT

Seedlings protected by seed treatment are in a better position to withstand environmental stresses, including pest and disease pressure. Seed treatment helps maximise seedling establishment and nurture early plant growth, helping ensure the crop or pasture is in a position to reach its full yield potential.

TARGETED PROTECTION

Seed-applied chemicals are target specific against a range of economically damaging insect pests and diseases during the plant establishment period.

INTEGRATED PEST MANAGEMENT

Complements traditional broadacre crop protection methods and other new plant protection technology such as endophytes, as part of an integrated pest management approach.

REDUCED ENVIRONMENTAL IMPACT

Delivers very small quantities of chemical active ingredient to the soil in comparison to broadacre applications. Chemicals are rigorously tested to ensure they have no detrimental effects on the environment.

IMPROVES SOWING ACCURACY

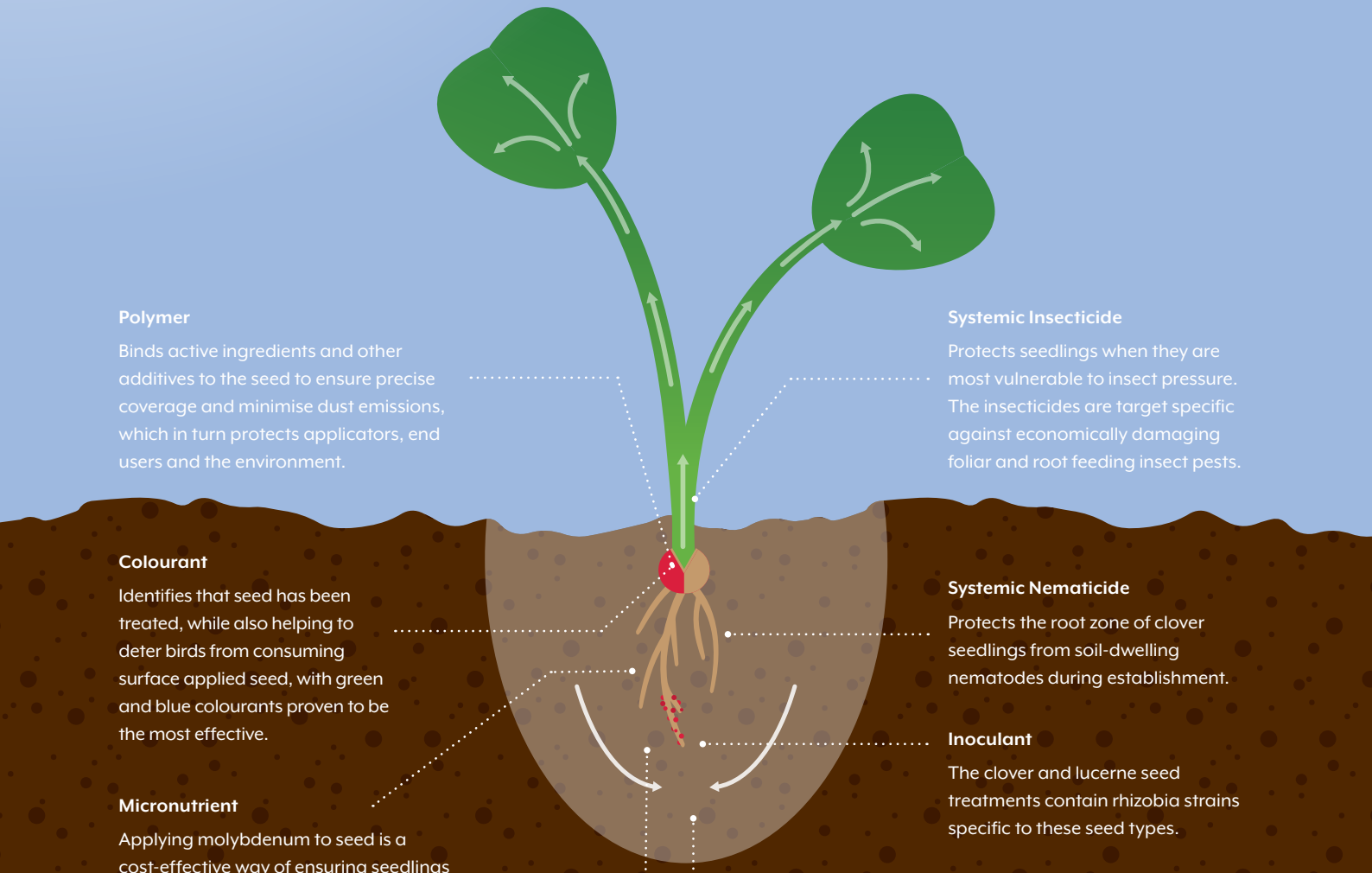
The addition of seed coating material to seed can increase weight and size to provide a more accurate and uniform spread of seed in aerial oversowing applications and enable uniform plant spacing in precision drilling.

USER-FRIENDLY

Reduces the need to handle chemicals on farm. It also allows more flexibility when weather conditions make it difficult to apply broadacre crop protection products.

Building better seeds: What's in seed treatment products?

The seed treatment formulations developed by PGG Wrightson Seeds Limited contain additives that are unique to the seed type and/or end use. These additives combine to provide a better environment for seedling establishment and early growth. Most products contain a systemic insecticide, with at least one contact fungicide, along with other beneficial additives including micronutrients.



Polymer

Binds active ingredients and other additives to the seed to ensure precise coverage and minimise dust emissions, which in turn protects applicators, end users and the environment.

Systemic Insecticide

Protects seedlings when they are most vulnerable to insect pressure. The insecticides are target specific against economically damaging foliar and root feeding insect pests.

Colourant

Identifies that seed has been treated, while also helping to deter birds from consuming surface applied seed, with green and blue colourants proven to be the most effective.

Systemic Nematicide

Protects the root zone of clover seedlings from soil-dwelling nematodes during establishment.

Inoculant

The clover and lucerne seed treatments contain rhizobia strains specific to these seed types.

Micronutrient

Applying molybdenum to seed is a cost-effective way of ensuring seedlings have a start-up supply of this important micronutrient, which is required for plant growth and root nodulation in legumes.

Lime

The application of fine lime in legume seed treatment can provide a localised increase in soil pH around the seedling, assisting root nodulation. Lime also benefits aerial oversowing with the added weight improving seed ballistics.

Contact Fungicide

Protects seedlings from common seed and soil-borne fungal pathogens. Young seedlings are most susceptible to disease infection during establishment, particularly those under environmental stress.

**It should be noted that while each specific seed treatment contains a range of additives, none of the seed treatment products contain all of the additives featured in the graphic above.*

Grass seed treatment

Regrassing is important for increasing pasture productivity and farm profitability. It is a process that requires thorough planning to achieve a successful outcome. Seed treatment has an important role to play in this process, helping protect young seedlings against invasive insect pests and diseases when they are at their most vulnerable stage. The successful establishment of forage grass is the critical first step in achieving a high yielding pasture.

Superstrike® grass

Superstrike® grass is a filmcote seed treatment that combines insecticide, fungicide and plant nutrition additives.

WHERE SHOULD SUPERSTRIKE GRASS BE USED?

Superstrike grass seed treatment is recommended for all spring and autumn sown grass seed, including ryegrass, fescue and cocksfoot, where Argentine Stem Weevil, Black Beetle or Grass Grub are active. The presence of these harmful insect pests during pasture establishment can result in significant losses ranging from a partial to a total resow if the seed is unprotected. The early growth of slow establishing species such as fescue and cocksfoot is also enhanced by seed treatment through the positive effect on plant vigour.

Additive	Pest and disease protection/nutrients	Benefit
Systemic insecticide	Argentine Stem Weevil (adults and larvae), Black Beetle (adults), Grass Grub (larvae)	Above and below ground protection against economically damaging insect pests during the first six weeks after planting.
Contact fungicide	'Damping off' *(Pythium, Fusarium)*	Protects the root zone from 'Damping off' fungal pathogens in the first three to four weeks of establishment.
Nutrient	Zinc, Molybdenum, Manganese	Nutrients are distributed evenly around the seed and available for fast uptake by the germinating seedling.
Bird repellent		The green coloured treatment and the fungicide component have properties that help deter birds from eating surface applied seed.

Prillcote® grass

Prillcote® grass is a seed treatment developed for oversowing. It provides plant protection, plant nutrition and weight build-up additives formulated to improve the physical application of seed and the subsequent establishment and growth of grass seedlings in hill and high country environments.

WHERE SHOULD PRILLCOTE GRASS BE USED?

Prillcote grass seed treatment is recommended for all grass seed applied in an aerial oversowing programme. With the seed coat increasing the weight of the seed by 100%, the sowing rate of Prillcote grass seed should be increased by 100% in comparison to untreated seed.

Additive	Disease protection /nutrients	Benefit
Contact fungicide	'Damping off' *(Pythium, Fusarium)*	Protects the root zone from 'Damping off' fungal pathogens in the first three to four weeks of establishment.
Nutrient	Lime	Provides the weight increase for improved ballistics, helping ensure more seed reaches its target on the soil surface. Also helps provide a localised pH correction around the seedling.
Bird repellent		The green coloured treatment and the fungicide component have properties that help deter birds from eating surface-applied seed.

Clover seed treatment

The application of plant protection and plant nutrition agents, in addition to *rhizobia* to clover and lucerne seed, is a very cost-effective means of delivering these additives to the soil to enhance the establishment and growth of seedlings. The successful establishment of clover seed is an important step in setting up a high producing pasture sward.

Superstrike® clover

Superstrike® clover is a seed treatment that combines plant protection and plant nutrition additives. The application of pesticide on clover seed is one of the few means by which seedlings can be protected against invasive and costly root-feeding nematodes during early plant development.

WHERE SHOULD SUPERSTRIKE CLOVER BE USED?

Superstrike clover seed treatment is recommended for all clover seed sown in pasture mixes or specialist herb mixes including white, red, subterranean and annual clovers. With the seed coat increasing the weight of the seed by 75%, the sowing rate of Superstrike clover seed should be increased by 75% in comparison to untreated seed. Superstrike treated white and red clover seed products are generally sown in the range of 4-6 kg/ha, respectively in pasture seed mixes.

Additive	Pest protection/ nutrients	Benefit
Systemic nematicide	Clover Root Nematodes	Protects the root zone during plant establishment.
Nutrient	Lime	Helps provide a localised pH correction around the seedling and assists root development.
Nutrient	Molybdenum	Provides a start-up supply of this important micronutrient, which is required for root nodulation and seedling growth. Molybdenum is distributed evenly around the seed and available for fast uptake by the germinating seedling.
Rhizobia*		Seed inoculated with nitrogen-fixing bacteria specific to clover.

**Note: Continued presence of* rhizobia *after inoculation and establishment of* rhizobia *in pasture depends on many things and is not guaranteed.*

Prillcote® clover

Prillcote® clover is a seed treatment developed for oversowing. It includes plant nutrition and weight build-up additives formulated to improve the physical application of seed and the subsequent establishment and growth of clover seedlings in hill and high country environments.

WHERE SHOULD PRILLCOTE CLOVER BE USED?

Prillcote clover seed treatment is recommended for all clover seed applied in an aerial oversowing programme. With the seed coat increasing the weight of the seed by 75%, the sowing rate of Prillcote clover seed should be increased by 75% in comparison to untreated seed. Prillcote clover seed products are generally sown in the range of 4-6 kg/ha.

Additive	Nutrients	Benefit
Nutrient	Lime	Provides the weight increase for improved ballistics, helping ensure more seed reaches its target on the soil surface. Also helps provide a localised pH correction around the seedling and assists root development.
Nutrient	Molybdenum	Provides a start-up supply of this important micronutrient, which is required for root nodulation and seedling growth. Molybdenum is distributed evenly around the seed and available for fast uptake by the germinating seedling.
Rhizobia*		Seed inoculated with nitrogen-fixing bacteria specific to clover.

**Note: Continued presence of* rhizobia *after inoculation and establishment of* rhizobia *in pasture depends on many things and is not guaranteed.*

Lucerne seed treatment

Superstrike® Lucerne

Superstrike® lucerne is a seed treatment that combines plant protection and plant nutrition additives. The seed treatment also provides a very cost-effective means of introducing rhizobia into the soil profile at sowing time. The rhizobia strain specific to lucerne is not widespread in New Zealand soils, hence the importance of sowing pre-inoculated seed.

WHERE SHOULD SUPERSTRIKE LUCERNE BE USED?

Superstrike lucerne seed treatment is recommended for all lucerne seed. With the seed coat increasing the weight of the seed by 25%, the sowing rate of Superstrike lucerne seed should be increased by 25% in comparison to untreated seed. Superstrike lucerne seed products are generally sown in the range of 10-14 kg/ha.

Additive	Disease protection /nutrients	Benefit
Contact fungicide	'Damping off' *(Pythium)*	Protects the root zone from the 'Damping off' fungal pathogen in the first three to four weeks of establishment.
Nutrient	Lime	Helps provide a localised pH correction around the seedling and assists root development.
Nutrient	Molybdenum	Provides a start-up supply of this important micronutrient, which is required for root nodulation and seedling growth. Molybdenum is distributed evenly around the seed and available for fast uptake by the germinating seedling.
Rhizobia		Seed inoculated with nitrogen-fixing bacteria specific to lucerne.

Herb seed treatment

Superstrike® herb

Forage herbs such as chicory and plantain are now widely utilised in pastoral farming systems. Protecting young vulnerable seedlings during the establishment phase with seed treatment is considered best practice to help maximise seedling emergence and survival.

WHERE SHOULD SUPERSTRIKE HERB BE USED?

Superstrike® herb seed treatment is recommended for all chicory and plantation seed sown as a short-term summer fed crop, a multi-year specialist crop and a component of pasture mixes. Superstrike treated seed should be sown at the same rate as untreated seed. Livestock should not graze Superstrike treated herb is in the first 6 weeks after sowing.

Additive	Pest and disease protection	Benefit
Systemic insecticide	Springtail	Above and below ground protection during the first six weeks after planting.
Contact fungicide	'Damping off' *(Pythium, Fusarium)*	Protects the root zone from 'Damping off' fungal pathogens in the first three to four weeks of establishment.
Bird repellent		The green coloured treatment and the fungicide component have properties that help deter birds from eating surface applied seed.

Brassica seed treatment

Forage brassica crops are extremely vulnerable to insect attack during the plant establishment period. The loss of plants early can have a major impact on the final crop yield. Brassica seed treatment provides a low cost but very important early plant protection tool, helping ensure crops establish successfully so that they can reach their full yield potential.

Ultrastrike® brassica

Ultrastrike® brassica is a filmcote seed treatment that provides establishing brassica crops with a superior level of insecticide protection in addition to fungicide protection and a start-up supply of molybdenum.

WHERE SHOULD ULTRASTRIKE BRASSICA BE USED?

Ultrastrike brassica seed treatment is recommended for all spring and autumn sown forage brassica seed including rape, turnips, kale and swedes, where seedlings are likely to face risk from the target pests and diseases (see table below). Ultrastrike is a filmcote seed treatment with no weight gain, therefore seed should be sown at the same rate as untreated seed. Livestock should not graze Ultrastrike treated brassica crops in the first six weeks after sowing.

Additive	Pest and disease protection/nutrients	Benefit
Systemic insecticide	Springtail, Aphid, Argentine Stem Weevil (adults and larvae), *Nysius**	Above and below ground protection during the first six weeks after planting against economically damaging insect pests. Trials have shown protection against Aphids extending out to eight weeks after planting.
Contact fungicide	'Damping off' *(Pythium, Fusarium, Rhizoctonia solani)*	Protects the root zone from 'Damping off' fungal pathogens in the first three to four weeks of establishment.
Nutrient	Molybdenum	Molybdenum is distributed evenly around the seed and available for fast uptake by the germinating seedling.

**Note: In situations conducive to high* Nysius *pressure, where a brassica crop is sown next to a lucerne crop or established under hot, dry conditions, a foliar insecticide application may be necessary 2-3 weeks after sowing to enhance protection.*

Gaucho®

Gaucho® brassica is a filmcote seed treatment that provides brassica crops with protection against common insect pests during plant establishment.

WHERE SHOULD GAUCHO BRASSICA BE USED?

Gaucho brassica seed treatment is recommended for spring and autumn sown forage brassica seed. Gaucho is a filmcote seed treatment, therefore seed should be sown at the same rate as untreated seed. Livestock should not graze Gaucho treated brassica crops in the first six weeks after sowing.

Additive	Pest protection	Benefit
Systemic insecticide	Springtail, Aphid, Argentine Stem Weevil (adults and larvae), *Nysius**	Above and below ground protection during the first six weeks after planting.

**Note: In situations conducive to high* Nysius *pressure, where a brassica crop is sown next to a lucerne crop or established under hot, dry conditions, a foliar insecticide application may be necessary 2-3 weeks after sowing to enhance protection.*

Seed treatment product profiles

Seed Treatment	Used in	Pest protection	Disease protection	Nutrients included	Rhizobia	Weighted build-up	Sowing rates compared to untreated seed	Withholding period
Ultrastrike® brassica	Drill/Broadcast	Aphid Argentine Stem Weevil *Nysius* (Wheat Bug) Springtail	*Fusarium* *Pythium* *Rhizoctonia solani*	Molybdenum	–	0%	Same as per untreated seed	6 weeks
Gaucho®	Drill/Broadcast	Aphid Argentine Stem Weevil *Nysius* (Wheat Bug) Springtail	–	–	–	0%	Same as per untreated seed	6 weeks
Superstrike® grass	Drill/Broadcast	Argentine Stem Weevil (adults and larvae) Black Beetle (adults) Grass Grub (larvae)	*Fusarium* *Pythium*	Manganese Molybdenum Zinc	–	0%	Same as per untreated seed[#]	6 weeks[^]
Prillcote® grass	Oversowing	–	*Fusarium* *Pythium*	Lime	–	100%	Increase by 100%	–
Superstrike® clover	Drill/Broadcast	Clover Root Nematode	–	Lime Molybdenum	Yes[*]	75%	Increase by 75%	6 weeks
Prillcote® clover	Oversowing	–	–	Lime Molybdenum	Yes[*]	75%	Increase by 75%	–
Superstrike® Lucerne	Drill	–	*Pythium*	Lime Molybdenum	Yes	25%	Increase by 25%	–
Superstrike® herb	Drill/Broadcast	Springtail	*Fusarium* *Pythium*	–	–	0%	Same	6 weeks
Prillcote Herb	Oversowing	–	*Fusarium* *Pythium*	Lime	–	100%	Increase by 100%	–

[*] *Continued presence of rhizobia after inoculation and establishment of rhizobia in pasture depends on many things and is not guaranteed.*

[#] *For Grass Grub protection a minimum sowing rate of 15 kg/ha is required.*

[^] *For Superstrike® treated grass seed undersown into an existing pasture sward, the livestock witholding period is three weeks from sowing.*

Pasture pests

ASW is a common pasture pest throughout New Zealand. Adult ASW feed all year round on leaves, however not as significantly as larvae feeding.

Control:

- Use of Superstrike® grass seed treatment for seedling protection.
- Use of grasses with AR1, AR37 or MaxP® endophyte.
- Sowing grass after peak ASW flights.
- Cultivation to destroy larval weevil population.

Black Beetle is a major pest in the northern North Island, with warmer years favouring population growth. Both adults and larvae damage pastures.

Control:

- AR37 or MaxP® endophytes will deer adult Black Beetle, but not larvae.
- Use of Superstrike® grass seed treatment to protect seedlings.
- Use of summer forage crops (e.g. brassica or chicory) to break the life cycle.

Black Field Cricket is found throughout the North Island and in milder coastal regions of the South Island. In high populations they can cause significant pasture loss and damage.

Control:

- Cricket Bait for Black Field Cricket control is recommended when populations exceed ten crickets per m^2.
- Insecticide application.
- Use of a summer forage crop (brassica or chicory).

Grass Grubs are found throughout New Zealand and can cause severe damage to pasture.

Control:

- Use of Superstrike® grass seed treatment for seedling protection.
- Granular insecticides sown in the root zone. These are becoming limited in future.
- Cultivation will reduce populations but can predispose pasture to damage 2-3 years later.
- Heavy stocking or rolling to squash larvae in autumn.

Fall army worm has been detected in New Zealand since 2022 and feeds on over 350 plant species. FAW spreads from Australia to New Zealand through large wind events. FAW persistence is decreased by the inability to hibernate overwinter, with the population dying out through this period.

Control:

- Control of FAW can be difficult. Managing weed infestation in crop can reduce larval infestations.
- Providing optimum growing conditions for the crop increases the resilience to insect pressure.
- Limited chemical control is available depending on crop stage and pest activity.

Porina moths fly during spring and early summer, while caterpillars and their subsequent damage will be most noticeable from April through to September.

Control:

- Use grasses with AR37 endophyte.
- Regular pasture monitoring.
- Mob stocking of pastures to avoid poor quality pasture and build-up of debris.
- Insecticide application.
- Heavy stocking or rolling to squash larvae.

Clover Root Weevil is a major clover pest and can have significant economic impact.

Control:

- Choose cultivars with higher tolerance to CRW (e.g. Legacy).
- Nitrogen fertiliser to reduce the effects of reduced N fixation.
- Cultivation/PGG Wrightson Seeds Programmed Approach®.

A very common and significant pest in all crops. Slugs are present all year round, but are most damaging in spring and autumn.

Control:

- Always use slug bait in direct drill situations. Closely monitor ALL crops for slug presence during establishment and treat accordingly.

Clover Cyst Nematode, Root-knot Nematode and Lesion Nematode are all known to affect white clover and other clover species.

Control:

- Use of Superstrike® clover seed treatment for seedling protection.
- Application of nutrients, including phosphate and molybdenum, to increase clover growth.

A pasture pest mainly found in the Canterbury, Manawatu and Nelson regions.

Control:

- Use of grasses with standard, AR1, AR37 or MaxP® endophytes.

Relatively minor pest in pasture and crops. It can be found throughout the North Island and much of the South Island.

Control:

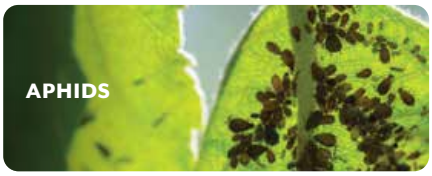
- Thorough cultivation should be carried out through late spring and summer prior to sowing in infested areas. Clean fallow reduces numbers.

Root Aphids are found throughout New Zealand and feed on ryegrass roots, sucking sap from the grass.

Control:

- Use of AR37 endophyte will provide good protection from Root Aphids.

Brassica pests



Aphids are a pest to all brassica types, and found throughout New Zealand.

Control:

- Use of Ultrastrike® or Gaucho® brassica seed treatment for seedling protection.
- Use of Aphid tolerant varieties or species, including Raphno®.
- Application of insecticide at early stages.
- Recognise flight periods and control infestations early.

A pest of all brassica crops, Diamondback Moth can be found throughout New Zealand. Caterpillars do the damage by feeding on leaves of brassica plants.

Control:

- Application of an appropriate insecticide.
- Removal of old brassica plants which may act as a carryover host.

Leaf Miner is a pest to brassicas and is found throughout New Zealand. The Leaf Miner fly lays larvae which causes the damage to plants.

Control:

- Early identification and spray with the appropriate insecticide.
- Removal of alternative hosts, such as fathen and sow thistle, to prevent build-up of numbers.

Grass Grubs are found throughout New Zealand and can cause severe damage to brassica crops.

Control:

- Cultivation in spring prior to sowing brassica crop.
- Granular insecticides sown in the root zone. These are becoming limited in future.
- Heavy grazing.

White Butterfly are found throughout New Zealand and are a common pest to all brassica crops. The White Butterfly caterpillar feeds on all brassica crops.

Control:

- Application of an appropriate insecticide.

ASW is a common pasture pest that occasionally affects brassica seedlings throughout New Zealand.

Control:

- Use of Ultrastrike® or Gaucho® brassica seed treatment for seedling protection.
- Cultivation to destroy larval weevil population.

A common pest throughout New Zealand, causing damage to germinating and newly emerged seedlings. Can be identified by tapping the ground around a sheet of white A4 paper and observing the jumping of pin head sized insects.

Control:

- Use of Ultrastrike® or Gaucho® brassica seed treatment for seedling protection. When establishing forage brassica out of old pasture, it is strongly recommended to apply an appropriate contact insecticide before or after sowing to reduce the adult population.

A common pest throughout New Zealand that is more common in warm and dry areas. It can be very damaging to germinating brassica crops if left untreated.

Control:

- Ultrastrike® or Gaucho® brassica seed treatment helps protect seedlings.
- Apply an appropriate insecticide before or after sowing.

Fall army worm has been detected in New Zealand since 2022 and feeds on over 350 plant species. FAW spreads from Australia to New Zealand through large wind events. FAW persistence is decreased by the inability to hibernate overwinter, with the population dying out through this period.

Control:

- Control of FAW can be difficult. Managing weed infestation in crop can reduce larval infestations.
- Providing optimum growing conditions for the crop increases the resilience to insect pressure.
- Limited chemical control is available depending on crop stage and pest activity.

A very common and significant pest in all crops. Slugs are present all year round but are most damaging in spring and autumn.

Control:

- Always use slug bait in direct drill situations. Closely monitor ALL crops for slug presence during establishment, and treat accordingly.

Relatively minor pest in pasture and crops. It can be found throughout the North Island and much of the South Island.

Control:

- Thorough cultivation should be carried out through late spring and summer prior to sowing in infested areas. Clean fallow reduces numbers.

Found throughout New Zealand, and although it is usually considered a minor pest, some years it can have significant impacts on establishing crops.

Control:

- Good seed bed cultivation and compaction.
- Application of an appropriate insecticide as soon as damage is recognised.

APPENDIX

Sowing rates

Table 1 – Crop options

Crop options	Longevity	Bare seed weight (seeds/kg)	Sowing Rate (kg/ha)			Feed value	Grazing tolerance	Drought tolerance	Water-logging tolerance	Frost tolerance	Silage potential
			Pure sward	High	Low						
Tick beans (Faba beans)	Annual	1,100-2,850	100-200	50 (6-14 plants/m²)	10	♦♦♦	♦	♦	♦♦	♦♦♦	♦♦♦
Sunflower	Annual	8,000-25,000	12-15	4-5 (3-13 plants/m²)	1-3	♦	♦	♦♦	♦	♦	♦♦♦
Vetch (common)	Annual	11,000-15,000	50	15-25	3-4	♦♦	♦	♦♦	♦	♦♦♦	♦♦♦
Vetch (hairy)	Annual	18,000-29,000	25-40	10-15	2-3	♦	♦	♦♦	♦	♦♦♦	♦♦♦
Buckwheat	Annual	28,500	40-50	4-5	2-3	♦	♦	♦	♦	♦	♦
Daikon radish	Annual	70,000-88,000	8-12	4	1-2	♦♦	♦	♦♦	♦♦	♦♦♦	♦
Linseed	Annual	143,000	40	10	1-2.5	♦	♦	♦	♦	♦	♦
Mustard	Annual	166,000	8-12	3-4	1-2	♦	♦	♦	♦	♦♦	♦
Phacelia	Annual	330,000-500,000	5-10	2	0.25-0.5	♦	♦	♦♦	♦	♦♦♦	♦

Table 2 – Herbs and legumes

Crop options	Longevity	Bare seed weight (seeds/kg)	Sowing Rate (kg/ha)			Feed value	Grazing tolerance	Drought tolerance	Water-logging tolerance	Frost tolerance	Silage potential
			Pure sward	High	Low						
White clover	Perennial	1,400,000	-	4-6	2-3	♦♦♦♦	♦♦♦♦	♦♦	♦	♦♦♦♦	♦♦♦♦
Red clover	Perennial	300,000 (tetraploid) - 500,000 (diploid)	8-12	5-6	3-4	♦♦♦♦	♦♦♦	♦♦♦	♦	♦♦♦♦	♦♦♦♦
Sub clover	Annual	150,000	8-12	5-6	3-4	♦♦♦♦	♦♦♦	♦♦♦	♦	♦♦♦♦	♦♦♦♦
Balansa clover	Annual	850,000-1,400,000	6-10	5-6	2-3	♦♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦♦
Crimson clover	Annual	250,000	10-20	6	2	♦♦♦♦	♦♦♦	♦♦♦	♦♦	♦♦♦♦	♦♦♦♦
Persian clover	Annual	800,000-900,000	6-8	4-5	2	♦♦♦♦	♦♦	♦♦	♦♦♦	♦♦♦♦	♦♦♦♦
Strawberry clover	Short-lived perennial	666,000	-	6	2	♦♦♦♦	♦♦♦♦	♦♦♦	♦♦	♦♦♦♦	♦♦♦♦
Caucasian clover	Perennial	450,000	-	5	2	♦♦♦♦	♦♦♦♦	♦♦♦	♦♦	♦♦♦♦	♦♦♦♦
Lotus major *(Lotus pedunculatus)*	Perennial	1,200,000 (tetraploid) - 2,000,000 (diploid)	5	3	1	♦♦♦	♦♦	♦♦♦♦	♦♦♦	♦♦♦	♦♦♦
Birdsfoot trefoil *(Lotus corniculatus)*	Short-lived perennial	850,000	10	6-10	3	♦♦♦	♦♦	♦♦♦♦	♦♦♦	♦♦♦	♦♦♦
Plantain	Perennial	500,000	10	2-3	1	♦♦♦	♦♦♦♦	♦♦♦	♦♦	♦♦♦♦	♦♦♦
Sheeps burnet	Short-lived perennial	154,000	5-20	3-4	1-2	♦♦♦	♦♦♦	♦♦♦♦	♦	♦♦♦♦	♦♦♦
Lupins (blue)	Annual	4,000	10-40	10 (4 plants/m²)	3-4	♦♦	♦♦	♦♦♦	♦	♦♦♦♦	♦♦
Sulla	Short-lived perennial	190,000	10-12	6	2	♦♦♦	♦♦	♦♦♦	♦	♦♦♦♦	♦♦♦♦
Lucerne	Perennial	500,000	10-14	6	3	♦♦♦♦	♦♦♦	♦♦♦♦	♦	♦♦♦♦	♦♦♦♦

Table 3 – Grasses

Crop options	Longevity	Bare seed weight (seeds/kg)	Sowing Rate (kg/ha)			Feed value	Grazing tolerance	Drought tolerance	Water-logging tolerance	Frost tolerance	Silage potential
			Pure sward	High	Low						
Perennial ryegrass	Perennial	255,000 (tetraploid) - 500,000 (diploid)	20-30	16-30	3-6	♦♦♦	♦♦♦♦	♦♦	♦♦	♦♦♦♦	♦♦♦♦
Cocksfoot	Perennial	1,000,000 - 1,200,000	8-10	6-10	2-3	♦♦	♦♦♦♦	♦♦♦♦	♦♦♦	♦♦♦♦	♦♦♦
Tall fescue	Perennial	400,000	22-32	16-32	3-4	♦♦	♦♦♦	♦♦♦♦	♦♦♦♦	♦♦♦♦	♦♦♦
Meadow fescue	Perennial	500,000	20-24	12-24	3-4	♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦♦	♦♦♦
Grazing brome & pasture brome	Perennial	90,000	25-30	10-20	4	♦♦	♦♦♦♦	♦♦♦	♦	♦♦♦♦	♦♦
Prairie grass	Short-lived perennial	90,000	25-30	10-20	4	♦♦	♦♦♦	♦♦♦	♦	♦♦♦♦	♦♦
Phalaris	Perennial	550,000	-	4	1	♦♦	♦♦♦♦	♦♦♦♦	♦♦♦♦	♦♦♦♦	♦
Timothy	Perennial	2,500,000	6-8	3	1	♦♦♦	♦♦♦	♦♦	♦♦♦	♦♦♦♦	♦♦♦♦

Table 4 – Cereal options

Crop options	Longevity	Bare seed weight (seeds/kg)	Sowing Rate (kg/ha)			Feed value	Grazing tolerance	Drought tolerance	Water-logging tolerance	Frost tolerance	Silage potential
			Pure sward	High	Low						
Barley (greenfeed)	Annual	18,000-25,000	90-120	45-60	5-10	♦♦	♦	♦♦	♦♦	♦♦♦	♦♦♦♦
Oats (greenfeed)	Annual	25,000-33,000	90-120	45-60	5-10	♦♦	♦	♦♦	♦♦	♦♦♦	♦♦♦♦
Wheat (greenfeed)	Annual	18,000-25,000	140-160	70-80	5-10	♦♦	♦	♦♦	♦♦	♦♦♦	♦♦♦♦
Ryecorn (greenfeed)	Annual	-	120	60	5-10	♦♦	♦♦	♦♦	♦♦	♦♦♦♦	♦♦♦♦
Triticale (greenfeed)	Annual	19,000	110-170	55-85	5-10	♦♦	♦♦	♦♦	♦♦	♦♦♦	♦♦♦♦
Sorghum	Annual	24,000-37,000	25-45	-	5	♦♦	♦	♦♦	♦	♦	♦♦♦
Maize (greenfeed)	Annual	2,500 - 4,400	100-150,000 seeds/ha	-	-	♦♦	♦	♦♦	♦	♦	♦♦♦♦
Millet (Japanese)	Annual	-	25-40	10	5	♦♦	♦	♦♦♦	♦♦♦	♦	♦♦♦♦

KEY

♦
Feed value: Low
Grazing tolerance: Poor/ no regrowth
Drought tolerance: Poor
Waterlogging tolerance: Poor/none
Frost tolerance: Poor/none
Silage potential: Poor/none

♦♦
Feed value: Moderate
Grazing tolerance: Moderate regrowth /requires lax grazing
Drought tolerance: Low
Waterlogging tolerance: Low
Frost tolerance: Moderate
Silage potential: Moderate

♦♦♦
Feed value: Good
Grazing tolerance: Requires rotational grazing
Drought tolerance: Moderate
Waterlogging tolerance: Moderate
Frost tolerance: Good
Silage potential: Good

♦♦♦
Feed value: High
Grazing tolerance: Tolerates set stocking
Drought tolerance: Good
Waterlogging tolerance: Good
Frost tolerance: High
Silage potential: High

APPENDIX

Endophyte tables

The following tables 1-5 have been approved by the New Zealand Plant Breeding and Research Association (NZPBRA) and provide an impartial overview of the insect control and animal safety of commercially available endophytes.

ENDOPHYTE INSECT CONTROL

Ratings on endophyte insect control in Tables 1-4 are indicative and may vary slightly between cultivars. If Argentine Stem Weevil or Black Beetle are present at sowing, an appropriate seed treatment is recommended to improve insect control during establishment. These ratings are based in part on glasshouse studies where plants are 100% infected with endophyte, whereas commercial seed must meet minimum standards of 70% of seeds infected.

Table 1 – Diploid Perennial Ryegrass*

Endophyte Brand	Argentine Stem Weevil	Pasture Mealy Bug	Black Beetle	Root Aphid	Porina	Grass Grub	Field Cricket
AR1	♦♦♦♦	♦♦♦♦	♦	-[2]	-	-	Not Tested
AR37	♦♦♦♦[1]	♦♦♦♦	♦♦♦	♦♦♦♦	♦♦♦	♦	Not Tested
CM142	Not Tested	Not Tested	Not Tested	♦♦♦♦	Not Tested	Not Tested	Not Tested
NEA2	♦♦♦	(♦♦♦♦)	♦♦♦	♦♦	Not Tested	-	Not Tested
NEA4	♦♦♦	(♦♦♦♦)	♦♦♦	♦♦	Not Tested	Not Tested	Not Tested
NEA12	(♦♦♦♦)[1]	Not Tested	(♦♦♦)	♦♦♦♦	(♦♦♦)	Not Tested	Not Tested
RGT18	(♦♦♦)[1]	Not Tested	(♦♦♦)	Not Tested	(♦♦♦)	Not Tested	Not Tested
Standard endophyte	♦♦♦♦	♦♦♦♦	♦♦♦	♦♦	♦	-	Not Tested
Without endophyte	-	-	-	-	-	-	Not Tested

Table 2 – Tetraploid Perennial Ryegrass*

Endophyte Brand	Argentine Stem Weevil	Pasture Mealy Bug	Black Beetle	Root Aphid	Porina	Grass Grub	Field Cricket
AR1	(♦♦♦)	(♦♦♦♦)	♦	-[2]	-	-	Not Tested
AR37	(♦♦♦)[1]	(♦♦♦♦)	♦♦♦	♦♦♦♦	(♦♦♦)	♦	Not Tested
CM142	Not Tested	Not Tested	Not Tested	♦♦♦♦	Not Tested	Not Tested	Not Tested
NEA2	♦♦	(♦♦♦♦)	♦♦♦	♦♦	Not Tested	-	Not Tested
Without endophyte	-	-	-	-	-	-	Not Tested

*These tables were compiled by the NZPBRA (correct as of print July 2025).

AR1, AR37 and MaxP endophytes are used under license from Grasslanz Technology Limited, AR37 and AR584 endophytes are protected under the New Zealand Plant Variety Rights Act 1987.

Table 3 – Diploid and Tetraploid Italian and Short Term (Hybrid) Ryegrass*

Endophyte Brand	Argentine Stem Weevil	Pasture Mealy Bug	Black Beetle	Root Aphid	Porina	Grass Grub	Field Cricket
AR1	♦♦	(♦♦♦♦)	♦	-	Not Tested	-	Not Tested
NEA	Not Tested	(♦♦♦♦)	♦♦♦	Not Tested	Not Tested	-	Not Tested
AR37	♦♦♦[1]	(♦♦♦♦)	♦♦♦	♦♦♦♦	Not Tested	-	Not Tested
NEA12	(♦♦♦)[1]	Not Tested	(♦♦♦)	♦♦♦♦	Not Tested	-	Not Tested
Without endophyte	-	-	-	-	-	-	Not Tested

Table 4 – Continental Tall Fescue*

Endophyte Brand	Argentine Stem Weevil	Pasture Mealy Bug	Black Beetle	Root Aphid	Porina	Grass Grub	Field Cricket
MaxP (AR584)	Not Tested	Not Tested	♦♦♦	(♦♦♦♦)	Not Tested	(♦♦)	♦♦♦
Without endophyte	-	-	-	-	-	-	-

KEY TO TABLES 1-4

– **No control**

♦ **Low level control:** Endophyte may provide a measurable effect, but is unlikely to give any practical control.

♦♦ **Moderate control:** Endophyte may provide some practical protection, with a low to moderate reduction in insect population.

♦♦♦ **Good control:** Endophyte markedly reduces insect damage under low to moderate insect pressures. Damage may still occur when insect pressure is high.

♦♦♦♦ **Very good control:** Endophyte consistently reduces insect populations and keeps pasture damage to low levels, even under high insect pressure.

( ) **Provisional result:** Further results needed to support the rating. Testing is ongoing.

NOTES ON TABLES 1-4

1 AR37, NEA12, RGT18 endophytes controls Argentine stem weevil larvae, but not adults. While larvae cause most damage to pastures, adults can damage emerging grass seedlings. In Argentine stem weevil prone areas it is recommended to use treated seed for all cultivars with novel endophyte.

2 AR1 plants are more susceptible to root aphid than plants without endophyte.

3 Active against black beetle adults and larvae.

*These tables were compiled by the NZPBRA (correct as of print July 2025).

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ENDOPHYTE ANIMAL SAFETY

PGG Wrightson Seeds partners with AgResearch to ensure extensive animal safety testing is completed on each ryegrass and endophyte combination. Testing includes laboratory measurements and grazing trials completed under careful supervision and strict animal ethic standards. This standard of testing ensures that each endophyte is thoroughly understood prior to commercial use on farm.

The information in Table 5 is based on animal safety trialling protocols designed to expose animals to simulated worst-case scenario management. This involves forcing them to graze deep into the base of pure perennial ryegrass pastures that have been allowed to grow for several weeks over late spring/summer (similar to a hay crop), where they will encounter the highest concentrations of harmful endophyte chemicals if these are present.

This management does not represent normal farm practice, although similar situations may arise on farms in rare circumstances. Under normal farm grazing practices, the contribution of basal pasture material to total animal dry matter intake is relatively low, and therefore the intake of harmful chemicals (if they are present) is diluted. Thus, the likelihood of adverse effects on animals is reduced, but the potential for problems to occur may still exist if the endophyte brand is rated less than 4-star for 'freedom from staggers' and/or there are comments on animal performance that flag potential issues.

Comments on animal performance have been moderated based on information from other trials (in addition to the formal animal safety testing protocols), consideration of the 'normal' grazing management practices implemented on farm (see previous paragraph) and recognition that animal diets are very seldom pure ryegrass. Other dietary components such as clovers or non-ryegrass grass species, crops or supplements will dilute the intake of endophyte alkaloids.

Table 5 – Endophyte Animal Safety (Ryegrass, Festulolium and Continental Tall Fescue)

	Freedom from staggers		
Endophyte Brand	**Sheep and lambs**	**Cattle and dairy cows**	**Effects on animal performance**
AR1	♦♦♦♦	♦♦♦♦	High level of animal performance
AR37	♦♦♦	♦♦♦♦	Typically provides a high level of animal performance. Can cause ryegrass staggers in sheep and lambs in extreme circumstances. Lamb liveweight gain can be reduced during periods of severe staggers. While ryegrass staggers has not been observed in cattle and dairy cows, it could occur on rare occasions.
CM142	(♦♦♦♦)	♦♦♦♦	Typically provides a high level of animal performance. Can cause ryegrass staggers in sheep and lambs in extreme circumstances. Lamb liveweight gain can be reduced during periods of severe staggers. While ryegrass staggers has not been observed in cattle and dairy cows, it could occur on rare occasions.
NEA	♦♦♦♦	♦♦♦♦	High level of animal performance
NEA2	♦♦♦♦	♦♦♦♦	Typically provides a high level of animal performance. Lamb liveweight gain could be reduced in extreme circumstances. While no effects have been observed in cattle and dairy cows, body temperature could be elevated on rare occasions.
NEA4	♦♦♦♦	♦♦♦♦	Typically provides a high level of animal performance. Lamb liveweight gain could be reduced in extreme circumstances. While no effects have been observed in cattle and dairy cows, body temperature could be elevated on rare occasions.
NEA12	♦♦♦	♦♦♦♦	Typically provides a high level of animal performance. Can cause ryegrass staggers in sheep and lambs in extreme circumstances. Lamb liveweight gain can be reduced during periods of severe staggers. While ryegrass staggers has not been observed in cattle and dairy cows, it could occur on rare occasions.
RGT18	(♦♦♦♦)	♦♦♦♦	Typically provides a high level of animal performance. Can cause ryegrass staggers in sheep and lambs in extreme circumstances. Lamb liveweight gain can be reduced during periods of severe staggers. While ryegrass staggers has not been observed in cattle and dairy cows, it could occur on rare occasions.
U2	♦♦♦♦	♦♦♦♦	High level of animal performance
MaxP (AR584)	♦♦♦♦	♦♦♦♦	High level of animal performance
Standard endophyte	♦	♦♦	Can cause ryegrass staggers in sheep and lambs, and significantly decrease lamb growth rates in summer and autumn, and significantly increase dags. In dairy cows, it has been shown to depress milksolids production through summer and autumn.
Without endophyte	♦♦♦♦	♦♦♦♦	High level of animal performance

KEY TO TABLE 5

- ♦ Likely to cause severe staggers in most years
- ♦♦ Can cause severe staggers in some years
- ♦♦♦ Can cause severe staggers occasionally
- ♦♦♦♦ Very unlikely to cause staggers
- ( ) Provisional result: Further results needed to support the rating. Testing is ongoing.

NB - All trialling for ryegrass staggers occurs under simulated worst case scenario management and does not represent normal farm practice.

It is not advisable to mix AR37 and AR1 varieties. AR1 is not recommended for areas where black beetle, porina or root aphid are common problem pests. AR37 is only suitable for sheep and cattle and not advised for deer or horses.

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Supported by a team of technical experts

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