



Performance & Establishment Guide

Nitrogen management with the power of 4

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The single most important thing we as an industry can do to reduce N leaching is to focus on the urine patch, where up to 90% of the N leached to groundwater originates.



Ecotain® environmental plantain uses four independent mechanisms to reduce nitrogen leaching from the urine patch.

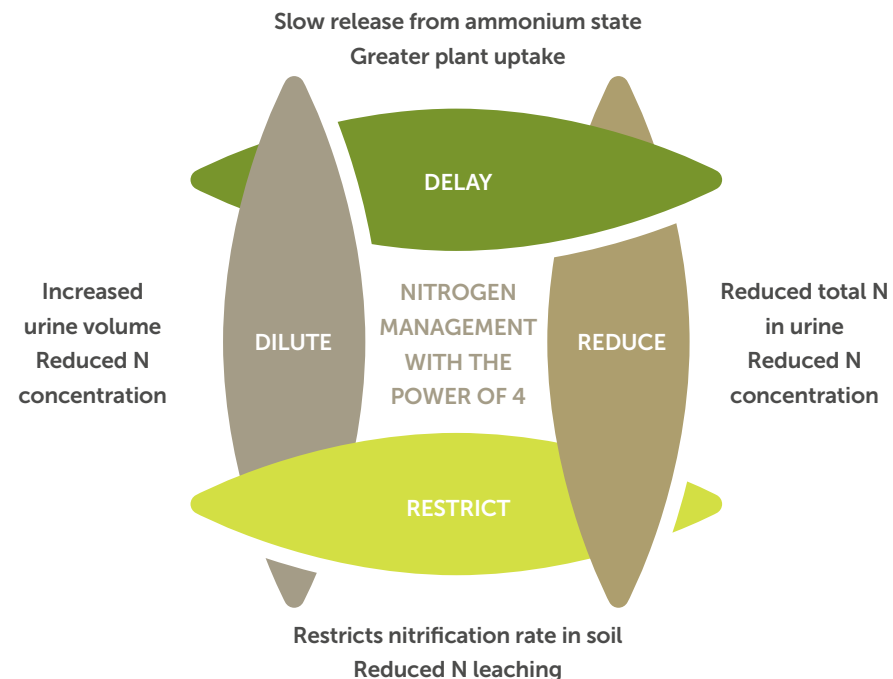
In addition to being a highly effective nitrogen leaching mitigation technology; Ecotain is an excellent forage, providing winter activity and drought tolerance, along with animal health performance benefits across virtually all high performing, pastoral based farm systems.

THE RESEARCH

Working alongside Lincoln and Massey universities, as well as Plant & Food Research, Agricom has developed the Greener Pastures Project to provide the scientific evidence on which Ecotain is based. Working across four different areas of science plus on-farm systems, this research and development programme has delivered a highly effective and practical solution to N leaching for New Zealand farmers. The Greener Pastures Project, together with information from the 'Forages for Reduced Nitrate Leaching (FRNL)' programme, provides a series of peer reviewed scientific papers to support the concepts and products. For more information on the project see ecotain.co.nz.

The Science

Ecotain® reduces nitrogen leaching from the urine patch using four independent mechanisms. With the potential to reduce N leaching from the urine patch by up to 89% when combined with other forage strategies, Ecotain is a game changer when it comes to managing N.



1 DILUTE

Ecotain® environmental plantain 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.

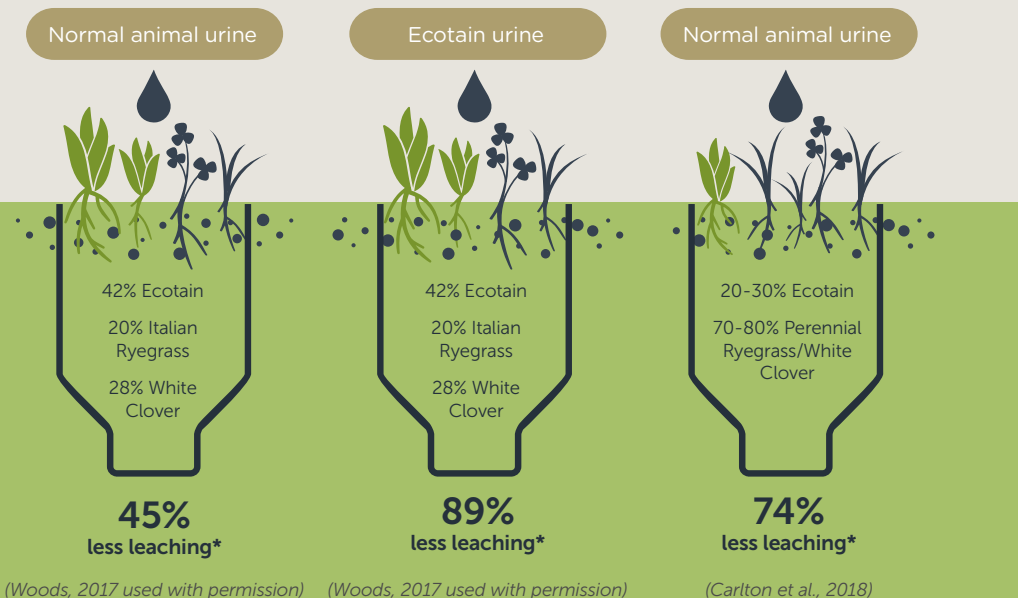
4 RESTRICT

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

The Power of 4

Lysimeters are undisturbed columns of soil which are placed into large tubes. These are often used to evaluate the effect of differing management on nitrate leaching.

The diagram below represents the outcome of a lysimeter study which demonstrated a 45% reduction in leaching when urine from animals grazing normal pasture (ryegrass/clover) was applied to an Ecotain® mix. This is the RESTRICT function at work. When urine from animals grazing the Ecotain mix was applied to the same sward, a reduction in leaching of 89% was recorded, this second lysimeter demonstrates all four mechanisms working together. The third lysimeter demonstrated a 74% reduction in leaching when urine from animals grazing normal pasture was applied to a mix containing just 20-30% Ecotain. This suggests that moderate rates of Ecotain can be extremely effective at reducing N leaching.



Performance

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 aspects Ecotain® can – Dilute, Reduce, Delay and Restrict.

In all other agronomic aspects, as well as environmental, Ecotain is an excellent example of a high quality, productive, forage.

AGRONOMIC BENEFITS

- Very similar annual DM quantity and quality to ryegrass pasture
- Increases feed quality and/or supply during summer and autumn
- Improves speed of sward recovery after summer dry
- Improves cool season activity of pasture base
- Suitable as a 2-3 year crop option
- Establishes and competes in perennial ryegrass pastures

ANIMAL PERFORMANCE BENEFITS

- Positive impact on milk production when grass quality drops in summer
- Elevated mineral content (Zn, Cu, Se, Mg, Ca, K)
- Has the potential to reduce facial eczema spore levels
- Reduces dag production in sheep
- Liveweight gain benefits with higher dressing out percentage in lambs and cattle

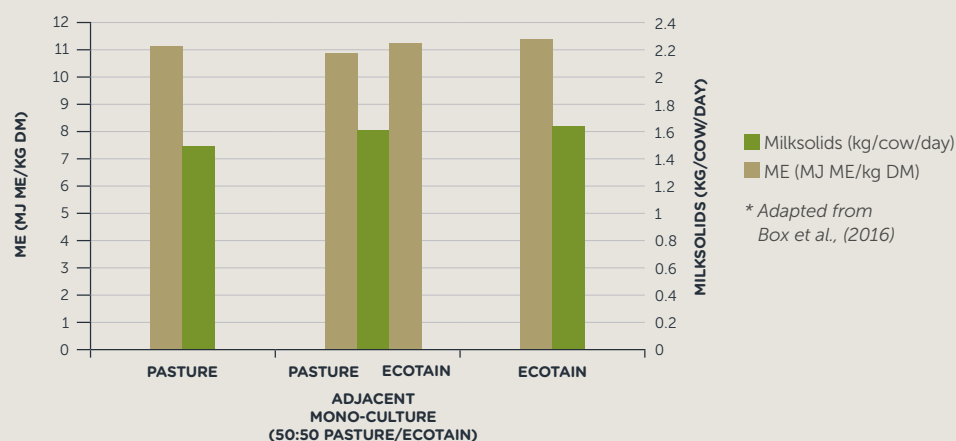


Dairy

ECOTAIN® CONTRIBUTION IN A PASTURE MIX

Milk production from Ecotain has been shown to be at least equal to that of ryegrass, or in summer and autumn it is increased (Lee *et al.*, 2015; Box *et al.* 2016).

MILKSOLIDS PRODUCTION AND METABOLISABLE ENERGY (ME) FROM A RYEGRASS/WHITE CLOVER PASTURE COMPARED WITH AN ADJACENT MONO-CULTURE OF 50:50 PASTURE (RYEGRASS/WHITE CLOVER) AND ECOTAIN, AND AN ECOTAIN PURE STAND*



ECOTAIN AS A SHORT ROTATION PASTURE*

- Ecotain 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

* Adapted from Minneé and Lee. (2012). Proceedings of the workshop "Plantain for Northland Pastures". Ecotain is a blend of Tonic and AgriTonic plantain.

Sheep & Beef

ECOTAIN® CONTRIBUTION IN A PASTURE MIX

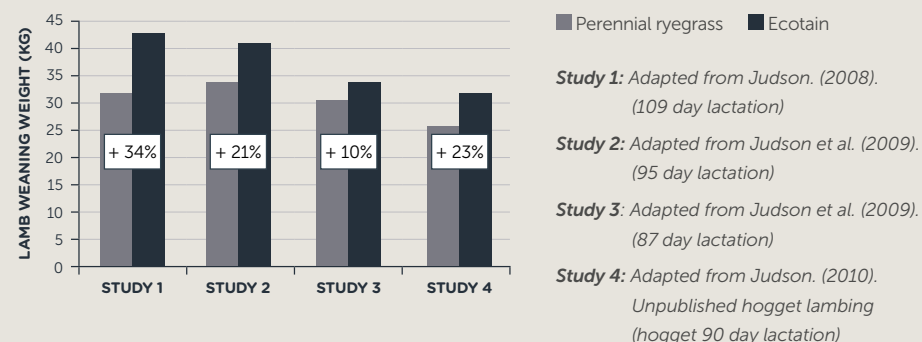
Using Ecotain to create diversity in ryegrass and clover-based pastures is one of the simplest options sheep and beef farmers have today. Ecotain is highly active and establishes competitively with ryegrass which is a major advantage to using it in a traditional pasture mix. Ecotain offers pasture diversity and yield at some very critical times, particularly summer, autumn and late winter and early spring. These periods coincide with the need for improved summer liveweight gain on finishing stock or hoggets, quality mating feed in autumn and critical lambing feed in early spring.

ECOTAIN AS A SHORT ROTATION PASTURE

Pure stands of Ecotain can be used during lambing to increase lamb and ewe weights at weaning. The key to this use is the unique trait of high winter and early spring growth compared to other plantains.

- High dressing out percentage in cattle and sheep
- Ideal grass alternative (substitute) for creating and maintaining high legume content pastures
- Fast recovery from hot dry summer conditions
- Drymatter production through autumn, winter and early spring similar to perennial ryegrass
- Reduced dag production in sheep
- High mineral supply of copper and selenium

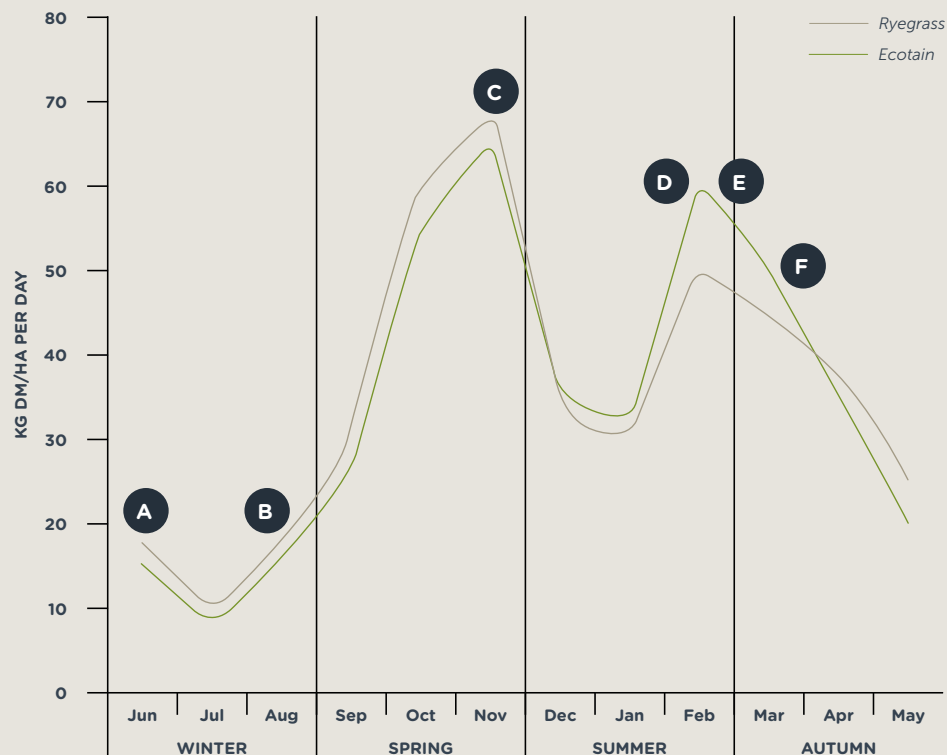
WEANING WEIGHT DIFFERENCES OF LAMBS BORN, GRAZED AND WEANED FROM PERENNIAL RYEGRASS OR ECOTAIN STANDS FROM FOUR STUDIES



Ecotain is a blend of Tonic and AgriTonic plantain.

Seasonal growth & animal systems fit

DEMONSTRATION OF ECOTAIN® AND PERENNIAL RYEGRASS SEASONAL GROWTH CURVE BASED ON AN ANNUAL YIELD OF 12,000 KG DM/HA (BOTH SPECIES) FROM AN EARLY AUTUMN SOWING



Ecotain genetics are upright and winter active



Winter growth important for early lambing cover for set stocking and first round grazing in dairy pasture



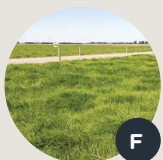
Primary time for seedhead production



Ideal as a spring sown cropping option or to add value in a summer dry pasture



Outstanding summer recovery



Provides benefits when urine patches have greater risk of leaching in late autumn

DEPLOYMENT & ESTABLISHMENT

New Pasture



DEPLOYMENT

Include 4 - 6 kg/ha of Ecotain® in your perennial pasture mix

Include 6 - 8 kg/ha of Ecotain in your Italian or hybrid pasture mix

KEY POINTS

- Adding Ecotain to a new pasture is the most reliable establishment method for maximising Ecotain content in a mixed pasture
- Environmental effectiveness of young pastures is very high
- It will take time to get Ecotain across a farm system as it is limited by farm pasture renewal rate (industry average is 8-14% of farm per annum)

ESTABLISHMENT PROCESS

- Manage all hard-to-kill weeds prior to sowing
- Establish pasture mixes with Ecotain the same as you would a ryegrass/white clover pasture
- As with best practice establishment for white clover, sow at 10 – 15mm in depth
- Apply establishment fertiliser – nitrogen (N) for rapid establishment and phosphate for long-term production (DAP is generally applied at a rate of 200-250 kg/ha at establishment)
- First graze at six weeks following sowing and apply nitrogen after each grazing

PRE-MIXES AVAILABLE:

Ecotain perennial mix

18 kg ONE⁵⁰ perennial ryegrass with AR37

4 kg Ecotain

3 kg Tribute Superstrike

Ecotain Italian mix

18 kg Asset Italian ryegrass with AR37

7 kg Ecotain

DEPLOYMENT & ESTABLISHMENT

Undersow



DEPLOYMENT

Direct drill 4 – 8 kg/ha of Ecotain® into damaged or open pasture with or without Italian ryegrass

KEY POINTS	ESTABLISHMENT PROCESS
<ul style="list-style-type: none">• Best practice for extending the life of pastures• Complementary to current undersowing practices• Ecotain can also be added to perennial ryegrass or Italian ryegrass and clovers for undersowing	<ul style="list-style-type: none">• Select damaged or open paddocks and then graze prior to undersowing• Manage all hard-to-kill weeds prior to undersowing• Some environments may require slug bait and/or treated seed• Drill at 10 – 15mm in depth

DEPLOYMENT & ESTABLISHMENT

Broadcast



DEPLOYMENT

Broadcast 4 – 8 kg/ha Ecotain® into damaged or open pasture

Prillcote® treated Ecotain seed rate of 8 - 16 kg/ha

KEY POINTS	ESTABLISHMENT PROCESS
<ul style="list-style-type: none">• Success is based on openness of pasture (proportion of open ground)• Ideal quick fix for winter and spring damaged pastures to extend their life• Useful addition when applying fertiliser	<ul style="list-style-type: none">• Select open paddocks and then graze prior to broadcasting• Manage all hard-to-kill weeds prior to broadcasting• To avoid banding across the paddock, use Prillcote® treated seed

DEPLOYMENT & ESTABLISHMENT

Ecotain® Dominant



DEPLOYMENT

Sow 12 kg/ha of Ecotain

KEY POINTS

- Provides high and consistent levels of Ecotain content
- Fits very well as a short rotation pasture as a break crop in a pasture renovation programme (similar in use to Italian or hybrid pastures)

ESTABLISHMENT PROCESS

- Plan to plant pasture when soils are 10-12° C and rising
- Spray out existing pasture
- Apply establishment fertiliser – nitrogen (N) for rapid establishment and phosphate for long-term production (DAP is generally applied at a rate of 200-250 kg/ha at establishment)
- Monitor weeds and if found contact your local retail representative. Clean the tank thoroughly before adding water/chemical, and maintain agitation while spraying. If grass seedlings are also present (e.g. summer grasses), a grass-specific herbicide should be added to the mix
- Apply nitrogen 3-4 weeks after planting, then after each grazing
- First grazing of the whole paddock should occur when plants have seven true leaves (the crop will be about 25 cm high), and aim to leave a 3-5 cm residual

DEPLOYMENT & ESTABLISHMENT

Ecotain® Dominant (with Clover)



DEPLOYMENT

Sow 12 kg/ha of Ecotain and 4 kg/ha of white clover

KEY POINTS

- Increases productivity over Ecotain dominant stands but decreased weed control options
- High per head and per ha performance vs conventional pasture
- Ideal for 2-3 year lactation feeding or an inter-crop restorative phase
- High mineral content and good shoulder season growth
- Suppression of weeds naturally when fertility and establishment optimised
- Ideal tool to break grass weed lifecycles with use of grass specific herbicides
- Less reliance on applied nitrogen and lower kg/DM costs vs Ecotain dominant option

ESTABLISHMENT PROCESS

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Pasture Management

GRAZING

- Ecotain® environmental plantain contributes to DM production in all dairy based grazing rotations and is capable of round lengths of 14-30 days.
- Ecotain contributes to DM production in sheep systems, particularly under rotational grazing, but is tolerant to periods of set stocking.
- Avoid grazing rotations in late spring and summer extending beyond 25 days as this may lead to lignified stem and seedhead.
- In these situations a build-up of stem increases the dead material which may lead to increased disease loading, impacting on plant persistence. It can also increase the risk of plantain moth in drier months.

CONSERVATION

Reductions in urinary nitrogen concentration are also possible where Ecotain is being fed as silage. Where 3 kg of Ecotain silage was fed as part of a kale diet to dairy heifers, urinary N was lower than heifers fed kale and ryegrass baleage (adapted from Judson & Edwards, 2016).

WEED CONTROL

- Pastures with Ecotain or specialist stands may require attention to specific weed control prior to sowing.
- Where registered herbicide options may be limited for specific weed problems, management practices such as topping and weed wiping should be used.

At time of publication there are two registered chemicals available. These products have specific labels, always adhere to them.

SUITABLE FOR	T MAX™	DYNAMO®
	Ryegrass only and Ecotain (no clover)	Ryegrass / white clover and Ecotain
	Ecotain only (no clover)	Ecotain and white clover

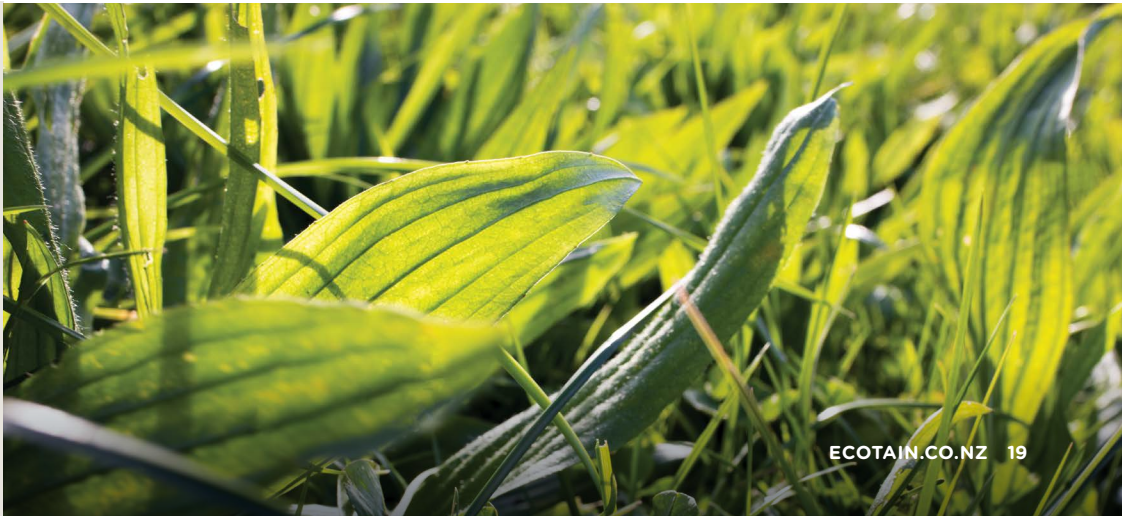
PESTS

Native grass grub & Porina

- In general, perennial pastures can be susceptible to native grass grub and Porina. Although all pasture species will be affected, Ecotain® (due to its upright growth habit and physical size in relation to other species in the sward) results in more obvious symptoms. The decline in content will be most noticeable through April-August often in the second or third year.
- Porina control is often highly effective, but needs to be carried out early in the autumn to prevent damage, rather than later in autumn when the damage is already done.
- For grass grub, insecticide use and management practices such as heavy rolling in late March or early April, are feasible options.

Plantain moth

- In Ecotain dominated pasture swards the plantain moth may occur, especially in dry conditions. It is typically a problem in older stands and damage is associated with a considerable amount of dead material being present.
- Cleaning up pastures in summer to reduce dead material and spraying with suitable insecticides as numbers build in February are primary management tools.





BROUGHT TO YOU BY:



Phone 0800 183 358

Visit ecotain.co.nz

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