AGRICOM.CO.NZ

HERB & LEGUME GUIDE.

AGRICOM
Pastures for Profit®


AGRONOMIC
LEADERSHIP
FROM OUR R&D
TO YOUR FARM.

INTRODUCTION TO AGRICOM

In recent years the evaluation, understanding and uptake of forage herb varieties has grown greatly. Whether it's offering solutions through early season feed requirements or enabling quality drymatter production through the challenging summer months, our forage herb products **Choice** chicory, **Ecotain®** environmental plantain and **AgriTonic** plantain have played a major role in providing alternative forage systems for farmers over recent years. Our knowledge of the use and application of these products has evolved significantly. Once used solely as components within pasture mixes, today these varieties are likely to be the primary or sole forage species within a grazing system. These species have made a large contribution in providing shoulder season feed across much of the country in many farm systems.

We are proud of the research and evaluation work carried out on properties such as Agricom's cattle research facility 'Marshdale' in North Canterbury. Such research underpins much of what we know today about **Ecotain®** environmental plantain and **AgriTonic** forage systems and in recent times the exciting development of **Relish** red clover as a sole forage species.

In planning your spring forage cropping programme this year, take time to consider the concepts outlined within this guide. Well managed herb and legume crops and mixes will continue to provide the cheapest form of exceptional quality drymatter production. We hope this guide goes a long way in aiding your planning along with success and profitability from the resultant crop.

CONTENTS

Ecotain®
ENVIRONMENTAL PLANTAIN

Ceres
AgriTonic
Plantain

IDEAL FOR LACTATION FEED.

Sheep and Cattle

Ecotain® environmental plantain and **AgriTonic** plantain are broad-leaved, coarse rooted herbs that are adapted to a range of soil types, rainfall zones and other climatic conditions. **Ecotain** and **AgriTonic** are unique as they are upright in all seasons and have similar autumn and winter activity to perennial ryegrass.

STANDOUT POINTS FROM CURRENT RESEARCH AND EXPERIENCE IN SHEEP AND CATTLE

- More prime lambs at weaning and heavy ewe weaning weights
- High dressing out percentage in lambs and cattle
- Ideal grass alternative (substitute) for creating and maintaining high legume content pastures
- Drymatter (DM) production through autumn, winter and early spring similar to perennial ryegrass pastures
- Fast recovery from hot dry summer conditions
- Reduces dag production in sheep
- Helps to elevate the copper (Cu) and selenium (Se) supply to the grazing animal
- In numerous studies **Ecotain** has demonstrated the ability to reduce environmental impacts (see pages 8-9)

Ecotain was awarded the 2019 Primary Industry Innovation and Collaboration Project Award.

Ecotain is currently a blend of **Tonic** and **AgriTonic**.

KEY TIPS

- Plant with clover to maximise liveweight gain potential, nitrogen fixation and ground cover to help prevent weed invasion
- First graze when **Ecotain®** or **AgriTonic** has 6 true leaves
- Continue to graze from 20-25 cm down to 4 cm. Avoid older leaf accumulating
- Graze with higher value stock to maximise returns i.e. ewe hoggets, multiple bearing ewes, cull or final lambing ewes
- Monitor insects (e.g. carpet moth, grass grub) in early summer when conditions are very dry and apply preventative insecticide when required
- Apply strategic nitrogen to boost growth in autumn, late winter and early summer
- Typically, high dressing out percentage allows stock to be drafted at lower liveweights

PRE AND POST GRAZING OF ECOTAIN AND AGRITONIC

- Monitor for target residual to maximise liveweight gain per hectare
- Optimise stocking rates for the best animal and per hectare performance
- Aim to eat 70-75% of forage on offer (2 kg DM/lamb/day for a 33-35 kg lamb)

Pre grazing of **Ecotain** and **AgriTonic**.

Post grazing of **Ecotain** and **AgriTonic**.

Ecotain®
ENVIRONMENTAL PLANTAIN

Ceres
AgriTonic
Plantain

IMPROVES PASTURE DIVERSITY.

Dairy

Ecotain® environmental plantain and **AgriTonic** plantain can be used as a crop or alternate pasture on unirrigated summer dry dairy farms. **Ecotain** and **AgriTonic** are longer term options than chicory with the potential life span of two to three summers. **Ecotain** and **AgriTonic** provide a longer term cropping option that helps to balance the demand on land area in spring that is required to be removed for annual summer cropping. **Ecotain** and **AgriTonic** are also ideal additions to pasture mixes for improving pasture diversity and providing quality drymatter through summer and autumn. Often weed control options limit this application, however **Ecotain** and **AgriTonic** can play a significant role in an undersowing programme and are also ideal options for broadcasting onto damaged pasture.

Ecotain was awarded the 2019 Primary Industry Innovation and Collaboration Project Award.

Ecotain is currently a blend of **Tonic** and **AgriTonic**.

To get longevity and ease of management, broadcast a heavy rate of clover into **Ecotain** or **AgriTonic** stands in the first autumn after weed control has been achieved.

STANDOUT POINTS FROM CURRENT RESEARCH AND EXPERIENCE IN DAIRY SYSTEMS*

- **Ecotain** plantain can produce over 19 tonnes of drymatter per hectare per year in the Waikato
- First year **Ecotain** retains high leaf quality through summer relative to unirrigated ryegrass
- When **Ecotain** is well managed, second and third year stands maintain quality through summer relative to unirrigated ryegrass
- When the metabolisable energy (MJ ME) of irrigated ryegrass was poor (9.6 MJ ME) supplementing ryegrass with **Ecotain®** plantain increased cow drymatter intake by 6% and milksolids (MS) yield by 19%
- **Ecotain** can be successfully used as a deferred late spring feed in dry areas and will return to a quality productive state within one grazing round
- **Ecotain** is an easy option to include in an undersowing or broadcasting programme
- In numerous studies **Ecotain** has demonstrated the ability to reduce environmental impacts (see pages 8-9)

KEY TIPS

- Use **Ecotain** or **AgriTonic** where longer term and/or cool season production is important. Use **Choice** where summer production is paramount
- Monitor the crop like a brassica and spray for weeds and insects early (e.g. carpet moth between January and February in dry years)
- Manage **Ecotain** and **AgriTonic** like a summer crop. Feed a single break every day through the summer as with chicory, though the crop is more flexible and should not be "pigeon-holed" into a set system
- Where clover is not present use nitrogen. Avoid accumulation of older leaves as they can cause palatability issues especially in lower N soils

*Adapted from Minneé and Lee. (2012). Proceedings of the workshop "Plantain for Northland Pastures."

Pre grazing of **Ecotain** and **AgriTonic.**

Post grazing of **Ecotain** and **AgriTonic.**

Ecotain®
ENVIRONMENTAL PLANTAIN

REDUCED NITROGEN LEACHING.

THE SCIENCE

Along with the agronomic benefits described on pages 4-7, **Ecotain®** environmental plantain also has significant environmental benefits. **Ecotain** combines four independent modes of action that work together to significantly reduce N leaching from the urine patch.

Research has demonstrated that not all plantains (current cultivars or breeding lines) are capable of reducing nitrate leaching from the urine patch through the four mechanisms **Ecotain** can.

1. DILUTE

Ecotain increases the volume of urine animals produce, which means the N being excreted is in a more dilute form, resulting in a reduced N load in the urine patch.

2. REDUCE

Ecotain reduces the amount of dietary N which is excreted in urine, compared with ryegrass. This reduces the amount of N released into the soil via the urine patch.

3. DELAY

In urine patches from animals grazing **Ecotain**, the conversion from ammonium to nitrate is delayed. Slower conversion allows plants a greater opportunity to uptake N, significantly reducing the potential for leaching.

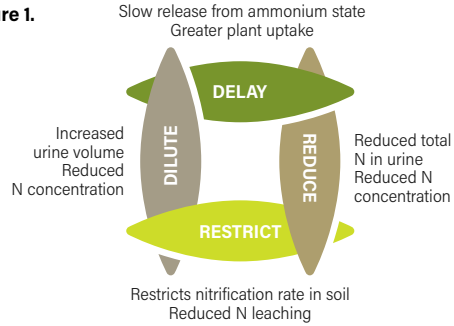
4. RESTRICT

The presence of **Ecotain** plants in the soil reduces nitrification, likely through the effect of a biological nitrification inhibitor.

Ecotain was awarded the 2019 Primary Industry Innovation and Collaboration Project Award.

Ecotain is currently a blend of **Tonic** and **AgriTonic**.

Figure 1.



THE POWER OF 4

Ecotain® environmental plantain has been shown to reduce nitrogen leaching from the urine patch. Lincoln University lysimeter studies showed a reduction in nitrogen leaching by 89% from the urine patch compared with ryegrass white clover. Figure 1 demonstrates the four mechanisms working together.

ENVIRONMENTAL FUNCTIONALITY

Research has demonstrated that not all plantains (current cultivars or breeding lines) are capable of reducing nitrate leaching from the urine patch through the four mechanisms **Ecotain** can – dilute, reduce, delay and restrict[1].

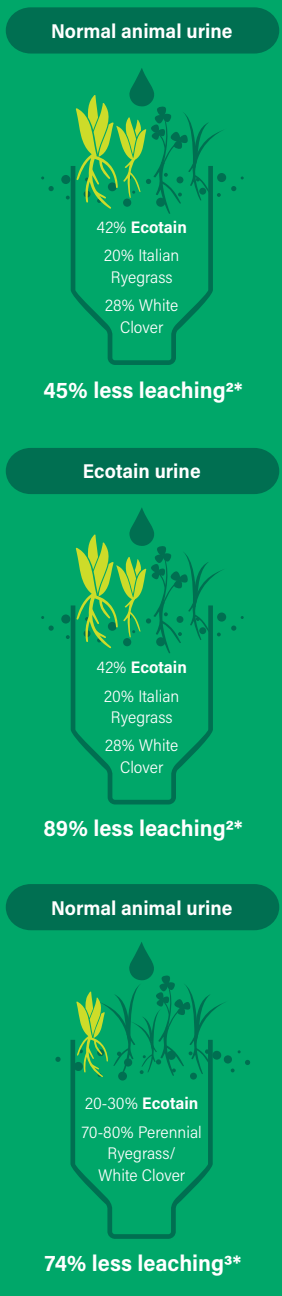
Figure 1 represents the outcomes of a lysimeter study with the first and third lysimeter demonstrating the Restrict function alone while the second lysimeter represents all four functions working together.

AGRONOMICS

In all agronomic aspects as well as environmental, **Ecotain** is an excellent example of a high quality, productive cool season active forage plantain.

[1] Judson *et al*., (2018).
[2] Woods, (2017) used with permission.
[3] Carlton *et al*., (2018).
* From the urine patch. Compared to control ryegrass/white clover pasture.

Figure 1. Nitrate leaching reductions using different urine and pasture mix treatments from lysimeter research.



Grasslands®
Choice
Chicory

NZ BRED, CERTIFIED CHICORY.

Sheep and Cattle

Choice was bred in New Zealand by AgResearch, Grasslands, the breeders of the original long lived forage chicory, Grasslands Puna. **Choice** was bred from long lived chicory parents under grazing and selected for improved cool season growth, disease tolerance and recovery from grazing. **Choice** in sheep and cattle systems is often sown by itself as a crop or with white clover and sometimes red clover. **Choice** crops normally persist for two to three summers depending on the free draining nature of the soil.

Choice can also be added to a pasture mix to improve summer production and quality enabling new pastures to be used for finishing.

STANDOUT POINTS FROM CURRENT CHOICE RESEARCH AND EXPERIENCE IN SHEEP AND CATTLE

- **Choice** is a uniform, high quality summer forage with ME's ranging between 11.5-13.0 MJ ME/kg DM
- Average lamb liveweight gains of around 250 grams/head/day are achievable with ranges from 220 to 400 grams/head/day
- High dressing out percentages in lambs and cattle

- Faecal egg counts are reduced in lambs grazing chicory compared with perennial ryegrass
- Chicory carries lower spore counts for facial eczema, and potentially supports lower concentrations of zearalenone
- Carrying capacities have ranged from 40-70 lambs/ha with an average of 40 on dryland and 55 with irrigation or summer rainfall
- Chicory is a good source of minerals particularly (Zn, Cu, Mg, P, Ca, K)

Pre grazing of **Choice.**

KEY TIPS

- Establish on a static or rising 12˚C soil temperature
- Use nitrogen (DAP) at sowing and then again after first grazing regardless of the inclusion of clover
- After planting **Choice** always roll the paddock and aim to spray for weeds, irrespective of crop growth stage, when weeds are at the 2-4 true leaf stage
- First graze should be at 7 true leaves which will be close to 2,200 kg DM/ha
- Sheep and cattle grazing **Choice** are unlikely to experience photosensitivity
- **Choice** can be grazed to deliver up to 100% of the diet
- **Choice** has a reliably high daily growth rate in summer offering twice that of pasture
- Graze from 20-25 cm to 4 cm and maintain a 14-16 day rotation in spring and early summer. Attempt to prevent all reproductive growth as this will limit production

PRE AND POST GRAZING

- Monitor for target residual to maximise liveweight gain per hectare
- Optimise stocking rates for the best animal and per hectare performance
- Aim to eat 70-75% of forage on offer (2 kg DM/lamb/day for a 33-35 kg lamb)

Post grazing of **Choice.**

Grasslands®
Choice
Chicory

EXCELLENT REGROWTH POTENTIAL.

Dairy

Choice chicory in dairy systems is a reliable crop for summer dry conditions once fully established. Chicory's deep tap root, high drymatter growth rates and excellent regrowth potential in hot conditions makes it a versatile summer crop. **Choice** has the ability to continue to supply quality feed beyond the point when most summer turnips are finished; an important feature in a year with extended dry conditions.

Choice can also be added to a pasture mix to improve summer production and quality enabling new pastures to carry higher quality feed later during dry summers.

STANDOUT POINTS FROM CURRENT CHOICE RESEARCH AND EXPERIENCE IN DAIRY SYSTEMS

- Spring sown summer crops of **Choice,** with or without clover, average around 11 t DM/ha ranging from 8 to 15 t DM/ha in 6-7 months
- As a summer crop, **Choice** is a very high quality feed source with ME's of 11.5 to 13.0 MJ ME/kg DM and crude proteins of 22% to 27% at a time when unirrigated ryegrass can contain both low ME and low crude protein

- When pasture quality is poor (below 10 ME) feeding **Choice** at 20-40% of the diet can increase milksolids production by 17%*
- Chicory is a responsive species to high fertility and is well suited to effluent paddocks where the deep tap root and high summer growth rates make it ideal for utilising surplus nutrients
- Chicory is an ideal break crop, reducing insect pest build up and providing an opportunity to control difficult weed grasses such as yellow bristle grass

KEY TIPS

- The amount you plan to feed your cows and your potential yield will determine how much **Choice** you should sow. This could be as much as 10% of your area
- Use nitrogen (DAP) at sowing and then again after first grazing
- After planting **Choice** always roll the paddock
- Once you have planted **Choice**, aim to spray for weeds irrespective of crop growth stage when weeds are at the 2-4 true leaf stage
- Graze when the chicory is 20-25 cm high (Red Band gumboot height) and down to a residual of 4 cm

IN AREAS WHERE CHICORY DOES NOT SURVIVE INTO A SECOND YEAR

In the autumn after spring sowing (late March, early April) and before the last graze, spray the crop with glyphosate (25 cm of cover) and then graze off three days later. Immediately direct drill in new perennial ryegrass with **AR37** endophyte with DAP down the spout. **Choice** is highly productive in the late autumn and if left unchecked will often smother young grass.

* Lee and Minneé. (2012). DairyNZ Technical Series, August 2012. Chicory and plantain – your questions answered.

Pre grazing of **Choice** dairy.

Post grazing of **Choice** dairy.

Grasslands®
NEW
Titan 5
Lucerne

Grasslands®
Torlesse
Lucerne

PROVEN PERENNIAL LEGUME.

WHAT IS IT?

Lucerne is an erect growing, deep tap rooted perennial legume that is extremely persistent in low rainfall, free draining dryland conditions. It is the most commonly used perennial legume crop in New Zealand. It can be successfully used in a wide range of environmental conditions, however expectations of longevity of rotation length needs to be moderated in higher rainfall environments and heavier soil types.

Titan 5 is an exciting new dormancy 5 lucerne variety that is a cross between a *Medicago sativa* lucerne (purple flower) and *Medicago falcata* (yellow flower) lucerne.

The introduction of unique *M. falcata* material provides the potential to add new diverse genetics to further capture traits for persistence, drought tolerance and water use efficiency over traditional *M. sativa* varieties of similar dormancy. It is bred in Australia and is suitable to a range of climatic conditions.

Torlesse is a great example of a fine-stemmed, resilient, dormancy 5 (*medicago sativa*) lucerne. It is mostly recommended in rotational grazing and supplementary feed systems where it is widely used in the sheep industry. It is suitable for cattle of all types including dairy cows although bloat is a risk from any lucerne in direct grazing systems. It is very suitable for deer.

KEY SEASONAL POINTS

Winter

- Hard graze with large mobs in early to mid-winter and apply weed control 10-14 days later
- Timing of winter cleaning (grazing and weed control) impacts on the speed and amount of early spring growth

Spring

- Start grazing the first paddock of the spring rotation at around 20 cm which often is over fewer grazing days (higher start heights often create a rotation that leads to a greater stem component and reduced quality and utilisation in the later grazed paddocks)
- Establish a 5-6 break or paddock rotation allowing a 35-45 day recovery
- As with making all silages there is a significant effect of timing with lucerne. Not all cultivars initiate flowering at the appropriate cutting time in spring. Check for the initiation of basal nodes indicating the plant is ready for its next regrowth phase. This will coincide with a high quality phase, while leaving too long will elevate stem component and drop silage quality

Summer

- Run a 30-35 day rotation for grazing
- Cut silage focusing on timing to manage quality

Autumn

- Allow a root reserve recharge period of around 50 days at some stage through February to April. This can be done in alternate years if all paddocks cannot be rested. This management has a big effect on persistence and subsequent spring production potential

For more extensive information check the Beef and Lamb website on lucerne best practises that includes Lincoln University research on lucerne management.

Titan 5 lucerne.

Assessing lucerne seasonal yield.

Grasslands®
Relish
Red Clover

STEP CHANGE IN CLOVER GENETICS.

Red Clover

WHAT IS IT?

Relish red clover has been extremely successful across New Zealand. Highly productive, **Relish** shows outstanding persistence characteristics. **Relish** is ideally suited to pasture mixes where its growth habit and breeding should help to maintain red clover content over time.

Relish is highly productive in the spring, and its semi-erect habit makes it suitable for set stocked lambing (as early as September). It will often require one grazing in late autumn and in many mild climates will require grazing through winter.

Being a legume, **Relish** requires no nitrogen fertiliser to grow large amounts of forage during the warmer seasons, which is a real benefit for sheep production systems.

STANDOUT POINTS FROM CURRENT RED CLOVER RESEARCH AND EXPERIENCE IN SHEEP SYSTEMS

- Very high average lamb weaning weights with a high percentage sold prime at weaning
- Ewe liveweights at weaning higher than from ewes on ryegrass pasture
- High summer liveweight gain potential
- High dressing out percentages in lambs
- Significant build up of soil nitrogen that can be used to enhance future cropping or pastoral options

KEY TIPS

- Rotational graze to maximise growth potential
- Graze from 20-25 cm to 4 cm during the growing season
- Spring growth is very rapid – prepare to utilise/increase stocking rate accordingly
- Also utilise with high margin/priority stock
- Never allow red clover to build up too much stem as this will reduce quality for the grazing animal and if too advanced will reduce silage quality
- Hard graze in autumn to clean up residual stems and reduce clover cover that may increase disease presence in winter
- Monitor paddocks with soil testing and apply P, K and S as required to maximise red clover growth potential

Pre grazing of **Relish** red clover.

Post grazing of **Relish** red clover.

Annual Clovers

WHAT ARE ANNUAL CLOVERS?

Annual clovers are a group of legumes that are sown or germinate in the autumn. They grow vigorously through late winter and spring – then die, often only living for 6-8 months. There are three broad types of annual clovers used in New Zealand.

PERENNIAL ANNUAL CLOVERS

Perennial annual clovers achieve their perenniality through seed production, producing high levels of hard seed which survive many years and germinate after hard summer conditions following autumn rainfall.

This group is split into two types of perennial clovers:

- **Subterranean clovers –** such as **Coolamon,** which set seed close to the ground. Once the seeds (in burrs) are matured, the plant actively pushes the burrs into the ground
- **Aerial seeded clovers –** these are annual clovers that when going into a reproductive state, typically develop stems similar to red clover. They can be up to a metre high and are ideal for silage systems as well as direct grazing. An example of this is **Viper** balansa clover

TRUE ANNUAL CLOVERS

These annual clovers are soft seeded which lead to limited survival over time. This is often due to early germination followed by hot dry conditions killing the seedlings (false break). These types of clovers are ideal for crop rotation and hay and silage production; with **Resal** Persian clover being an example.

Coolamon
Subterranean Clover

LONG TERM PERSISTENCE.

WHAT IS IT?

Coolamon is a mid season flowering, moderately hard seeded subterranean clover making it suitable to all true east coast dryland environments that may start drying out by the start of November. Sub clovers spread using runners and need to set seed before the onset of dry conditions for persistence to be achieved. Hard seededness in sub clover is a major driver of persistence, **Coolamon** is moderately hard seeded for its maturity and considerably more hard seeded than Woogenellup, a naturalised mid heading common variety in New Zealand.

STANDOUT POINTS

- **Coolamon** is a mid heading cultivar similar to Woogenellup and 1-2 weeks earlier than Goulburn, setting viable seed mid to late October
- **Coolamon** is a medium leaved dense cultivar ideal for setting large amounts of seed under set stocking during lambing
- Good winter activity with excellent early spring growth with the ability to grow well into mid November with rainfall
- Ideal autumn sown addition to established dryland **Ecotain®** or **AgriTonic** pastures to improve spring legume content
- **Coolomon** has outstanding tolerance to false breaks common in New Zealand which makes it a very persistent sub clover.

Viper
Balansa Clover

FAST SPRING PRODUCTION.

WHAT IS IT?

Viper is a late flowering long season balansa clover, which is known as a self-regenerating annual legume. It is a semi-erect, hollow-stemmed species that can grow to 1 metre tall, but remains prostrate when grazed. **Viper's** leaves are white clover like, but vary greatly in size, shape and leaf marking. Leaflet margins can be smooth or serrated. The variation in leaf marking and shape is due to individual varieties being composed of a mixture of several genotypes. Its leaves and stems are hairless. Flowers are white-pink in colour and similar shape to white clover. Seeds vary in colour from pale yellow to dark brown. They are a little smaller than white clover. They are very hard seeded and will often not start germinating substantially until they have been through two summers. Although predominantly autumn sown, **Viper** can be strategically spring sown with spring cereals, Italian ryegrass or brassicas. This provides a fast 3-4 month burst of legume growth.

STANDOUT POINTS

- Suited to more than 600 mm annual rainfall in light soil and 550 mm in heavier soils
- Ideal autumn sown addition to established dryland **Ecotain®** or **AgriTonic** pastures to improve spring legume content
- Useful addition to a spring sown red clover stand to provide a bulk of high quality legume at the first grazing
- Best sown in the autumn with annual or Italian ryegrass to provide high clover content through spring
- Can be spring sown with summer brassicas and cereal silage when herbicides are unlikely to be needed

Resal
Persian Clover

HIGH LEVELS OF WINTER ACTIVITY.

WHAT IS IT?

Resal is a soft seeded Persian clover with an erect growth habit. It demonstrates late season maturity while maintaining high levels of winter activity. This late maturity makes **Resal** highly productive throughout all of spring. Persian clover has an indeterminate flowering habit, it can take full advantage of extended seasons should they occur. **Resal** produces a large number of thin walled, hollow stems, which contribute to the variety being erect and bushy in appearance. **Resal** is well adapted to various soil types and is tolerant of waterlogging and mild soil salinity. Although predominantly autumn sown, it can be strategically spring sown with spring cereal, Italian ryegrass or brassicas. This provides a fast 3-4 month burst of legume growth.

STANDOUT POINTS

- Suited to more than 600 mm annual rainfall and clay soils
- Most suited to earlier autumn sowing allowing for more winter growth
- Ideal autumn sown addition to established dryland **Ecotain®** or **AgriTonic** pastures to improve spring legume content
- Useful addition to a spring sown red clover stand to provide a bulk of high quality feed at the first grazing
- Best sown in the autumn with annual or Italian ryegrass to provide high clover content through spring
- Can be spring sown with summer brassicas and cereal silage when herbicides are unlikely to be needed

White Clovers

Mainstay is best suited to **Choice** chicory crops in fertile conditions where it can help maintain ground cover and add valuable production for further improving animal performance both in terms of milk production and liveweight gain. It also provides an established legume base for autumn sown grass to be drilled into once the chicory crop is finished.

- An exciting new generation robust large-leaved white clover
- **Mainstay** has shown outstanding recovery from drought in the Waikato
- Primary clover option for dairy and beef systems
- Ideal for high fertility finishing pastures

Useful for herb and red clover crops, **Tribute** will add to the total drymatter of crop productivity and help maintain ground cover. In **Ecotain®** or **AgriTonic** pastures **Tribute** will help maintain summer and autumn liveweight gain and palatability.

- Medium to large-leaved white clover
- High stolon density/leaf size ratio
- Improved out-of-season production
- Shown to be tolerant to clover root weevil

Nomad is suited to legume and herb pastures that are grazed to low residuals, particularly in summer dry conditions. **Nomad's** ground cover is very high and will help prevent weed invasion of bare ground which is often found in herb pastures.

- Small to medium-leaved white clover
- Bred for increased stolon recovery after dry summers
- Persistent white clover under hard grazing
- Should be included in all dryland mixes

Establishment Points to Consider

EX OLD PASTURE

Direct drill

Suitable soil structure

Double spray/fallow technique to control existing vegetation/ insects

Use slug bait

Full cultivation

Chemical control of *rhizomatous*/hard to kill weeds

Create a fine, firm seed bed appropriate for small seed

EX CROP

Direct drill

Suitable soil structure

Chemical control of weeds/insects

Use slug bait

HILL COUNTRY ESTABLISHMENT

Consider ability to control grazing, stock water and likely weed pressure

Pasture should be relatively short (4-5 cm) and leafy before spraying

Correct herbicide(s) and insecticide (be aware of plant-back periods)

Increased sowing rate of herb/clovers mixes where broadcasting

Use Superstrike® treated seed, apply slug bait with establishment fertiliser

Rainfall immediately post sowing critical for consistent reliable results

Planting

Correct sowing rate and compatibility of mixtures – impact on weed control options

Use Superstrike® treated seed

Ensure seed is covered with 5-10 mm of consolidated soil

Plant with establishment fertiliser e.g. 150 kg/ha DAP

Weed Control

Early control of weeds is critical

Contact your rural retail supplies company for exact chemical recommendations

Clearly state the mix of species used and primary weeds present

First graze at 6-7 true leaf stage for herbs, 4-6 leaf stage for red clover

Forage for Farm Systems

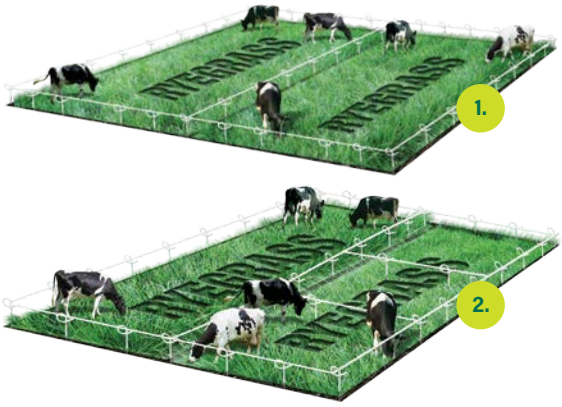
Testing new products is a key part of Agricom's Product Development Programme. Drymatter production plot trials remain the cornerstone of this programme with a series of trials located around New Zealand. These trials provide important information not only of total drymatter yield, but also seasonality of yield, persistence and other important traits critical for understanding their roles in farming systems. In addition to this agronomic testing, Agricom also uses animals to more fully explore how products might add value in a grazing systems context. Previously, there was considerable effort in comparing different cultivars in terms of their ability to support animal production. However, Agricom systems experiments determine the key systems parameters required to get the maximum production from a single cultivar. Two examples of this are presented on the opposite page.

1. Traditional View - Cultivar A vs cultivar B

- Small differences (less than 5%)
- Reasons typically unclear
- Sometimes differences can be hard to replicate on farm

2. Agricom View - Product and best management (to get the most out of a product)

- Big differences (up to 50%)
- Clear reasons for differences
- Able to be applied immediately on farm



Example Farm Systems

EWE LACTATION

Ryegrass

- Carries high stocking rate
- Good potential lamb growth but moderate number of prime lambs at weaning
- Ewes lose body weight
- Typically high faecal egg output for a short period

Ecotain®/AgriTonic

- High feed intake leads to potentially reduced carrying capacity
- Increased lamb growth rate (+75% per day) high proportion prime lambs at weaning
- Ewes increase body weight over lactation
- Faecal egg counts lower
- Increased ewe milk production

POST WEANING GROWTH

Red Clover

- Supports high animal performance
- Supports high stocking rates
- Lasts 2+ years
- Fixes its own nitrogen
- Conservation is easy
- Free (300 kg N/ha) nitrogen is available at the end of the 2-3 year cycle for the next crop/pasture

Summer Brassicas

- Fast feed
- Important in pasture renewal programmes
- Support high animal performance
- Shorter timeframe (provide 4 months grazing)
- Require nitrogen
- Difficult to conserve as baleage

AGRICOM VIEW

Specialist forages to fit the farm system

Herb and Legume Cultivar Summary Chart

	Ecotain® and AgriTonic *(Plantago lanceolata)*	**Choice Chicory** *(Cichorium intybus)*	**Relish Red Clover** *(Trifolium pratense)*
Suitability/Use	Lambing to weaning feed. Lamb and cattle finishing with legumes. Dairy: Ideal for maintaining summer milk production. Mixed in dairy pasture. Mixed with regrowth brassica	Dairy: Ideal for maintaining summer milk production. Finishing for sheep, deer and all classes of cattle. Mixed in pastures	Lamb finishing. Lambing to weaning feed. Silage production. Mixed in pastures
Fixes nitrogen	No	No	Yes
Drought tolerance	Moderate: Fibrous, coarse root system. Good survival, quick response to moisture	Good: Deep tap root	Moderate-Good: Tap rooted plant
Length of crop – productive years	2-4 years. Natural reseeding may increase persistence	6 months in wet dairy soils. 2-3 years, depending on soil type and total rainfall	Generally 2-3 years with grass weed control
Yield from spring sowing to May (t DM/ha)	8-14 t	8-15 t	8-14 t
Full year potential (t DM/ha)	14-19 t	12-17 t	12-17 t
Seasonal growth	All year	September-May	September-May
Summer	Mid-High	Mid-High	Very High
Autumn	Very High	Very High	High
Winter	High	Mid-Low	Mid-Low
Spring	High	High	Very High
Herbage quality	Dependent on stem content	Dependent on stem content	Dependent on stem content
Metabolisable energy (ME)	11.0-12.0 MJ ME/kg DM	11.5-13.0 MJ ME/kg DM	11.5-13.0 MJ ME/kg DM
Crude protein (%)	16-28% DM	16-27% DM	20-28% DM
Insects & diseases	Plantain moth, Porina, Grass grub	Can be susceptible to the rot disease *Sclerotinia* in cool, moist environments	Tolerance to clover root weevil* Slugs
Animal health	Elevated elements copper (Cu) & selenium (Se). Reduced dag production in sheep. Can induce hypocalcaemia in pregnant ewes if changed onto ryegrass pastures	Good source of mineral (Zn, Cu, Mg, P, Ca, K). Faecal egg counts are reduced in lambs compared to ryegrass. Lower spore levels for facial eczema and zearalenone	Medium to low formononetin (oestrogen). Bloat in cattle
Grazing suitability	Set stock late winter/spring for lambing. Tolerates frequent rotations, grazing at 15-20 day rounds.	Best suited to rotational grazing	Set stock early spring. Then rotational grazing as soon as possible
Suggested sowing rate (kg/ha)	12 Pure stand (or plus white clover) 2-3: Brassica mix 1-3: Pasture mix	6-8: Pure stand 1-3: Pasture mix	12: Pure stand. 4-6: Grass or brassica mix. Red clover does not spread like white clover, or reseed easily under modern grazing systems

* Gerard, P.J., Crush, J.R., Hackell, D.L. (2005). Interaction between *Sitona lepidus* and red clover lines selected for formononetin content. Annals of Applied Biology 147: 173-181.

Coolamon Subclover *(Trifolium subterranean)*	**Resal Persian Clover** *(Trifolium resupinatum)*	**Mainstay; Tribute; Nomad White Clovers** *(Trifolium repens)*	**Viper Balansa Clover** *(Trifolium balansae)*
Suited to free draining dryland environments, particularly under sheep grazing	Annual regenerating clover. Autumn sown for high spring yield. Can be strategically spring sown (e.g. red clover stand, brassicas and whole crop cereal silage)	Cultivar choice depends on stock class. Suited to moderate-high fertility soils, but less productive and persistent in dry situations	Autumn sown for high spring yield (e.g. into established **Ecotain®** or **AgriTonic** stands). Can be strategically spring sown (e.g. red clover stand, brassicas and whole crop cereal silage)
Yes	Yes	Yes	Yes
Good: Plants die in summer and new plants generate from hard seed	Requires resowing every year	Moderate-Low	Good: Plants die in summer and new plants generate from hard seed
6-8 months then reseeds and plants die. Will regenerate from hard seed over time	6-8 months then dies	Perennial clovers that survive through high stolon densities and reseeding	6-8 months then reseeds and plants die. Will regenerate from hard seed over time
Results pending	Results pending	Results pending	Results pending
Results pending	8-18 t	4-12 t	7-14 t
April-November	April-November	September-May	April-November
NONE - Establishing	NONE - Establishing	High	NONE - Establishing
High if sown early	High if sown early	Mid	High if sown early
High (warmer climates) Med (colder climates)	High (warmer climates) Med (colder climates)	Mid-Low	High (warmer climates) Med (colder climates)
Very High (peak Oct/Nov)	Very High	High	Very High (peak Oct/Nov)
High winter and spring	Generally High	High spring and summer	Generally High Depending on stem content
High	High	11.5-13.0 MJ ME/kg DM	High
–	High	High	High
–	–	Clover root weevil, Clover flea	–
Low levels of formononetin. Risk of bloat in cattle	No oestrogens. Risk of bloat in cattle	Risk of bloat in cattle	Low levels of formononetin. Risk of bloat in cattle
Set-stock early, then plants need to be spelled or lightly stocked later in spring if seed set is required for future persistence	Grazing rotations similar to other herb and red clover stands unless being shut up for silage production	Suitable for set stocking or rotational grazing dependent on cultivar choice	Plants need to be spelled or lightly stocked later in spring if seed set is required for future persistence
Minimum: 6 Standard: 8-12	6-10: Pure stand 3-6: Pasture mix with annual ryegrass or cereals	**Tribute** & **Nomad**: 2-5 in mix. **Mainstay**: 3-5. Often 2 different leaf sizes are mixed together to provide greater tolerance of differing management	4-6: Mixed sward

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