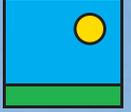


agriseeds
superior pastures



PERMANENT PASTURES
FOR SUMMER DRY
SHEEP & BEEF FARMS

Achieving long-term productive pasture

In summer dry areas, investing in permanent pasture requires both good planning and attention to detail. Success comes from:

- Matching the right pasture species and cultivar (and if applicable ryegrass endophyte) to your climate, soil and requirements;
- Having the right pasture management plan, and;
- Setting up flexible plans and policies to handle what can be highly variable seasons.

There is no 'silver bullet' solution to achieving long-term productive pasture. But these solid, well-founded principles will help you greatly to succeed. You'll find details in this booklet.

This booklet focuses on permanent pastures in the red box in the table below. For information on finishing options order the 'Sheep & Beef Finishing Pastures' booklet from www.agriseeds.co.nz

Pasture type	Short term finishing pasture	2-4 year finishing pasture	High yield, persistent pasture	Persistence key requirement	Toughest, non-ryegrass situations
Cultivars	<i>Hogan</i> <i>Tabu</i> <i>501 Chicory</i> <i>Interval</i>	<i>Shogun</i> <i>Bealey</i> <i>Tuscan</i>	<i>Trojan</i> <i>Alto</i>	<i>Rohan SPR</i>	<i>Bareno</i> <i>Safin</i>
Description	High performance ryegrass or crops.	High performance tetraploid ryegrass or red clover, best suited for specialist finishing pastures.	Excellent balance of high DM yield and very good persistence, to suit many situations.	<i>Rohan SPR</i> takes things a step further, as a very persistent ryegrass suited to tougher conditions.	Some situations are too tough or dry for ryegrass. This is where <i>Bareno</i> pasture brome and <i>Safin</i> cocksfoot suit.

Increasing persistence →

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ROHANSPR^{NEA2}

SPREADING PERENNIAL RYEGRASS

In brief: *Rohan* spreading perennial ryegrass (*SPR*) is as tough a ryegrass as we can currently develop, specifically bred to give sheep and beef farmers persistent, palatable and easy-care pasture. It has a unique spreading ability, very fine leaves and a dense habit. *Rohan SPR* has *NEA2* endophyte for good animal performance.

Spreading ryegrass

Rohan SPR's ability to spread along the ground provides key benefits. First, it helps *Rohan SPR* fill bare areas in a pasture, areas that may otherwise be occupied by weeds as shown in the photo below. This means *Rohan SPR* competes more aggressively against weed ingress.

Second, *Rohan SPR*'s spreading habit helps pastures recover from adverse climatic events, particularly extended dry periods, because it spreads to fill space where ryegrass tillers may have died.

Rohan SPR is not indestructible. Like all ryegrasses it performs best under reasonable management and soil fertility. But its spreading habit does improve its persistence compared to other ryegrass cultivars.



Rohan sends out stolons or runners to help its persistence.

'Easy care'

Under many semi-intensive to semi-extensive farm systems it can be hard to maintain pasture quality in late spring.

A continual comment from farmers growing *Rohan SPR* is that it 'always looks good'. It stays greener and leafier and is often preferentially grazed. In farm trials *Rohan SPR* has higher ME (+0.7 MJ) than some other cultivars in November and December. It is late heading (+18 days).

NEA2 endophyte

Rohan SPR with *NEA2* endophyte provides good animal performance; very low staggers risk pasture for sheep, and staggers-free grazing for cattle.

Typical seed mix

Cultivars	kg/ha
<i>Rohan SPR</i>	16-20
<i>Weka</i> white clover	2
<i>Apex</i> white clover	2
<i>Safin</i> cocksfoot	2-3
(Sub clover can be added)	(8-10)
Total	22-27

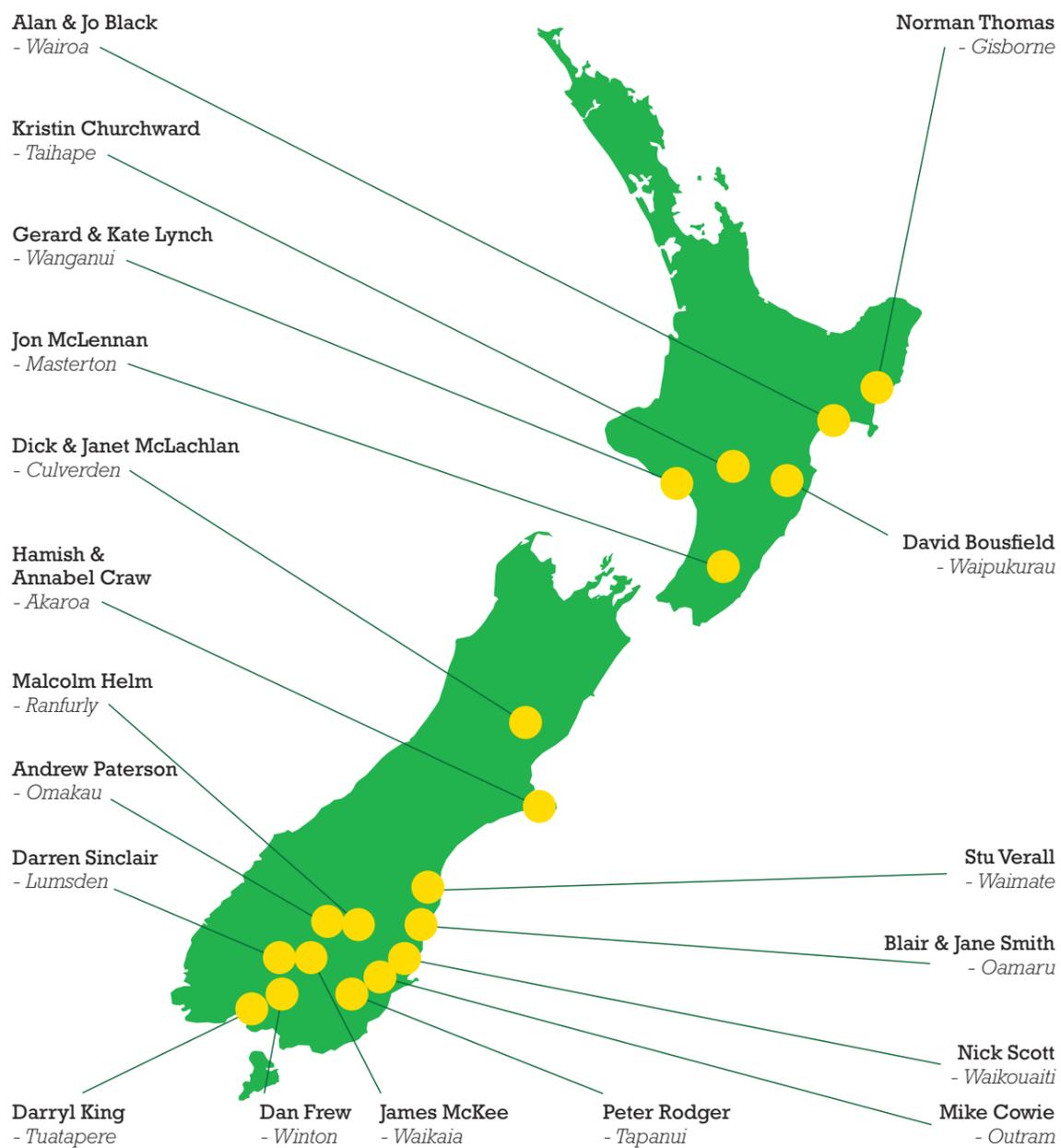


Rohan SPR stays leafier and shows a +0.7 ME advantage late spring on farm.



In brief: The *Rohan* Challenge seeks to improve ryegrass persistence on New Zealand sheep and beef farms. We are working with 19 farmers through the country to find practical solutions.

Follow these farmers and their experiences as they put theory into practice to achieve more persistent pastures on their properties.



TROJAN^{NEA2}

PERENNIAL RYEGRASS

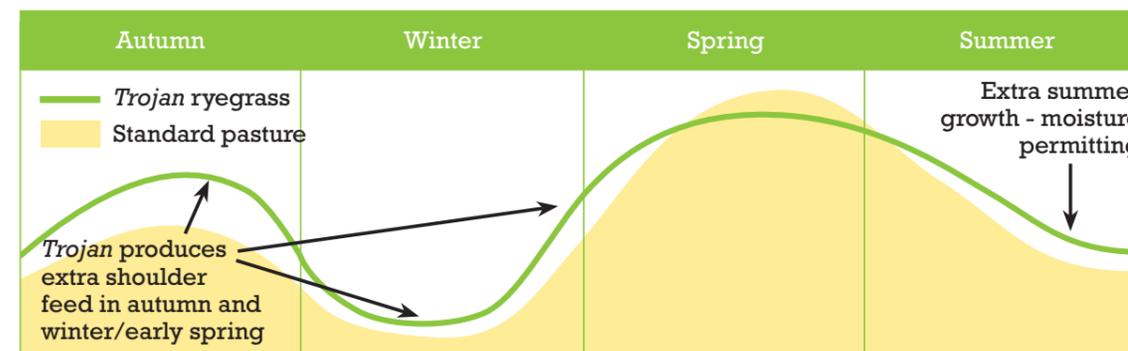
In brief: *Trojan* suits slightly better country than *Rohan SPR*, where it can express its exceptional DM yield, and strong shoulder growth in both winter/early spring and autumn. This diploid ryegrass has excellent persistence and high feed quality; is late heading (+16 days) and comes with *NEA2* endophyte for good animal performance.

Top seller

Trojan is New Zealand's top selling ryegrass, unsurprising considering its balance of features: exceptional DM yield across all seasons; excellent persistence; *NEA2* endophyte for good animal health and insect control (including black beetle); high feed quality, and good resistance to rust and plant pulling.

DM yield

Trojan NEA2 sets the standard of DM yield for diploid ryegrass, but more important is the consistent way it produces this yield at the shoulders of the season.



Trojan's total DM yield potential is about 10% higher than *Rohan*, and this is expressed on better soils with higher fertility.

NEA2 endophyte

Trojan with *NEA2* endophyte provides good animal performance; very low staggers risk pasture for sheep and staggers-free grazing for cattle.

Typical seed mix

Cultivars	kg/ha
<i>Trojan</i> perennial ryegrass	16-20
<i>Weka</i> white clover	2
<i>Apex</i> white clover	2
<i>Safin</i> cocksfoot	2-3
Total	22-27

ALTO^{AR1}

PERENNIAL RYEGRASS

In brief: *Alto* is fine leaved and robust with good year round growth. It is late heading (+16 days) and is available with *AR37* endophyte for better tolerance to porina.

Proven performance

Alto ryegrass has been marketed for 10 years and has a proven record as a high performance, persistent cultivar. It is densely tillered (although not as densely tillered as *Rohan SPR*).

Porina

AR37 is the only endophyte to give ryegrass pastures a level of porina protection so *Alto* should be sown with this endophyte where porina is a major issue.

Alto AR37 pastures must still be monitored for porina and sprayed on occasion for persistence, but need less spraying than non-*AR37* pastures. Other steps in an integrated plan to control porina include:

- Maintain lower pasture cover during late spring to reduce survival of eggs and young larvae. Paddocks left for hay or silage, or poorly grazed and rank, are typically worst affected.
- Use insecticides where necessary. Insect growth regulators (IGRs) should be applied late January to early March. Organo-phosphate and synthetic pyrethroids can be used later, in which case digging in April will give a good guide to numbers. If possible apply insecticide to short pasture.
- Mob stocking in summer can give porina control. Intensively graze pasture to 20-30 mm using high stocking rates (1000 ewes/ha) over a few days.

AR37 animal health

Lamb LWG on ryegrass containing *AR37* is generally good, although it may be reduced in periods of severe ryegrass staggers that can sometimes occur on *AR37*. Staggers is less likely to occur on *AR37* than on the old standard (or 'high') endophyte.

AR37 must not be used for horses or deer because of animal health issues.

Typical seed mix

Cultivars	kg/ha
<i>Alto</i> perennial ryegrass	16-20
<i>Weka</i> white clover	2
<i>Apex</i> white clover	2
<i>Safin</i> cocksfoot	2-3
Total	22-27

ESTABLISHING RYEGRASS WELL

In brief: Establishment makes or breaks future pasture performance. There are many good old pastures found on farms, and one key reason they persist is because they were well established. Good pasture establishment is like a chain – only as strong as the weakest link. Use this checklist to make sure every link in the chain is strong.

✓	Checklist
	<p>Look at the class of country being developed What is the soil type, soil fertility and moisture availability? Generally better country gives better returns (and is least costly) to renew. On harder country cropping before sowing permanent pasture works well to develop soil structure and control weeds.</p>
	<p>Identify reasons for current poor performance If a previous pasture has failed find out why so you can avoid it happening again. Typically on farms some pastures last well, others don't: why might this be happening?</p>
	<p>Test & correct soil fertility</p>
	<p>Choose appropriate renewal method Renewal paddocks can be built into a cropping programme, for example – a break crop as well as providing extra feed, reduces pests, weeds and any thatch issues.</p>
	<p>If relying on a contractor, book in early</p>
	<p>Check for pests (e.g. grass grub, slugs and ASW) These are particularly an issue if direct-drilling, and can be controlled by seed treatment, insecticide and/or slug bait as required.</p>
	<p>Spray out paddock prior to cultivation or direct drilling This is a good investment and gives much better weed control.</p>
	<p>If cultivating, prepare a fine, firm seed bed Consolidation is important to save moisture and allow good depth control with seed drills - ryegrass and clover seed are small and need shallow sowing.</p>
	<p>Choose correct cultivar and seed mix for the farm system There is good information in this booklet to match cultivars with the situation, to get long term pasture performance.</p>
	<p>Spray weeds in early establishment Broadleaf herbicide either before or after first grazing is usually a good investment.</p>
	<p>Graze early to promote tillering The first grazing is not a 'feed' but a nip off to encourage tillering and density. Use a 'pluck test' to determine when pasture is ready for first grazing.</p>
	<p>Avoid pugging when soil is soft</p>

SEASONAL MANAGEMENT PLAN

In brief: The secret to pasture persistence is understanding the way pastures grow, the challenges that damage them, and how to manage for these. While we can't change the weather, we can adapt management according to how each season unfolds. This has a huge effect on persistence, and in turn the farm's ability to bounce back from dry summers.

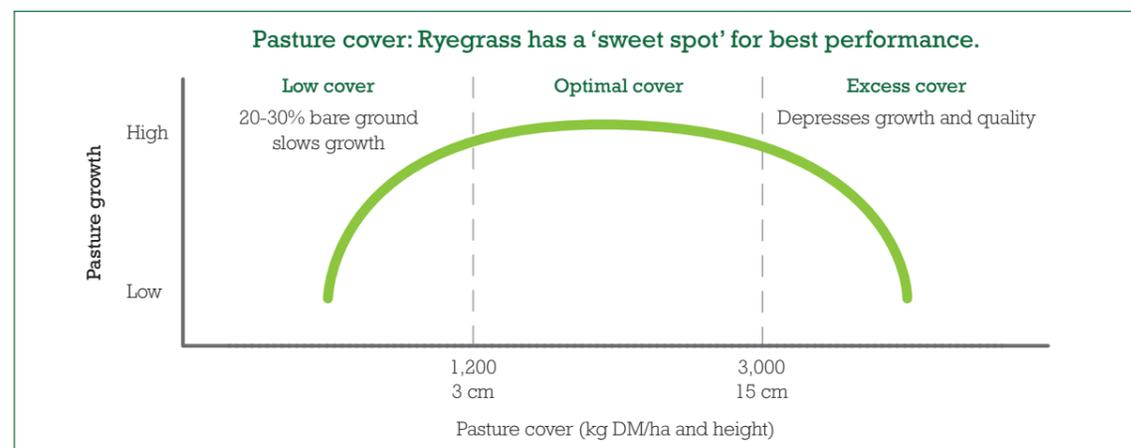
Spring challenges

- Keep pasture in the right grazing window
- Deal with any feed surplus to maintain feed quality
- Prepare for a dry season, just in case.

Strong, healthy ryegrass plants will survive dry conditions better than those which are weak. So the aim for spring pasture management is to have robust, well grown plants prior to (a possibly dry) summer.

For perennial ryegrass, management through spring is particularly important, because plants change from vegetative to reproductive (when they produce seedheads) and back to vegetative again at this time, and are vulnerable to stress during this process. Production of new ryegrass tillers is highest during mid-spring, and again immediately post-flowering in early summer, and survival of these new tillers (called daughter tillers) is paramount for persistence.

During this period pastures grow and tiller best when kept in the right 'grazing window', i.e. keep covers between 1000-3000 kg DM/ha. Undergrazing and letting pasture get too long or making heavy crops of baleage or silage (>3000 kg DM/ha) leads to poorer pasture quality. More important, it can result in more open pastures with fewer daughter tillers, making them more vulnerable to future stress.



Similarly overgrazing (<1000 kg DM/ha) greatly slows pasture growth and can weaken plants. This is because grazing to this level penetrates the base of the pasture, where ryegrass plants store the energy they need for growth and survival.

Maintaining ryegrass pastures in the optimal grazing window of 1000-3000 kg DM/ha helps meet the nutritional needs of the animals, maximises pasture growth, and helps set up strong ryegrass pastures, before a potentially dry summer.

As late spring is usually a period of surplus pasture growth, strategies to help in achieving good grazing include removing paddocks from grazing to sow crop; making baleage or silage or hay; mowing pasture pre or post grazing or purchasing extra stock.

Summer challenges

- Avoiding overgrazing
- Increasing feed supply or reducing demand.

Short periods of moisture stress are common. The main problem for ryegrass persistence is extended dry periods which might last for several months. During these, growth is limited, and your pasture management focus is simple: maintain a strong pasture which will survive and re-grow once rain comes.

The biggest risk during extended dry periods is overgrazing, resulting from the tension between continued animal feed requirements and poor pasture growth. Overgrazing can kill plants and allow invasion of weeds, as plant reserves – which are necessary for survival through to autumn – are stored above the ground, in the bottom 3 cm of a pasture.

Make sure you have systems in place to avoid overgrazing, by limiting it to certain parts of the farm. The key tactic is on-off grazing, where animals are removed from the ryegrass paddock when the pasture has been grazed down to 3 cm in height. They might be put onto a crop, feed pad, crop stubble, low value pasture, or paddock(s) earmarked for renewal.

Farm policies to increase feed supply (e.g. supplements on-hand and summer crops) or decrease feed demand (e.g. selling trading stock, lambs store or culls) can be used to both feed animals and protect pastures from overgrazing through dry periods.



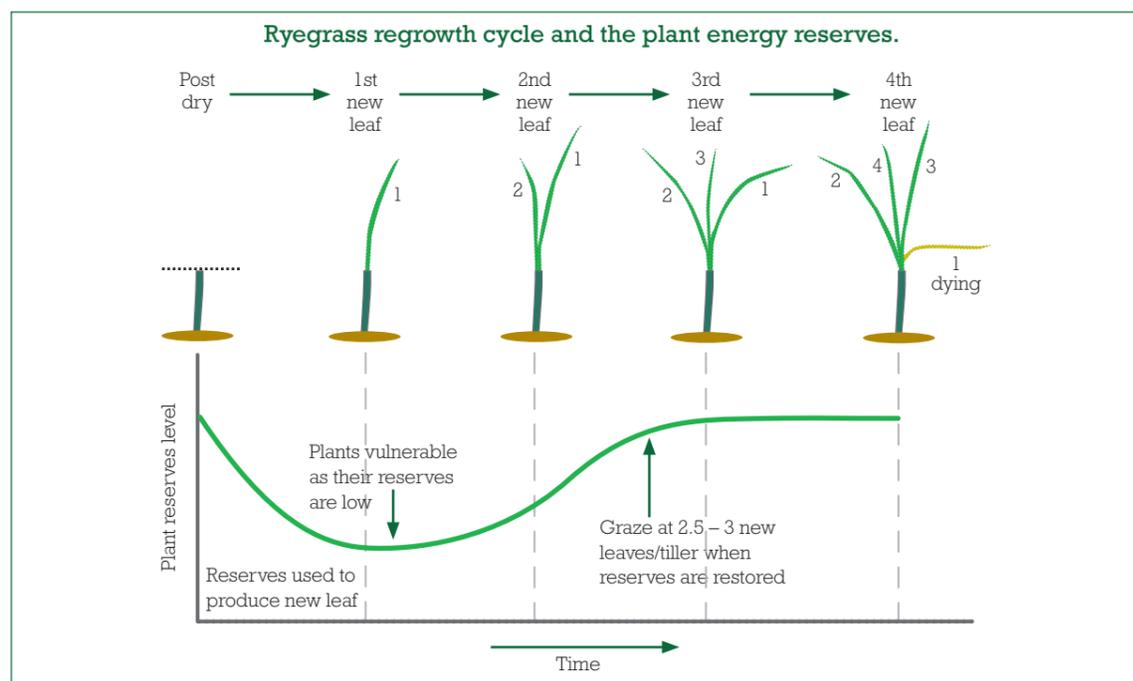
Large cultivar differences exist in persistence, seen here in different plots under trial in Hanmer Springs in May 2015, following the 2014/15 drought. However, avoiding overgrazing is key to getting the good cultivars to persist.

Autumn challenges

- Allow pastures to recover following any extended dry spell
- Manage insect attack
- Setting up for spring

Once pastures receive significant rainfall, they must be allowed to recover before grazing. Continue your dry weather management strategies while pastures slowly start growing again.

Ryegrass pastures should only be grazed when ryegrass plants have produced 2.5 - 3 leaves per tiller, when plant energy reserves are replenished for good re-growth as shown in the diagram below. Grazing the first 'pick' of green growth prior to this may weaken and kill recovering pastures.



If grass grub or porina are likely to be a problem apply insecticide early (during February/March). Mob stocking/heavy rolling when soil is damp can help to reduce grass grub population.

A key priority for autumn is setting up pastures for lambing and calving, given your likely winter growth. Late autumn nitrogen, particularly if applied over a large part of the farm, can be a very useful tool to break out of a low pasture cover and set the farm up for spring.

Winter priorities

- Avoid pugging damage
- Keep pasture cover on track for spring

Pugging by cattle can damage both your soil and pasture, and reduce annual pasture growth by $\geq 30\%$.

To maximise lamb growth rates through lambing, one key part is maintaining the right pasture cover to feed ewes and lambs well. In early spring "Grass grows grass" is the rule, and pasture and lamb growth is only 60% of its potential at 800 kgDM/ha; around 80% of its potential at 1000 kgDM/ha, and; needs to be >1500 kgDM/ha to maximise growth rates.

BARENO PASTURE BROME

In brief: *Bareno* pasture brome is a standout persistent pasture for summer dry free-draining soils in farm systems where ryegrass persists poorly. It is deep rooting and legume-friendly. *Bareno* can be rotationally grazed or set stocked.

Introduction

Different species of brome grasses are available in New Zealand, ranging from the short lived prairie grass (which is like the Italian ryegrass of bromes) through to the very persistent pasture brome. Bromes suit free draining soils of moderate fertility and low aluminium in summer dry areas. They do not persist well on poorly drained soils.

Management

Bareno is flexible in its management, and tolerates both rotational grazing and set stocking.

A strong feature is its palatability through all seasons, even when seed heads are present. This gives it a big advantage over cocksfoot or tall fescue which are unpalatable to stock when they have gone to seed.

Bareno is deeper rooting, and stays much greener and leafier than ryegrass in summer dry conditions. It can also support a high legume content - 40% sub and white clover has been measured in spring.

In dry summer conditions, *Bareno* pastures should not be bared out, although they will tolerate this better than ryegrass. Leaving pasture covers of 3-4 cm will ensure persistence and regrowth through summer. Remember the plant's reserves in grasses are above the ground, not in the roots.

The key to *Bareno* is getting good establishment, covered on page 16.

Performance

Bareno is high yielding, and on Lincoln University's Silverwood Farm, a dryland breeding property in inland Canterbury, produced 12.5 t DM/ha/year, 9% more than new sowings of perennial ryegrass (11.5 t DM/ha).

It has better late spring, summer and autumn growth than ryegrass, but is typically two - three weeks slower in early spring.

Typical seed mix

Cultivars	kg/ha
<i>Bareno</i> pasture brome	25-30
<i>Weka</i> white clover	2
<i>Apex</i> white clover	2
<i>Safin</i> cocksfoot	2-3
(Sub clover can be added)	(8-10)
Total	31-37

COCKSFOOT

In brief: *Safin* is an innovative super-fine leaved cocksfoot which looks almost as fine as ryegrass. A key feature is increased production in early spring, when DM growth is critical through lambing or calving for dryland systems.

Introduction

Cocksfoot is our most persistent grass, handling drought and moderate soil fertility well.

It can be used as part of a seed mix, where little shows up initially but content increases over time. Some traditional clumpy cocksfoot varieties spread and dominate pastures (e.g. *Wana*), reducing palatability, but super-fine leaved *Safin* does not do this.

Alternatively, cocksfoot can be sown as the main pasture grass on very dry soils.

Performance

A key feature of *Safin* is its improved growth in early spring for a cocksfoot. DM production is critical for this period for lambing or calving in dryland farming systems, so stock can be finished prior to potential summer dry conditions. *Safin* is noticeably faster to get away in spring, and over 12 months total DM production of *Safin* is very good.



Superfine *Safin* cocksfoot (right) almost looks like a ryegrass when compared to a traditional cocksfoot which can form unpalatable clumps in a pasture.

Pest tolerance

Once established *Safin* is tolerant to grass grub and Argentine stem weevil (ASW) attack. However, seedlings are susceptible at sowing and *AGRICOTE Grass* seed treatment is recommended where these pests are a risk.

Management

Cocksfoot has less feed value and palatability than ryegrass if it becomes long or rank, so it should be kept short and leafy through spring.

In grazing trials, animal performance is good where cocksfoot is kept leafy. Maintaining good legume content in cocksfoot pastures also improves animal performance.

Cocksfoot is more tolerant of low-moderate soil fertility than perennial ryegrass. However, it is very responsive to nitrogen fertiliser, generally at higher response rates than ryegrass, and this can be a very useful tool to promote growth, as well as improving feed value and protein content.

Typical seed mixes

<i>Safin</i> based pasture	kg/ha
<i>Safin</i> cocksfoot	8-10
<i>Weka</i> white clover	2
<i>Apex</i> white clover	2
(Sub clover can be added)	(8-10)
Total	12-14

<i>Safin</i> in ryegrass pasture	kg/ha
<i>Rohan SPR</i>	16-20
<i>Weka</i> white clover	2
<i>Apex</i> white clover	2
<i>Safin</i> cocksfoot	2-3
(Sub clover can be added)	(8-10)
Total	22-27

ESTABLISHING PASTURE BROME OR COCKSFOOT PASTURES

In brief: Pasture brome and cocksfoot are slower to establish than ryegrass, and need extra care to establish well to get good long term results.

Summer fallow

The most reliable – and recommended – way to establish these pastures is via a summer fallow. While you lose some potential summer feed in this process, you benefit from conserving soil moisture to give reliable establishment in dry autumns, and higher autumn yield.

Summer fallow involves spraying the paddock in spring, while the pasture is still green and growing so you get a good spray kill. Then the pasture is left, retaining its soil moisture through to sowing in early autumn. If there is a further weed strike, spray again. Weeds like grass plants are basically 'pumps' that extract water from the soil so you lose moisture, but the second spray also gives another chance to kill weeds for a weed-free pasture.

Direct drilling can be very successful with cocksfoot and brome, and fits well with a summer fallow because it prevents moisture being lost through cultivation. If you are cultivating, prepare a fine, well compacted, weed-free seed bed to allow correct seed depth and soil moisture retention for fast germination.

Sow early

Bareno and *Safin* are best sown when soil temperatures are above 12°C, during late summer or early autumn. This gives plants time to adequately establish before winter. Establishment is much slower in cool conditions.

Sowing

Sow seed at 10-20 mm. Take care when drilling *Bareno*, seed may not flow well through some drills. *Bareno* has a higher sowing rate because its seeds are much larger than cocksfoot.

Legume friendly

A benefit of *Bareno* and *Safin*'s slower establishment is that clovers tend to establish well in these pastures. Typically both white and sub clover are sown with them.



Bareno (left) versus perennial ryegrass in late November, Lees Valley.

WHITE CLOVERS

White clover, and sometimes sub clover, are normally added to all ryegrass, brome or cocksfoot pasture mixes. They are critical to dryland farm systems, as well as fixing atmospheric N, clover provides palatable, high ME feed for rapid LWG.

In brief: Sow at 3 kg/ha bare seed (or 4 kg/ha treated) mixing a higher yielding medium leaved cultivar (e.g. *Weka*) with a smaller leaved persistent type (e.g. *Apex*).



Apex spreads strongly across bare ground, increasing legume content.

White clover is a key component in New Zealand pastoral systems due to its high feed value and warm season growth.

Correct soil fertility is essential. Clover is sensitive to soil pH, growing best over 5.6. Ensure adequate phosphate, sulphur and molybdenum levels.

Compared to grass, white clover is more difficult to establish. To achieve high clover content, take care when sowing these cultivars. Clover seed is small, with minimal energy reserves. It needs to be sown shallow (2-3 mm), with plenty of light and space available after seedlings emerge. If drilling, putting ryegrass and clover in the same row suppresses clover, so where possible use a roller drill or broadcast cover. Alternatively if your drill (or your contractor's) has a separate small seed box, order clover seed separately and sow it through this.

<i>Weka</i> white clover	<i>Apex</i> white clover
<ul style="list-style-type: none"> • <i>Weka</i> is a medium leaved cultivar providing high DM yields. • It has good tolerance of clover root weevil and dry conditions. • Mix with <i>Apex</i> in dryland sheep & beef systems. 	<ul style="list-style-type: none"> • <i>Apex</i> is a persistent smaller leaved clover. • It has a high stolon density, very good drought tolerance, resistance to leaf rust, pepper spot and clover rot • It has good clover root weevil tolerance.

SUBTERRANEAN (OR SUB) CLOVER

In brief: Sub clover is a cool season active annual legume, which handles much drier conditions than white clover by surviving as seed. Success lies in managing it to ensure it reseeds.



Sub clover is the most widely sown annual legume in summer dry New Zealand. On hill country it is common to see it growing well in drier areas, soils and/or slopes, with white clover surviving well in wetter parts.

Sub clover yields more in early spring than white clovers, typically beginning growth a month earlier.

As an annual plant, sub clover must survive from year to year by setting seed in late spring. Correct management of sub clover is vital for persistence. In the first year, paddocks must be only lightly grazed in late spring (and ideally locked up), to allow good reseedling so that the cost of establishment is not squandered. Subsequently, reseedling should be allowed to reoccur about every 5 years. In practice, multiple paddocks can be allowed to reseed in years of good spring growth, whereas in years when feed is allowing paddocks to reseed this might not be possible.

In autumn, best regeneration comes in pastures that are hard grazed (e.g. 700-1000 kg DM/ha). This helps ensure bare ground for sub clover seedling regeneration. After a good strike, spell the paddock until the sub clover plants have developed at least four trifoliate leaves.

Sow sub clover at 8-10kg/ha because of its large seed size. Seed may require inoculation with rhizobium bacteria if annual clovers are scarce in the area. Sub clover requires a different rhizobium to white clover.

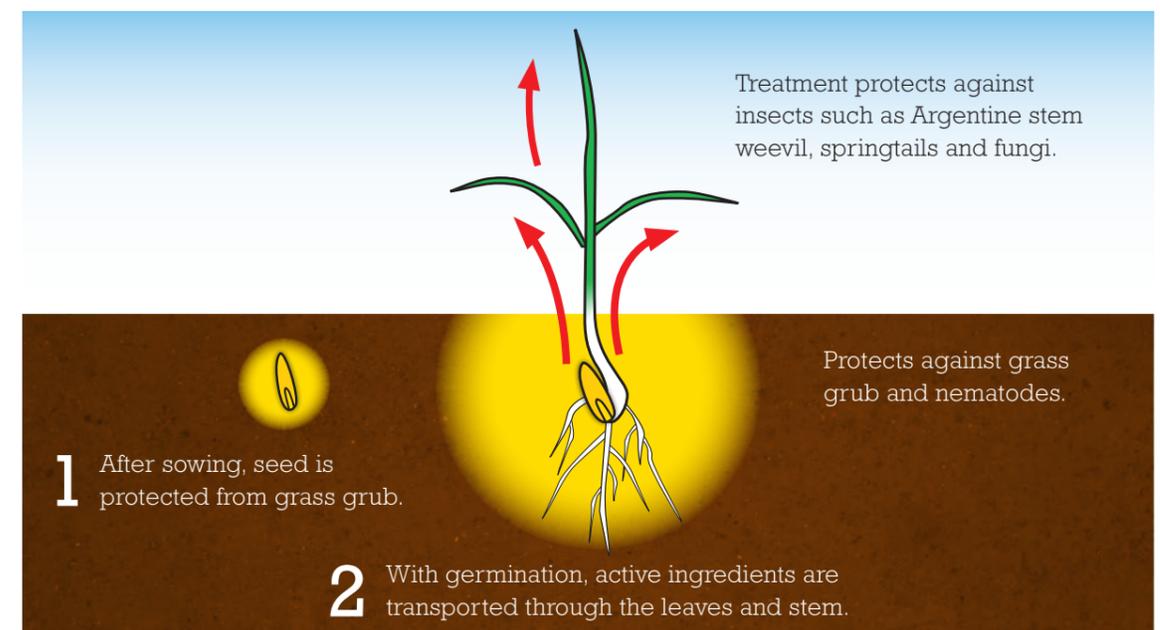
Sub clover seed is often in short supply, so order early.

AGRICOTE SEED TREATMENT

In brief: Sowing treated seed (e.g. *AGRICOTE*) is a key step in achieving strong, even pasture establishment.

Seed treatment is the process of coating individual grass, clover, or other seeds with a mix of fungicides and insecticides (and sometimes nutrients) to protect and enhance establishment.

Agriseeds *AGRICOTE* seed coatings contain enough insecticide and fungicide to last for approximately six weeks post-sowing, the time that young plants are most vulnerable to insect attack and disease. The active ingredients are systemic, so as well as protecting the seed itself, they 'grow' through the plant tissue of the seedling as it emerges from the ground.



New *AGRICOTE* clover formulation

Agriseeds has released a new clover seed treatment adding a formulation of nutrients (N, P, Mn, Zn, Mo and lime) necessary for seedling and root vigour. These can be unevenly distributed in a soil, so the new seed treatment ensures they are available to the young plant.

These nutrients add to the nematicide and fungicide used in the previous *AGRICOTE Clover* seed treatment.



Member of the Royal Barenbrug Group

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Superior pastures from Agriseeds
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