

HERB^{AND} LEGUME GUIDE

agricom.co.nz

AGRICOM 
Pastures for Profit®

Contents

02	Contents
03	Agricom
04-05	Tonic & AgriTonic - Sheep and Cattle
06-07	Tonic & AgriTonic - Dairy
08-09	Choice – Sheep and Cattle
10-11	Choice – Dairy
12	Red Clovers – Relish and Sensation
13	Red Clovers – Sheep
14	Annual Clovers
15	Coolamon
16	Viper
17	Lightning
18	White Clovers – Mainstay, Tribute and Nomad
19	Herb and Herb/Clover Stands
20	Forage for Farm Systems
21	Farm Systems
22-23	Herb and Legume Cultivar Summary Chart



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, **Tonic** and **AgriTonic** plantains have played a major role in providing alternative forage systems for farmers over recent years. **Choice**, **Tonic** and **AgriTonic** are well known varieties, but 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. Both 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 trialling 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 the '**Tonic** and **AgriTonic** forage systems' and more recently the development of red clover as a sole forage species, along with understanding the species' impressive capabilities as a flexible forage.

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



What are they?

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



Standout Points from Current Tonic and AgriTonic 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



Key Tips



Tonic and AgriTonic with Clovers (Sheep and Cattle)

- Plant with clover to maximise liveweight gain potential, nitrogen fixation and ground cover to help prevent weed invasion
- First graze when **Tonic** 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 Tonic and AgriTonic Plantains



Pre grazing



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)

What are they?

Tonic and **AgriTonic** can be used as a crop or alternate pasture on unirrigated summer dry dairy farms. **Tonic** and **AgriTonic** are longer term options than chicory with the potential life span of two to three summers. **Tonic** 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. **Tonic** 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 **Tonic** and **AgriTonic** can play a significant role in an undersowing programme and are also ideal options for broadcasting onto damaged pasture.

Standout Points from Current Tonic Research and Experience in Dairy Systems¹

- **Tonic** plantain can produce over 19 tonnes of drymatter per hectare per year in the Waikato
- First year **Tonic** retains high leaf quality through summer relative to unirrigated ryegrass
- When **Tonic** 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 **Tonic** plantain increased cow drymatter intake by 6% and milksolids (MS) yield by 19%
- **Tonic** 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
- The urinary nitrogen (N) content was lower in cows supplemented with **Tonic** plantain. This finding could have important future implications for the environment
- **Tonic** is an easy option to include in an undersowing programme

¹Adapted from Minneé and Lee. (2012). Proceedings of the workshop "Plantain for Northland Pastures."

Key Tips



Tonic and AgriTonic – Dairy

- Use **Tonic** 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 **Tonic** and **AgriTonic** like a summer crop. Feed a single break to herds 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

TO GET LONGEVITY AND EASE OF MANAGEMENT

Broadcast a heavy rate of clover into **Tonic** or **AgriTonic** stands in the first autumn after weed control has been achieved.

Pre and Post Grazing of Tonic and AgriTonic Dairy



Pre grazing



Post grazing

What is it?

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 beef 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)



Key Tips



Choice in Finishing (Sheep and Cattle)

- 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 which will limit production

Pre and Post Grazing of Choice



Pre grazing



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)

What is it?

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%¹
- 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

¹ Lee and Minneé. (2012). DairyNZ Technical Series, August 2012. Chicory and plantain – your questions answered.



Key Tips



Choice – Dairy

- 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 (redband 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 AR37 ryegrass with DAP down the spout. **Choice** is highly productive in the late autumn and if left unchecked will often smother young grass.

Pre and Post Grazing of Choice Dairy



Pre grazing



Post grazing



Red Clovers

What are they?

Relish and **Sensation** red clovers have been extremely successful across New Zealand. Both are highly productive, with **Relish** showing 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-prostrate 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.

Compared to **Relish**, **Sensation** is best suited to supplementary feed systems with Italian ryegrasses and other complementary forages, although it can still perform to high levels as a forage crop.

Being legumes, both **Relish** and **Sensation** require 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

Red Clovers – Sheep

- 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 and Post Grazing of Relish and Sensation Red Clovers



Pre grazing



Post grazing

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 **Denmark** and **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 **Lightning** Persian clover being an example.



Coolamon

Subterranean Clover

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 are stoloniferous spreading clovers that 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
- Hard seed levels, greater than Woogenellup, leading to an increasing in-ground seed bank providing long term persistence
- 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 **Tonic** or **AgriTonic** pastures to improve spring legume content



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 remain 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 **Tonic** 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



What is it?

Lightning is a soft seeded Persian clover with an erect growth habit. It demonstrates mid season maturity and can provide high levels of early growth compared to other soft seeded Persian clovers. This earlier maturity makes **Lightning** well suited to areas of medium rainfall. As Persian clover has an indeterminate flowering habit, it can take full advantage of extended seasons should they occur. **Lightning** produces a large number of thin walled, hollowed stems, which contribute to the variety being erect and bushy in appearance. **Lightning** 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 **Tonic** 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



- 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

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.



- 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

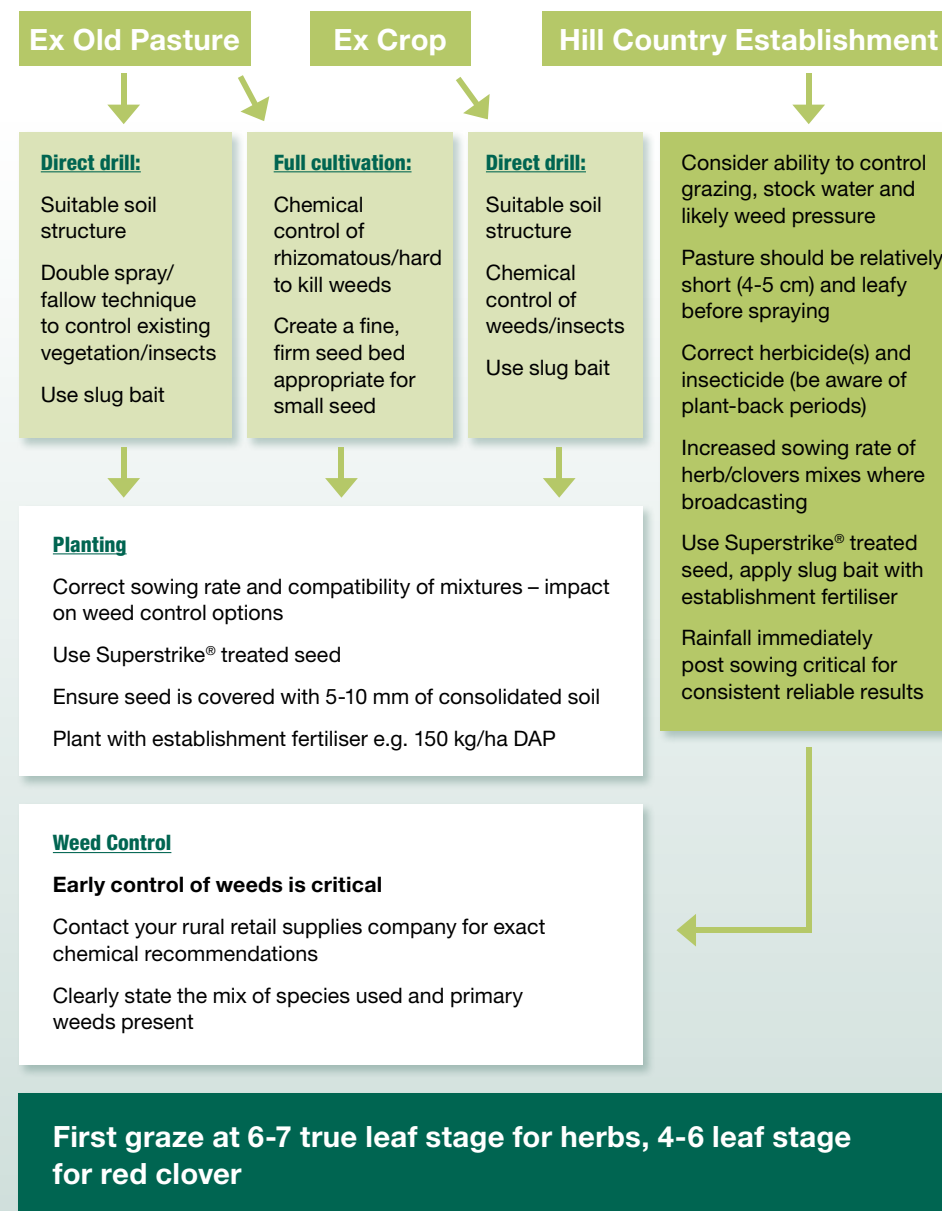
Useful for herb and red clover crops, **Tribute** will add to the total drymatter of crop productivity and help maintain ground cover. In **Tonic** or **AgriTonic** plantain pastures **Tribute** will help maintain summer and autumn liveweight gain and palatability.



- 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

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.

Herb and Herb/Clover Stands – Establishment Points to Consider



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.

Traditional View – cultivar A vs cultivar B



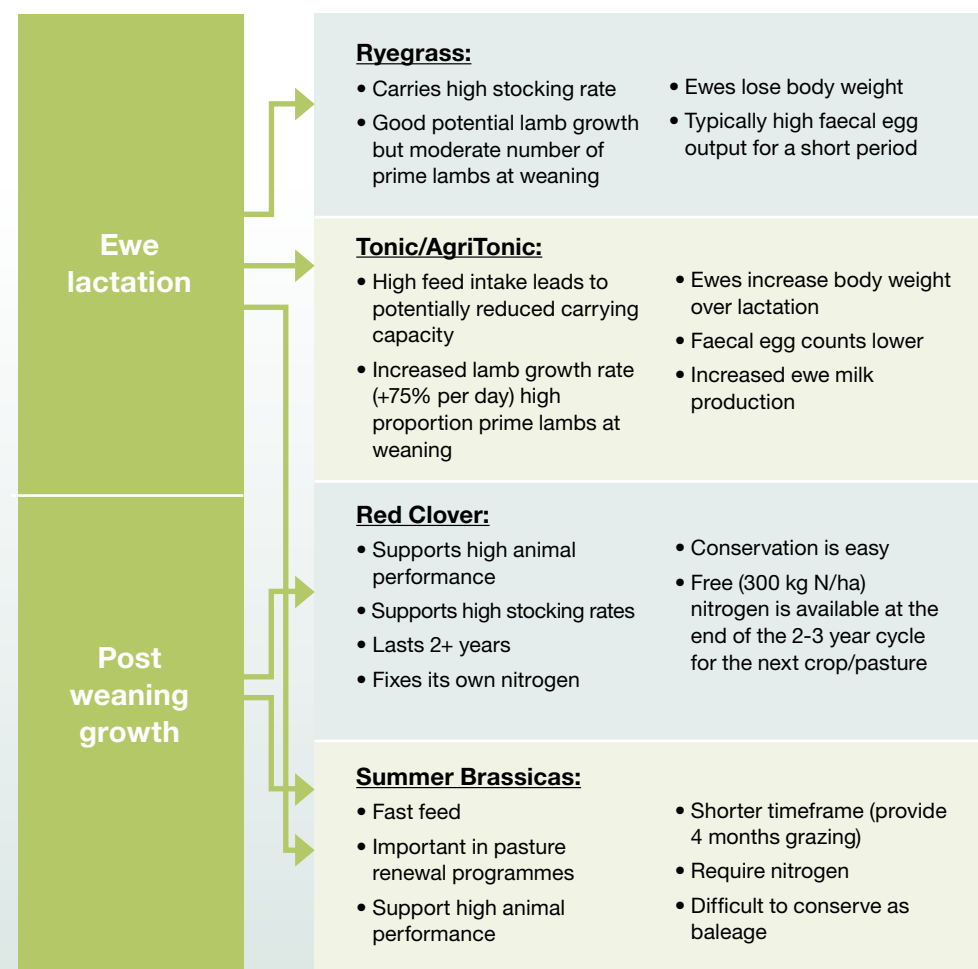
- Small differences (less than 5%)
- Reasons typically unclear
- Sometimes differences can be hard to replicate by farm

Agricom View – product and best management (to get the most out of a product)

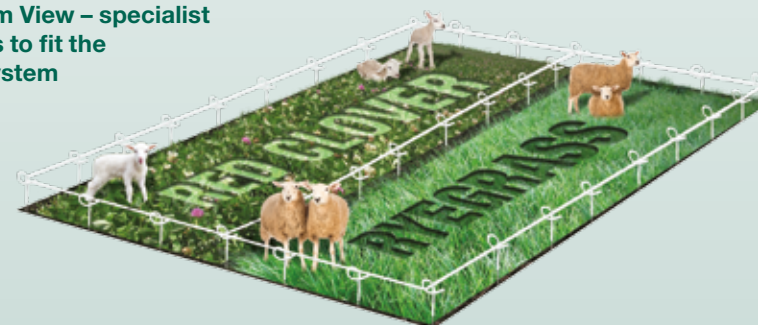


- Big differences (up to 50%)
- Clear reasons for differences
- Able to be applied immediately on farm

Farm Systems



Agricom View – specialist forages to fit the farm system



Herb and Legume Cultivar Summary Chart

	Tonic and AgriTonic Plantain (<i>Plantago lanceolata</i>)	Choice Chicory (<i>Cichorium intybus</i>)	Relish & Sensation Red Clovers (<i>Trifolium pratense</i>)		Viper Balansa Clover (<i>Trifolium balansae</i>)	Lightning Persian Clover (<i>Trifolium resupinatum</i>)	Mainstay; Tribute; Nomad White Clovers (<i>Trifolium repens</i>)	Subclovers (<i>Trifolium subterranean</i>)
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		Autumn sown for high spring yield (e.g. into established Tonic or AgriTonic stands) Can be strategically spring sown (e.g. red clover stand, brassicas and whole crop cereal silage)	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	Suited to free draining dryland environments, particularly under sheep grazing
Fixes nitrogen	No	No	Yes		Yes	Yes	Yes	Yes
Drought tolerance	Moderate: Fibrous, coarse root system. Good survival, quick response to moisture	Good: Deep tap root	Moderate-Good: Tap rooted plant		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
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		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
Yield from Spring sowing to May (t DM/ha)	8-14 t	8-15 t	8-14 t		Results pending	Results pending	Results pending	Results pending
Full year potential (t DM/ha)	14-19 t	12-17 t	12-17 t		7-14 t	8-18 t	4-12 t	Results pending
Seasonal growth	All year	September - May	September - May		April - November	April - November	September - May	April - November
<ul style="list-style-type: none"> • Summer • Autumn • Winter 	Mid - High Very High High	Mid-High Very High Mid - Low	Very High High Mid - Low		NONE - Establishing High if sown early High (warmer climates) Med (colder climates) Very High (peak Oct/ Nov)	NONE - Establishing High if sown early High (warmer climates) Med (colder climates) Very High	High Mid Mid-Low	NONE - Establishing High if sown early High (warmer climates) Med (colder climates) Very High (peak Oct/ Nov)
• Spring	High	High	Very High				High	
Herbage quality	Dependent on stem content	Dependent on stem content	Dependent on stem content		Generally High Depending on stem content	Generally High	High spring and summer	High winter and spring
• Metabolisable energy (ME)	11.0 - 12.0 MJ ME/kg DM	11.5 - 13.0 MJ ME/kg DM	9.0 - 10.4 MJ ME/kg DM		High	High	11.5-13.0 MJ ME/kg DM	High
• Crude protein (%)	16-28% DM	16-27% DM	20 - 28% DM		High	High	High	—
Insects & diseases	Plantain moth Porina Grass grub	Can be susceptible to the rot disease <i>Sclerotinia</i> in cool, moist environments	Tolerance to clover root weevil ¹ Slugs		—	—	Clover root weevil Clover flea	—
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		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
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		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	Set-stock early, then plants need to be spelled or lightly stocked later in spring if seed set is required for future persistence
Suggested sowing rate (kg/ha)	8-14: 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		4-6: Mixed sward	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	Minimum: 6 Standard: 8-12

¹ 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.

Laura Keenan
Upper North Island
Sales Manager
027 541 2232

Hamish Johnstone
Central North Island
Sales Manager
027 706 6309

Will Waddell
Western North Island
Sales Manager
027 807 8920

Rupert Thomson
Eastern North Island
Sales Manager
027 705 0664

Ben Trotter
Central Otago
Sales Manager
027 591 8712

Mark Kearney
Northern South Island
Sales Manager
027 229 5776

Lyndon Anderson
Central South Island
Sales Manager
027 595 3340

Gareth Kean
Southern South Island
Sales Manager
027 226 2777

Mark Brown
NZ Sales and Marketing
Manager
027 220 4110

Allister Moorhead
Product Development
Manager
027 433 7739

Sarah McKenzie
Extension Manager
027 704 6684

Sam Robinson
Fodder Beet Technical
Specialist
027 886 0499

Dylan Moratti
Upper North Island
Extension Agronomist
027 550 4085

Blake Gunn
Lower North Island
Extension Agronomist
027 406 0474

Fraser Harrison
Upper South Island
Extension Agronomist
027 404 5513

Stephanie Wright
Southern South Island
Extension Agronomist
027 404 5520

Disclaimer: Results will vary depending on all the circumstances. Agricom and its officers, employees, contractors, agents, advisers and licensors of intellectual property (Agricom) provide no assurances, guarantees or warranties in relation to any advice, information, cultivar, product or endophyte other than those that must be provided by law. To the extent permitted by law Agricom excludes all liability, and has no liability to anyone, however arising, from or in relation to any advice, information, cultivar, product or endophyte.

©Agricom, 2017.

Contact 0800 183 358,
visit agricom.co.nz
or visit your local seed merchant.

More great products from:
AGRICOM 
Pastures for Profit®