THE NATURAL ADVANTAGE

Sustainable, profitable pasture.

SEED OPTIONS SPRING 2019

"GRAZING PASTURE IS NATURAL – ANIMALS HAVE DONE IT FOR MILLIONS OF YEARS. AND WHILE ARTIFICIALLY 'BUILT' FOODS COME AND GO, NATURAL FOOD WILL ALWAYS BE THE MOST SOUGHT-AFTER."

Grazing comes naturally to cows – after all, they've done it for thousands of years. And our systems have evolved to maximise this natural advantage, and are continuing to evolve as consumers and society set new benchmarks and expectations.

Can we keep our low-cost base, maintain or increase profitability and still reduce our environmental footprint, using pasture? We believe the answer is most definitely yes. You'll find out why we are so positive about this – and how to use our products and information to help achieve it – in this booklet.

MANAGE & MITIGATE WITH PASTURE

Every farm is unique, and that means every N loss mitigation plan is unique, too. Strategies that work for your system may not work for your neighbour, and vice versa. When it comes to pastures, however, science has shown us even small changes can make a big difference.

• **Grow in winter.** With the wet winter-spring period the main risk time for N leaching, the more winter growth in your system, the more soil N you take up. Modern plant breeding has helped greatly in this - today's perennial ryegrasses grow 20-30% more winter DM than their 20-year-old predecessors. If you really want to soak up even more N in winter, sow the highest yielding Italian ryegrass.

• **Cover up.** Nothing loses soil N in winter like bare ground. Post autumn fodder beet, for example, sow cool season oats or Italian/annual ryegrass to catch the remaining N before it may leach in winter. Don't wait til the whole paddock is bare – sow half as soon as the crop is grazed. Earlier sowing gives much better yield and N uptake.

High yielding Italian soaks up N.

Cool season plantain reduces N leaching.

• **Min till.** It means more careful weed and pest control, but establishing new pasture through minimum tillage releases less N than cultivation. Long term it is better for your soil structure too.

• **Mix it up.** Deep rooted plantain is known to mitigate N leaching. Cool-season active plantain is even better - more feed when you need it most, and more growth when the risk of N loss is highest.

• **Break later.** Use 24 hour grazing to give the cows a new paddock in the afternoon. Ryegrass carbohydrate levels are highest and protein levels are lowest in the late afternoon, so there's less N going in to the cows. 24 hour grazing has no effect on cow production over 12 hour grazing (and is easier with half as many stock shifting decisions too!)

24 hour grazing's better for the environment.

• **Graze higher.** When ryegrass tillers have 3 leaves, water soluble carbohydrate goes up and protein (i.e. N) goes down. Grazing at the 3 leaf stage means less N comes out of your cows. Mixed diploid/tetraploid pastures are easiest to manage this way.

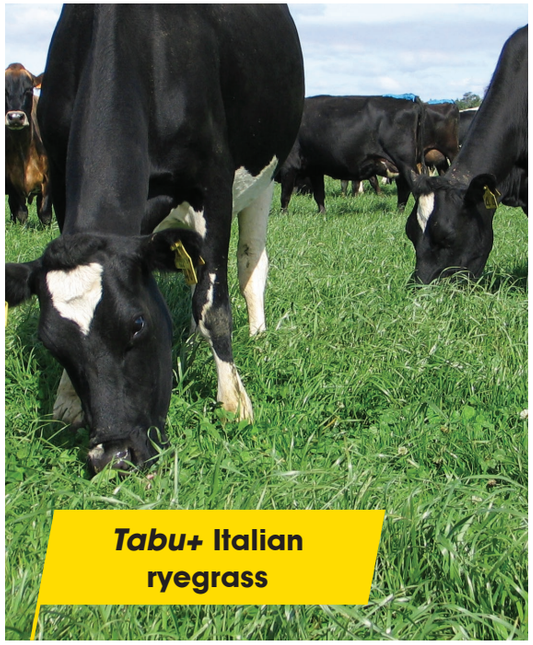
Clover fixes 25-30 kg N per tonne DM.

• **Utilise more.** Raising per cow intake and MS production with tetraploid ryegrass and optimal grazing management can give the same total MS yield from fewer cows. This means more feed going into milk, less into cow maintenance, and a lighter environmental footprint. An added benefit is that fewer heifers are needed.

• **Fix for free.** Legume-rich pastures need less artificial N fertiliser and are a more efficient use of nitrogen. Use high performance red and white clovers, as they fix 25-30 kg atmospheric N/ha for every tonne of DM grown.

PASTURES FIT FOR PURPOSE

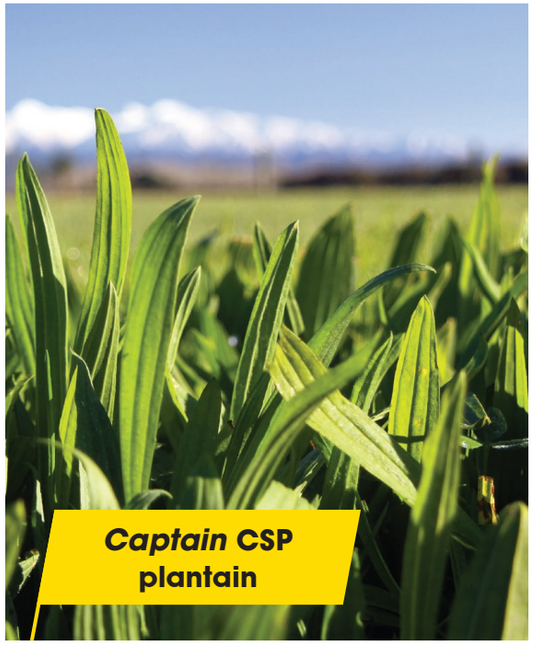
Our most recent cultivars are purpose-bred for new and emerging pasture systems that balance productivity with sustainability.



Tabu+ Italian ryegrass

More winter growth = more N capture. Tabu+ is the only 5 Star cultivar in DairyNZ FVI Winter Feed list.

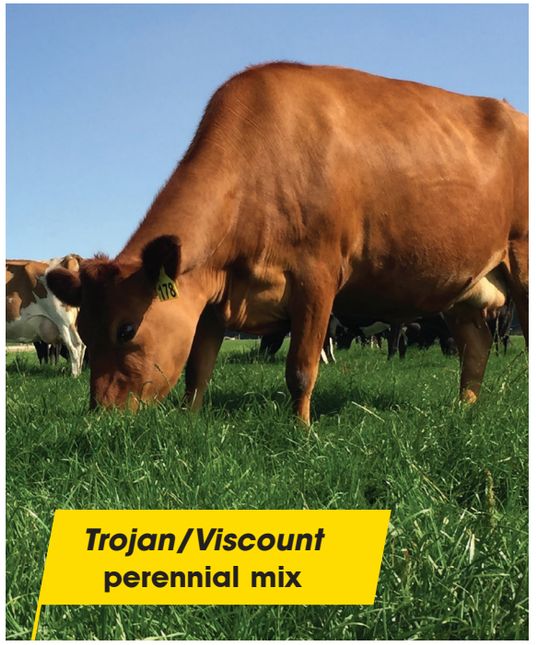
The more winter growth in your system, the more N you capture before it leaves the soil. *Tabu+* hits its peak when the risk of N leaching is highest, typically from May to August. Its super-fast cool season growth pulls up more N than slow growing plants. As the only nationwide 5 Star cultivar in the DairyNZ FVI Winter Feed category, *Tabu+* is in a class of its own.



Captain CSP plantain

We bred this cool season plantain for when most N is lost, through winter.

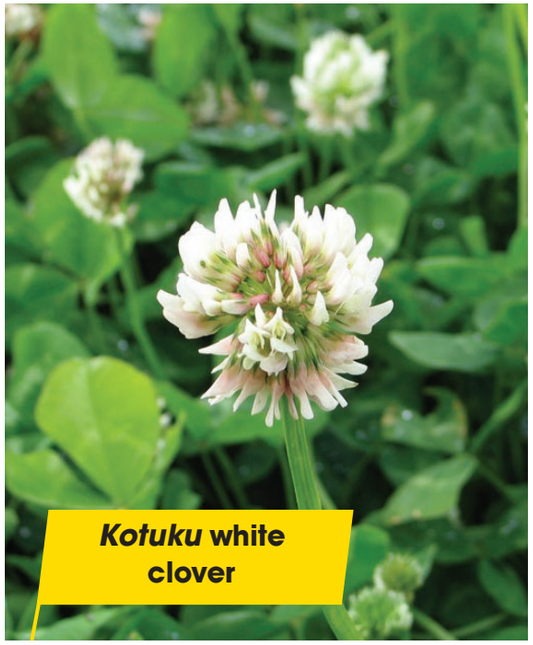
Captain CSP (cool season plantain) was bred for high cool season growth, providing more kg DM/ha when feed is needed most, and utilising soil N in winter, the highest risk time for N leaching. Deep and extensively rooted, it's high in minerals, with good yield and ME year round. *Captain CSP* suits all dairy farm systems.



Trojan/Viscount perennial mix

High palatability = higher pre-grazing covers, reducing cow N intake.

Trojan is a great perennial ryegrass, but when you add tetraploid *Viscount,* palatability lifts, and you can run higher pre-grazing covers. This reduces N leaching, because tillers with 3 leaves contain less crude protein than those with 2. This mix can also raise cow intakes, allowing you to reduce stocking rate, with associated environmental benefits.



Kotuku white clover

More efficient N fertiliser use means greater reliance on legumes, and Kotuku is a star performer.

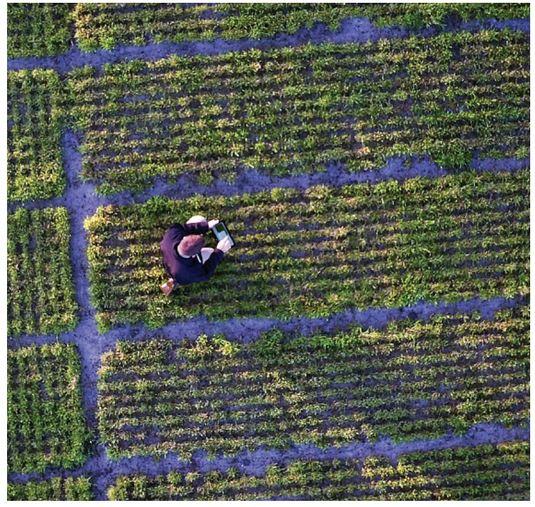
Kotuku is a new high performance, large leaved white clover for dairy and heifer systems. It is very high yielding, with superior summer growth which means greater N fixation into pastures. It also has good persistence, and is an important source of ME. Per kg DM white clover produces 30% more milksolids than grass.

FUTURE PROOFING

It's an exciting time to be a plant breeder. Our team is using new techniques to develop pastures that will fuel NZ's farm systems through to 2030 and beyond. But we're also sticking to tried and true processes that have served us well for many years.

• Pressure testing. Every year we cross different lines of ryegrass to create hundreds of potential new pasture cultivars. People often assume we look after these in the field. We don't. Second generation crosses are planted close together, grazed and left to fend for themselves with minimal inputs.

We don't water unless we have to. And critically, N fertiliser is not applied unless absolutely necessary. Only plants that thrive under this stress go through to the next stage of development. All plants look great when the conditions are good - we need to breed for when the pressure is on so they can handle what they may need to on-farm.



• DNA markers. Genomic selection tools have already improved dairy breeding in NZ. Now the same technology is being introduced to plant breeding. Using genomics for more efficient plant selection is expected to accelerate the current rate of genetic gain in ryegrass DM yield, from about 0.7% per year to 2%. And increased confidence provided by genomics could eliminate some of the many cross-breeding and selection cycles currently required to achieve improved plant performance, allowing us to bring new cultivars to market sooner.

• More for less H_2O. Research is showing large variations in water use efficiency between ryegrass plants. Some simply grow more DM, using less water to do it. These elite plants are coming through the Barenbrug Agriseeds breeding programme with the goal of helping farm systems become more efficient, or enabling them to grow more during periods of moisture stress or water restrictions.

• Lower protein, reduced N loss. Genomic selection allows us to economically assess large numbers of plants for traits that previously have been cost prohibitive to identify. Plants which contain lower crude protein (CP) and have a better improved protein:carbohydrate balance, are a great example. While CP feed requirements are typically >18% for lactating animals, >15% for growing animals or >12% for maintenance fed animals, for most of the year NZ pastures often contain over 20%. The N in this excess CP (above animal requirements) can be excreted in urine, into concentrated patches on the soil, which increases the risk of N leaching. More balanced pasture, with lower CP, will better match stock requirements, and reduce the amount of excess CP and N in our farm systems.

SOWING THE FUTURE – RYEGRASSES

There is no one perfect ryegrass. Picking the right cultivars is about finding the best fit for your farm system, balancing fast growth with robustness.

The 2-3 year rocket, with amazing yield and palatability.

Shogun is the tetraploid hybrid that provides maximum productivity for a 2-3 year pasture. It's very fast establishing so ideal for minimum tillage options, such as undersowing or spray-drilling. NZ's top selling hybrid ryegrass has outstanding year-round yield, and is available with *NEA* or *LE* endophyte options. See page 15 for *Shogun* seed mixes.

Turn your cows into pigs – the very palatable grass animals love to graze.

Viscount is a top performing tetraploid perennial ryegrass, which improves cow intakes and makes management easy. But straight tetraploids aren't for everyone, and most commonly we mix *Viscount* with *Trojan* for the near ultimate balance of yield and palatability. Available with *NEA4* or *LE* endophyte options. See page 14 for *Viscount* seed mixes.

Proven performance, with over quarter of a million ha planted across the country.

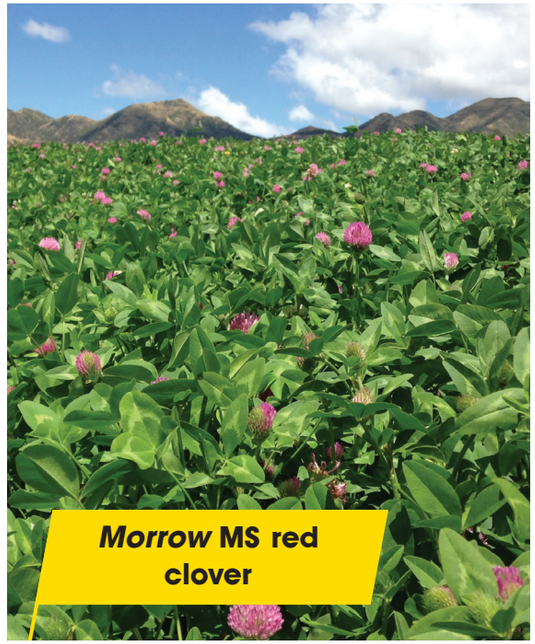
Trojan is a robust, high performance diploid perennial ryegrass that's proven itself over the last 8 years. It's our top selling perennial with high ME, with great animal health. It is late flowering, and is a top ranking diploid ryegrass in the DairyNZ FVI. Available with *NEA2* or *LE* endophyte options. See page 14 for *Trojan* seed mixes.

Dense, robust all-rounder with an advantage on wetter, heavier soils.

Governor is a very persistent perennial ryegrass, finer and denser than *Trojan,* which can be a significant advantage in helping protect soils where treading and pugging are a concern. It is early heading with excellent yield on the shoulders of the season. Available with *AR37, AR1* or *LE* endophyte options. See page 14 for *Governor* seed mixes.

SOWING THE FUTURE – OTHER OPTIONS

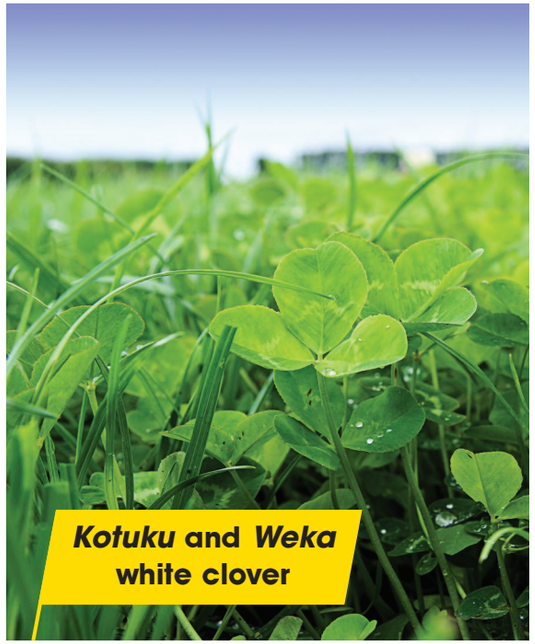
Other recent cultivars that can be used in new and emerging farm systems. Legumes will be particularly important in these systems.



Morrow MS red clover

New multi stemmed (MS) red clover with better grazing tolerance.

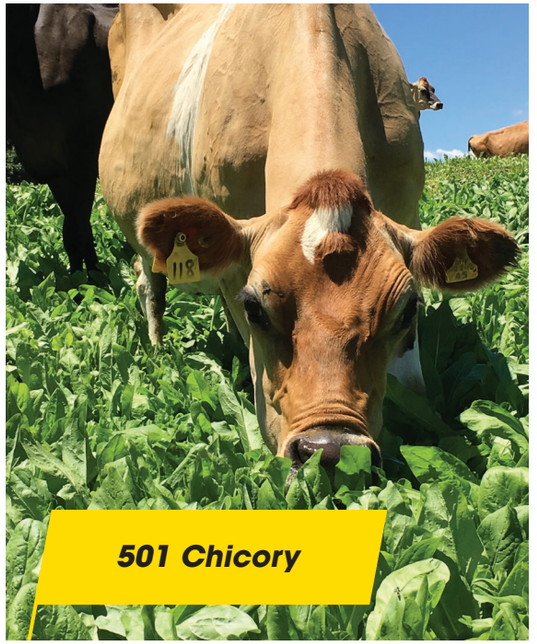
Morrow offers outstanding feed quality, through late spring to autumn, particularly in dry conditions with its deep tap root. Resistant to clover root weevil. While *Morrow* has better persistence, it lasts best under longer summer rotations and lower stocking rates. See page 14 and 15 for seed mixes.



Kotuku and _Weka_ white clover

The team providing high clover yields, reducing reliance on fertiliser N.

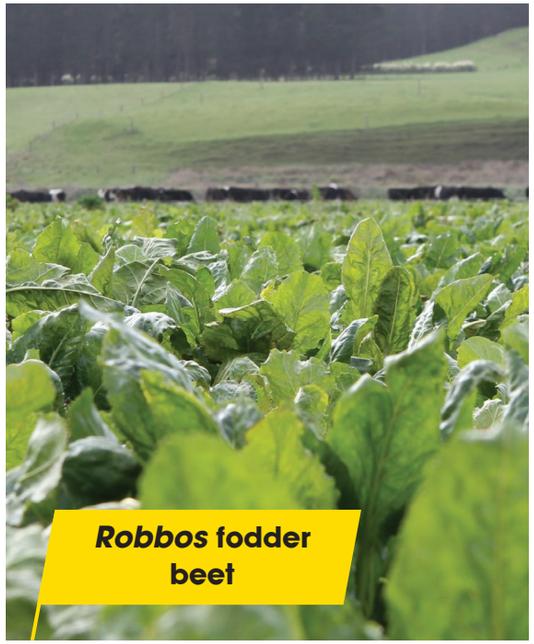
Kotuku is a very high yielding large leaved clover, with extra summer yield. *Weka* is medium leaved, very good at spreading through a pasture. Together this combination provides a high clover content across a wide range of conditions. See page 14 and 15 for *Kotuku* & *Weka* seed mixes.



501 Chicory

Multi-graze summer forage – provides protein & ME in summer dry areas.

501 Chicory can provide 5-9 t DM/ha more than an old pasture, with significantly higher feed value, in summer dry systems. Environmental benefits include no need for insecticides and improved soil structure. Research shows it can increase urination frequency, potentially reducing N leaching.



Robbos fodder beet

Proven high yield, with more protein - meaning better animal nutrition.

A medium DM% beet with very high yield, excellent palatability, and can be grazed or lifted. *Robbos* has excellent leaf holding ability, and high protein (test results 24.5%). This could save 4.5t DM/ha quality silage needing to be fed for a balanced diet (value $350/ha at $0.40/kgDM) over some other cultivars.

PASTURE MIX OPTIONS

Pasture, like farming, is ever evolving. Below we have listed some pasture mixes for different systems along with additional pasture options that can lift their value, both financially through increased yield and quality, and environmentally.

STANDARD

Perennial ryegrass - High performance dairy

Standard mix

Cultivars	kg/ha
Trojan perennial ryegrass	20-22
Kotuku white clover	2
Weka white clover	2
Total	**24-26**

- *Trojan* for very high seasonal & total DM yield
- Robust pasture for high MS production
- *NEA2* or *Low* endophyte ryegrass to maximise animal performance

Perennial ryegrass - General purpose

Standard mix

Cultivars	kg/ha
Governor perennial ryegrass	18-22
Kotuku white clover	2
Weka white clover	2
Total	**22-26**

- Densely tillered, persistent, all-round mix
- High ground coverage advantage against treading damage on wet soils
- *AR1*, *AR37* or *Low* endophyte options

Hybrid ryegrass

Standard mix

Cultivars	kg/ha
Shogun hybrid ryegrass	30
Kotuku white clover	2
Weka white clover	2
Total	**34**

- High performance 2-4 year tetraploid pasture
- Extremely high yield across all seasons
- *NEA* or *Low* endophyte ryegrass to maximise animal performance

Italian ryegrass

Standard mix

Cultivars	kg/ha
Tabu+ Italian ryegrass	20
Total	**20**

- High performance 1-2 year pasture
- *Tabu*+ fast establishing with rapid regrowth

NEXT GENERATION

Next generation mix

Cultivars	kg/ha
Trojan perennial ryegrass	10
Viscount perennial ryegrass	15
Kotuku white clover	2
Weka white clover	2
Captain CSP plantain	2
Total	**31**

- *Viscount* improves palatability, for easier grazing
- Diploid: tetraploid ryegrass combination gives robustness (over pure tetraploid pasture)
- *Captain* reduces N leaching & increases mineral content

Next generation mix

Cultivars	kg/ha
Governor perennial ryegrass	18-20
Weka white clover	2
Apex white clover	2
Captain CSP plantain	2
Morrow red clover	5
Total	**29-31**

- Reduced N leaching with *Captain* plantain
- Increased mineral content for animal health benefits
- *Morrow* adds late spring & summer quality, plus extra N fixation

Next generation mix

Cultivars	kg/ha
Shogun hybrid ryegrass	28
Kotuku white clover	2
Weka white clover	2
Morrow red clover (coated)	6
Total	**38**

- *Morrow* adds late spring to autumn feed quality
- Extra N fixation from all clovers

Next generation mix

Cultivars	kg/ha
Tabu+ Italian ryegrass	20
Kotuku white clover	2
Morrow red clover (coated)	6
Total	**28**

- *Morrow* adds late spring to autumn feed quality
- Extra N fixation from both *Kotuku* and *Morrow*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