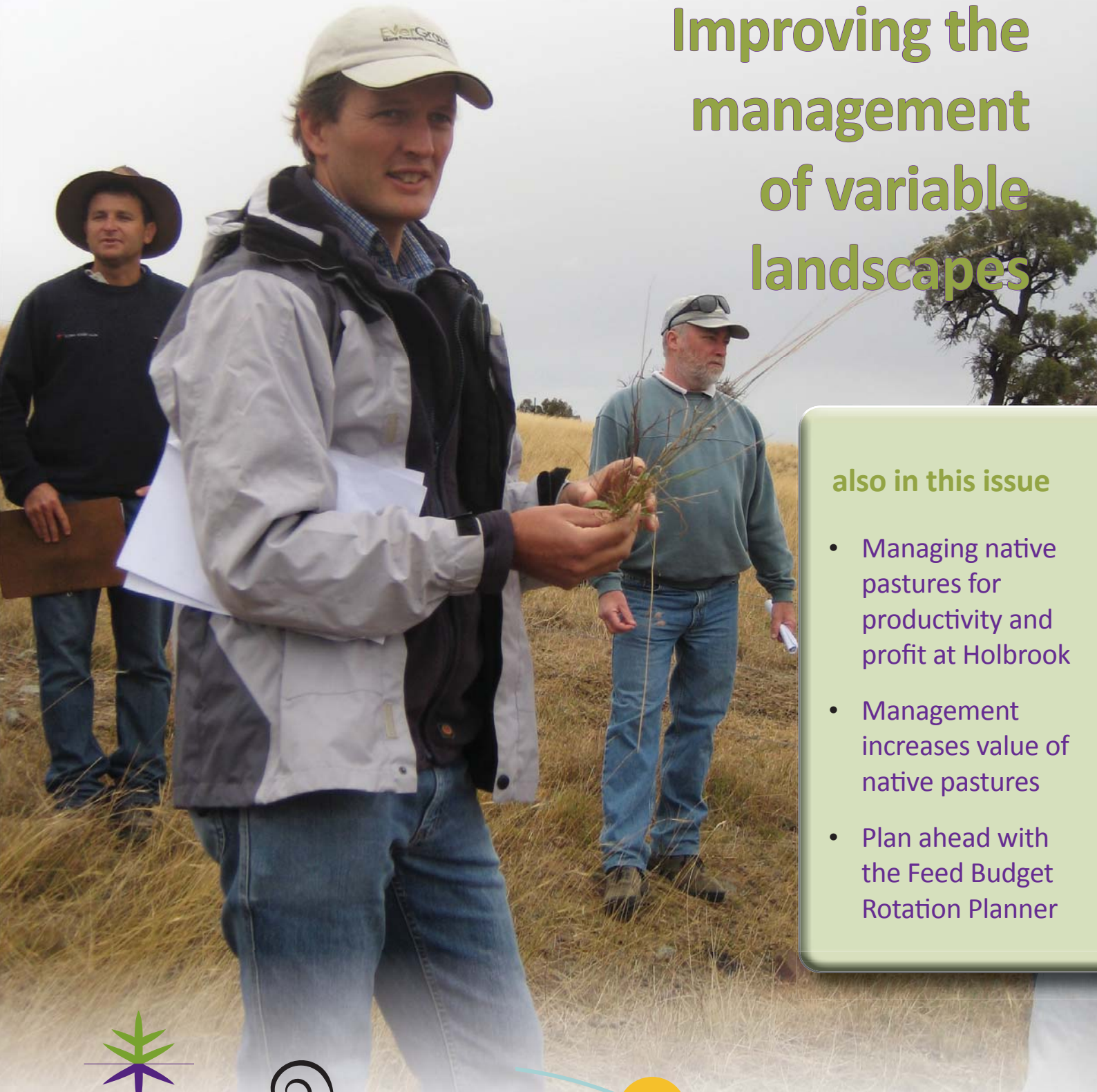
June 2012

EverGraze

More livestock from perennials

Update

Improving the management of variable landscapes



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Improving the management of variable landscapes

In high rainfall zones of south-east Australia, native pastures often represent a significant proportion of the farm and are generally found in landscapes that are highly variable in soil depth and fertility.

When large native paddocks are continuously stocked, patch grazing occurs leading to over utilisation in some areas and under utilisation in others.

Identifying production zones across the landscape and fencing to these zones makes it possible to introduce a flexible grazing rotation, resulting in the ability to better regulate grazing, improve overall utilisation, increase profitability and reduce degradation.

Key points

- Intensive rotational grazing (20 paddocks) improved pasture utilisation compared to one paddock and four paddock systems in a variable landscape.
- The 20 paddock system was more profitable due to increased stocking rates.
- The 20 paddock system improved groundcover, but flexible management (varying stocking rate and confining and feeding animals in dry seasons) maintained adequate groundcover in the one and four paddock systems.

An EverGraze Proof Site at Panuara near Orange NSW, was able to quantify improvements and determine whether it is profitable and practical to use a flexible rotational grazing system.

The comparisons

The Proof Site investigated how increasing the intensity of grazing management from continuous grazing in one paddock (1P) to flexible four paddock (4P) and 20 paddock (20P) rotational systems influenced profitability and environmental outcomes for a Merino x terminal sire lamb production system run on native pastures. The research also examined the interaction between grazing management and landscape position.

To do this the site was initially divided into high (HPZ), medium (MPZ) and low (LPZ) production zones, based on the capacity for pasture growth (Fig. 1 & 2).

The HPZ was on the lower slopes and was generally dominated by weeping grass (*Microlaena stipoides*), Yorkshire fog grass (*Holcus lanatus*), annual ryegrass (*Lolium rigidum*) and sub clover (*Trifolium subterraneum*).

The MPZ was mid slope and had wallaby grass (*Austrodanthonia spp.*), redgrass (*Bothriochloa macra*), annual ryegrass and catsear (*Hypochaeris radicta*).

The LPZ was on the ridgelines and had wallaby grass, corkscrew (*Austrostipa spp.)*, redgrass and catsear. Each system was estimated to have the same area of HPZ, MPZ and LPZ.

Differences in the production zones

The highly variable landscape in this experiment not only influenced the total production of pastures but also the timing of growth.

On average the HPZ, MPZ and LPZ grew 10, 6 and 4 tDM/ha/yr respectively.

The difference in pasture growth was due to a lower capacity for the soil to store moisture. After rainfall, the LPZ initially grew as quickly as the HPZ and MPZ, but soils dried out quicker and growth ceased earlier. For example, in August 2009, pasture growth was on average 27kg DM/ha/day in all production zones. After a month with minimal rain, growth had slowed to 6kg DM/ha/day in the LPZ but was still 50 and 21kg DM/ha/day in the HPZ and MPZ respectively.

Figure 1. High (HPZ, left), medium (MPZ, middle) and low (LPZ, right) production areas at Panuara.

Grazing system, utilisation and profit

Has grazing management been able to improve the utilisation of pastures?

The 20P system had higher feed on offer (FOO) across the entire system from November 2008, and stocking rate was increased from February 2009 in response. While per head production decreased from the 1P to the 4P to the 20P, lamb production per ha was greatest in the 20P in 2008 and 2010.

In 2008 this was due to lambs being retained on treatments for longer and in 2010 it was due to higher stocking rates. See Table 1.

Intensive rotational grazing has improved the utilisation rather than the growth of pasture and this has in turn reduced per head production, but increased per ha production.

Profit was only influenced by grazing system in 2010 (20P = $581/ha, 4P = $485/ha and 1P = $371/ha) when higher stocking rates were run with more intensive rotational grazing and lambs were retained after weaning.

Table 1: Stocking rates (DSE/ha) at Panuara EverGraze site

Production year	1 paddock	4 paddocks	20 paddocks
2008	9.0	9.4	9.5
2009	5.1	5.5	6.6
2010	5.0	6.4	7.7

Profit could be increased by switching between grazing systems. When feed availability is higher (e.g. spring), set stocking can improve per head performance, but when forage is limited (e.g. autumn) the rotations help to regulate grazing and improve utilisation so that a feed wedge is developed and higher stocking rates can be maintained.

Grazing system and ground cover

From an environmental point of view the 20P maintained higher groundcover compared to the 1P and 4P, but this was mainly in summer and autumn (2009: 20P = 91%, 1P and 4P = 82% and 2010: 20P = 88%, 1P and 4 = 82%) and the groundcover was rarely at unacceptable levels (<80%) in the 1P and 4P systems.

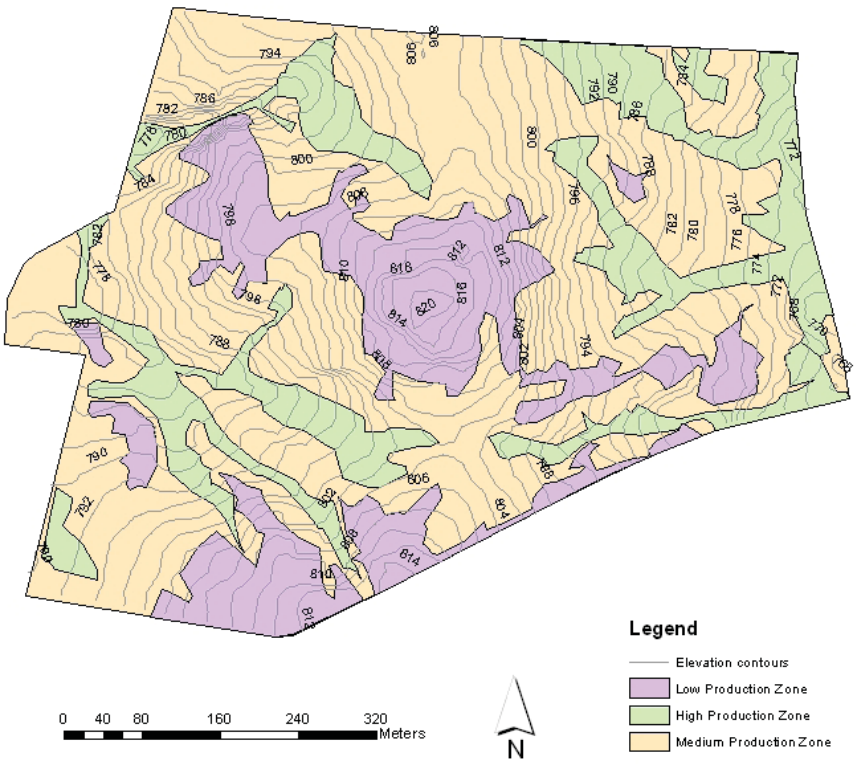
It was thought the LPZ would be more susceptible to degradation under continuous grazing, as grazing pressure can be reduced with rotational grazing. However, there was no difference between treatments at any time in the low production zone.

The differences in groundcover were in the MPZ and HPZ.

Soil water, erosion, pasture composition and perennial grass basal area were not influenced by grazing system.

This is probably due to the high density of perennial grasses present at the beginning of the experiment, and the flexible management (varying stocking rate and confining and feeding animals in dry seasons) imposed on all systems to maintain >80% groundcover and >800 kg DM/ha FOO which prevented degradation.

Figure 2. Map of the Panuara site showing production zones and elevation contours.



For further information on grazing management, download our EverGraze Exchange - Grazing management systems explained from www.evergraze.com.au

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Managing native pastures for productivity and profit at Holbrook

Managing native pastures must be considered within the whole-farm context because timing of grazing and rests will have implications for how the rest of the property is managed.
The EverGraze team at Holbrook undertook research to determine how native pasture management can increase overall farm profitability without damaging the native grasses.
To understand the results we first need to address three key questions:
What is a native pasture?
How can profitability be improved on native pastures?
What is the most appropriate grazing management strategy for native pastures?

What is a native pasture?

Native pasture is 'any pasture where the main perennial species is a native grass'.

After decades of widespread grazing in southern Australia, there have been considerable changes in native pasture composition. Many native species have declined and in some cases natives have disappeared altogether, while some exotic species (particularly annual species) have successfully increased.

Native pastures are often described as the 'unimproved' parts of the farm.

Improving profit on native pastures.

There are three ways in which profit can be improved on native pastures: grow more, utilise a higher proportion and/or graze with higher value livestock.

Fertilising native pastures will improve productivity but it is important to note that much of the response to fertilisers comes from the naturalised exotic species rather than the natives.

This presents a difficulty when competition from fertilised annuals threatens the perennial native pasture.

The benefits of using fertiliser must be captured by utilising the extra growth, which means increasing stocking rate.

Native pastures at Holbrook

Increasing utilisation is the cheapest way of improving profitability in grazing systems but careful monitoring is required to ensure the pasture composition and persistence of the native perennials is not compromised.

A traditional approach to grazing the native pastures has been to set stock with wethers and run a low input-low output operation. An alternate approach would be to increase pasture growth and quality with phosphorus fertiliser and utilise native pastures with higher value breeding stock, particularly to utilise the extra growth that resulted from raising soil fertility. So what would such a system look like?

Grazing management of native pastures

We need to ensure that any system of grazing management results in efficient utilisation of pasture, protection of natural resources and results in a profitable outcome.

One vital principle is that perennial species are favoured by rest periods from grazing. The timing and frequency of rests will depend on the species.

We know that many native species rely on a seed bank to ensure persistence.

Grazing management should include rests to favour perennial grasses and timing some of those rests to ensure that seeds are produced and that they are given the opportunity to establish.

Maximum growth of annuals occurs during early spring and if left unchecked could result in dominance over native grasses. So grazing over this period can be used to influence the balance between native grass and annuals.

EverGraze experiment at Holbrook

The EverGraze experiment at Holbrook was designed to address these issues in a whole farm context.

Three different production systems were evaluated during the project and are represented in Figure 1.

The traditional approach of placing higher value breeding stock on improved pastures (a phalaris/cocksfoot/ sub clover pasture) with lower value dry stock (wethers) on native country (Separate treatment) was compared against a single breeding flock that would graze across both pasture types (Integrated). Merino ewes (Centre-plus) put to terminal sires were used in both systems with Merino wethers also being used in the separate treatment.

A further treatment was added to the Integrated approach by having the native pasture either fertilised (+F) or not (-F), although this latter treatment did not operate in the first year. The native pasture was a diverse mixture of spear, wallaby, weeping (*Microlaena*), red and common wheat grasses with annual species such as sub clover, vulpia, barley grass, Paterson's curse and capeweed.

Phalaris pastures were subdivided into four and grazed on a two week on, six week off basis. In the Separate treatment this management was applied throughout the experiment.

In addition, wethers were set stocked on the native pasture at rates from 3-5 DSE/ha throughout the experiment. In the Integrated treatments, ewes and lambs were moved after marking onto the native plots (usually mid-October) to increase grazing pressure on annual species. Thereafter, they returned to the phalaris. In 2008 and 2009 lambs were sold after weaning and ewes remained on the phalaris until late summer.

Figure 1 - Treatment systems at Holbrook site

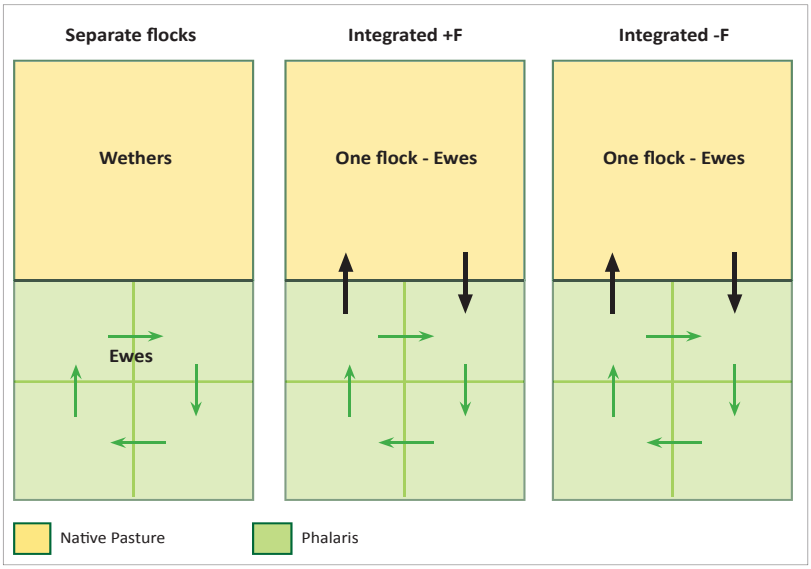
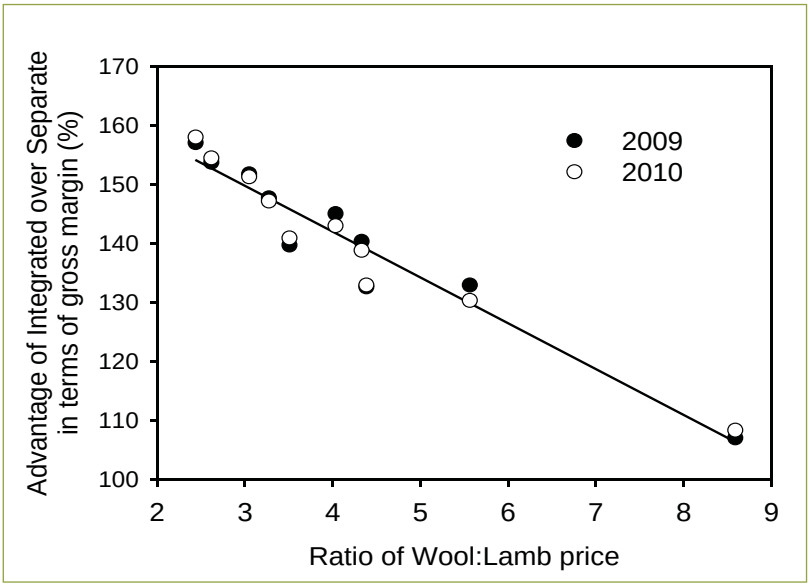


Table 1 -Stocking rates for the different treatments from 2008 to 2010

	2008	2009	2010
Separate	8.3	5.3	7.4
Integrated +F	8.8	5.3	8.0
Integrated -F	8.5	5.0	7.7

Figure 2 - Gross margin of the Integrated+F treatment compared to the Separate treatment versus the wool:lamb price ratio.



Early autumn grazing of the native plots took place to utilise any green feed. In 2010 the lambs were weaned onto the phalaris pasture in late December and ewes left on the native pasture until early February. The only other time the native pasture was grazed was for a short spell in mid winter, as dictated by feed availability and quality.

Stocking rates varied and are shown in Table 1.

Results

To analyse the results of this experiment we used the production figures from each system and then produced a gross margin using standard costs on each plot. We then performed a traditional statistical analysis on the gross margins using a range of price combinations for lamb and wool that occurred over the last 30 years. In almost all cases there was a significant advantage to Integrated grazing over the Separate treatment. Only when the ratio of wool:lamb price was high did the advantage disappear (Figure 2).

Lambs grazing native pasture in spring were able to grow as well as those grazing the improved phalaris pasture due to the fact that the native pastures had been rested over winter and had accumulated sufficient feed to allow lambs to select an adequate diet.

In contrast to much of the historical data, the two grazing regimes did not affect composition or ground cover of the native pastures. The expectation was that set-stocking wethers in the Separate treatment would favour annual species but this did not occur. Our interpretation of this is that seasons had a greater influence on the pasture composition than grazing management, especially the extraordinary high summer-autumn rainfall of 2010 and 2011. It was clear that on the site as well as most of the surrounding countryside, native species thrived in these conditions. Basal cover of native species had declined regardless of treatment from 2008-2010 but increased back to pre-experiment levels in 2011.

The lesson we should take from this is that as long as we are careful to look after the native pasture species, they will be resilient and have the capacity to respond when conditions improve.

For more information on native perennials visit www.evergraze.com.au

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Management increases value of native pastures

Grazier Ian Locke from Holbrook in southern NSW has tried a number of tactics to utilise the rougher, more native portion of his undulating property. Ian has gradually developed an understanding of how best to graze and manage his native pasture species to promote production and persistence. As a result, he has reduced fertiliser and weed control costs on his native country while maintaining annual stocking rates by strategically grazing his native pastures as part of his integrated, whole farm production system.

EverGraze Case Study

Producer: Ian Locke

Location: Holbrook, New South Wales

Property size: 1520 hectares

Enterprise: beef cattle, prime lamb

Cattle and sheep grazing on Ian Lockes property at Holbrook, NSW

Our property is located in a winter-dominant rainfall area, where spring rainfall events are traditionally very reliable. In contrast, 60 percent of our autumn breaks fail to materialise.

As we grow 80 percent of our pasture in spring, we calve, lamb and grow out animals during this season to best match our pasture production curve.

Our cattle and sheep breeding enterprises are pushed as hard as we can, with performance per hectare the focus rather than production per head.

If the season allows, we background feeder steers to utilise surplus feed from July until December.

Powerful pastures

About 80 percent of the property has been improved and sown down to perennial pastures. These are predominantly phalaris and sub clover.

We also have some 'feed gap' pastures such as lucerne, ryegrass and forage rape, and sow small areas of grazing crops such as oats and triticale as a form of weed control to later establish permanent pasture.

Native pastures

Native based pastures make up 15 percent of the property, including the steep and often rocky hill country.

The native hill country initially bore the brunt of our high stocking rate regime by being heavily grazed with dry sheep.

The pastures would soon be grazed bare, exposing the soil to erosion from summer storms and creating ideal conditions for rampant broadleaf weeds such as Paterson's curse. Our management of the existing native pastures had to change.

Management the key

After scrutinising some alternate grazing systems being used by producers and trialling 'crash grazing' techniques in various treelots and fenced off areas of the property, we were keen to try a new management regime.

From our studies, we believed we could maintain production from our native country with no inputs by grazing it with large mobs of stock at specific times of year.

The hill country is destocked from late spring through to autumn each year, to allow the predominantly summer active native species such as red grass and Wallaby grass to grow and set seed.

From mid-May to July, 500 spring-calving cows and heifers graze the hills to chew back the mature, mostly low-quality standing feed. This herd is removed in the third week of July, about a month before they start calving, to maintain their nutritional requirements.

Three months later in late October, sheep or backgrounding cattle are introduced to utilise the higher quality native grasses (such as *Microlaena*) and heavily graze the exotic annuals such as clovers, broadleaf weeds and grasses.

Many benefits

This grazing regime on the native hill country is paying off in terms of maintaining excellent groundcover for most of the year.

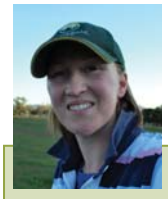
The heavy grazing in late spring followed by total destocking creates space for the summer active native perennials to grow and establish, inhibiting the broadleaf weeds which were typical in autumn.

The constant groundcover has improved moisture retention, resulting in the environmental benefits of more diverse and healthier plant life.

From an economic point of view, we have increased our average annual stocking rate in our native country from 5.6 to 6.1 DSE/ha while eliminating all costs associated with using aerial fertiliser and herbicide.

The hill country is now effectively a winter haystack of low quality feed, ideal for the spring-calving breeders.

Destocking of our improved, phalaris-based pastures over late-autumn and winter gives these pastures a chance to gain sufficient leaf area after the autumn break. This ensures excellent productivity over late winter and spring to coincide with peak animal production.



See our other case studies at www.evergraze.com.au/fact-sheets

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Plan ahead with the Feed Budget Rotation Planner

The new version of the EverGraze Feed Budget Rotation Planner is now online at http://evergraze.com.au/tools.htm

The EverGraze Feed Budget Rotation Planner can help you to plan your grazing system. Using its various tools you can;

- determine appropriate stocking rates,
- calculate pasture growth rates,
- estimate how long your paddocks will last,
- calculate the most economical ration,
- record grazing days and maintenance fertiliser requirements for each paddock.

The summer budget is a useful tool to use during spring to see whether you will have enough Food on Offer to see you through summer and to the autumn break. If in a deficit, you can then use the Develop a Feed Ration tool to help calculate the supplementary feed requirements of your stock.

The winter budget is useful for determining the amount of feed needed throughout autumn (autumn feed wedge) to get your livestock through winter. It helps you to develop trigger points throughout the autumn period for monitoring whether you are on track with your feed production.

Use either of the two Rotation Planners to get started with a grazing rotation for your property.

The Rotation Planner based on Food on Offer gives an indication of how long to leave stock in paddocks and next move dates based on animal requirements and pasture persistence measures.

The Rotation Planner based on plant recovery estimates paddock movements based on the rotation length as determined by the number of days it takes the perennial plant species in your system to reach leaf maturity.

Both planners are excellent tools for helping to take some of the guess work out of planning a rotation.

EverGraze is conducting workshops for producers and advisers for development of feed budgets and tactical management plans using the tools. Contact your Regional Coordinator if you would like to attend a workshop.

For more information, contact your local Regional Coordinator or Kate Sargeant. Contact details are on the back page of this Update.

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Diary dates

Thursday 5 July	**Nuts and Bolts of Grazing Management course** Ararat, VICTORIA	Rob Shea P: 0438 521 357 E: yadin@netconnect.com.au

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Front cover photo: Dr Warwick Badgery at a field day at the Panuara Proof Site

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