

EverGraze native perennials research

This edition of EverGraze Update focuses on the results of research on native pastures in northern Victoria and the slopes and tablelands of NSW. Native pastures make up a large proportion of this region where shallow soils, soil acidity and physical limitations make introduced species impracticable and unprofitable.

Research at Chiltern and Orange is studying the way that different grazing systems from set stocking through to intensive multi-paddock systems can improve pasture utilization. Typically native pastures vary in both the mix of species and landscape. It could be expected that some form of rotational grazing would improve utilisation compared to set stocking where sheep in particular will overgraze some areas and avoid other parts. While it is still early days, the results suggest higher production per hectare but slightly lower production per head when using intensive grazing systems.

A second theme is how phosphorus fertilizer can be used in conjunction with rotational grazing to boost production and quality without damaging the natives. Previous work with fertilizer under set stocking on native pastures has seen a decline in desirable perennials. The question is - is it possible to have your cake and eat it!!

The third theme is work at Holbrook and Tamworth looking at the benefits of integrating areas

of native pastures with areas of improved pastures or forage crops within the area grazed by ewes.

The results highlight variability in how native pastures suit prime lamb production. In Northern VIC, Southern and Central NSW, natives are mainly temperate species (e.g. Wallaby grass, Weeping grass), that tend to be higher quality and provide forage to suit late winter -spring lambing. Where sub clover and fertiliser have been used to improve soil fertility and winter feed, it has also increased the proportion winter active annual grasses. Summer dominant rainfall in Northern NSW leads to native pastures dominated by summer active perennials, Red grass, Queensland bluegrass, wiregrass etc. These species generally produce lower quality feed and less green feed in winter compared with temperate native grasses. Native pastures are commonly oversown with subterranean clover in this region but recent dry autumns and excessive summer growth have lead to poor clover years, resulting in insufficient green feed to meet requirements for lambing ewes. Options such as improved tropical grasses, lucerne and perennial grasses, forage crops (eg.oats) sown into native grasses can be used to enhance the overall quality of the forage available for livestock.

We trust that you enjoy this edition of EverGraze Update and welcome any feedback via email at info@evergraze.com.au

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For further information

Geoff Saul,
National EverGraze Coordinator,
P: 0419 328 590
info@evergraze.com.au

Angela Avery,
EverGraze Research Leader,
P: 02 6030 4578
angela.avery@dpi.vic.gov.au

Gill Fry,
EverGraze National
Communications Coordinator,
P: 03 5573 4539
gill.fry@networksw.com.au

Visit the website:
www.evergraze.com.au

Rotational grazing on native pastures at Orange

At the Proof Site near Orange NSW, the team is testing whether increasing the intensity of a grazing system (1, 4 and 20 paddock systems) in diverse native pasture improves profitability and natural resource outcomes.

Production systems

The systems being tested include;

- ▶ **1 paddock**, or set stocking
- ▶ **4 paddock rotation** and
- ▶ **20 paddock rotation**.

Optimising stocking rate is essential for a profitable grazing system as stocking rate drives production of meat or wool per ha, which in turn is related to profit per ha.

In the first year, all systems were run at the same stocking rate (9.4 DSE/ha, 5.4 ewes/ha) to determine the magnitude of differences in Food on Offer (FOO) and ground cover between systems, which allowed an objective adjustment to stocking rates for individual plots in year two.

In the second year, stocking rates were adjusted based on FOO at joining in March. Stocking rates averaged 5.7, 6.1 and 7.8 DSE/ha for the 1, 4 and 20 paddock systems respectively. Gross Margins were determined for 2008 and 2009 (see Table 1).

The Gross Margins calculated from the trial paddocks were estimated to be greater than the district average for similar land to the experiment. However, there is only one year's data from the optimised stocking rates and wool data is not available until after shearing.

The lamb sales were staggered in 2008 and stock from individual plots were sold when average lamb growth rate was <100 g/day or lambs reached a live weight of 40 kg (see Table 2).

Lambs on the 20 paddock system initially grew slower than the other systems, but greater FOO late in spring from this system allowed them to be retained on plots for longer and to be grown to heavier weights.

Latest results:

The 20 paddock system has been able to run higher stocking rates than the 1 and 4 paddock systems. However, the 20 paddock system has lower individual animal performance than set stocking when there is adequate FOO.

Both lamb growth rates and ewe condition scores were higher in the set stocking system.

There has consistently been greater ground cover and FOO in the 20 paddock system than the 1 and 4 paddock despite higher stocking rates since March 2009. Ground

key research

- ▶ Lamb production can be profitable in native pastures.
- ▶ The 20 paddock system is able to run higher stocking rates than the 1 and 4 paddock systems.
- ▶ However, the 20 paddock grazing system has lower individual animal performance

cover has been maintained at around 90% in the 20 paddock system. The main benefit in ground cover between the 1 and 20 paddock system has been in the low and medium slopes with the ridge lines having less cover across all systems.

In the experiment, a greater biomass of native perennial grasses has been maintained in the 20 paddock system than the 1 and 4 paddock systems (1130 v 735 kg/ha).

Results to date show that natural resource measures, such as groundcover, sediment movement, water quality and quantity, soil nutrients and species diversity, are more influenced by landscape (lower slopes vs ridge lines) than grazing management.

Conclusion

Lamb production systems can be profitable in native pastures in NSW. All systems provided good returns and are likely to be more profitable than wool production systems traditionally run on this class of country.

It is still too early to draw out definite conclusions on production and natural resource changes. The 20 paddock system seems better for some environmental factors. While it also appears that this system will allow higher stocking rates to be maintained, further results are needed to fully document the tradeoff in

production per head and carrying capacity.



contact

Warwick Badgery

P: 02 6391 3814

warwick.badgery@industry.nsw.gov.au

Table 1. Comparing Gross Margins for 2008 and 2009

Gross Margin /ha	20 paddock	4 paddock	1 paddock
2008	\$479	\$473	\$460
2009	\$317	\$281	\$301

Table 2. Production data for 2008-09

Year	System	Lamb (kg/ha)	Lambs/ha	Weaning weight (kg)	Sale weight (kg)
2008	1 paddock	209	5.6	34	37
	4 paddock	200	6.3	30	36
	20 paddock	223	5.4	33	40
2009	1 paddock	176	5.6	31	31
	4 paddock	161	5.6	29	29
	20 paddock	188	7.1	27	27

Weaning weights; Lambs were weaned on 15/12/08 and 15/11/09 (and sold)

Time planned rotational grazing helps environment aims

farm info.



Time planned rotational grazing is one tool that John and Megan Rowlands are using to achieve long term sustainability on their farm 'Hilton' at Mandurama, NSW. They shared their experience with Gill Fry.

"I think it was about 10 years ago we realised we needed to change what we were doing. We were high input, the costs were increasing more than the returns.

We attended a couple of courses including grazing for profit and holistic farm management and it developed from there. We completed a three year executive link program where we joined a board of other producers to share ideas and get feedback on our own business. The networking was great and we were surrounded by like-minded, positive people. The more people can share ideas and look at things in a different light, the better.

Our aim now is to have the soil and environment in a much healthier state and be sustainable in the long term. We want to be in a position to hand on the farm in a better condition. To do this we have recognised that for us it is about good business management coupled with land management. The real challenge is to be a viable business and improve the landscape as much as we can and remain healthy and happy.

Our grazing management is one of the things helping us to achieve our aims. On the grazing side we aim to have 100% ground cover all of the time. We do this through time planned rotational grazing. We use grazing charts as a tool to match our stocking rate to our carrying capacity.

We graze our native pastures in the rotation. We graze the natives all

Cattle at the salt cart on 'Hilton'



Producer: John and Megan Rowlands

Location: 'Hilton', Mandurama, north of Cowra, NSW

Property size: 700 ha

Enterprises: Cattle breeding, Charolais-angus cross

Pastures: Native pastures, phalaris, fescue, cocksfoot, ryegrass

year round but we do drop them out of the rotation if they need more rest. We try to look after them a bit more than the introduced species. They need a longer recovery period after grazing than introduced perennials. We have summer native pastures so they respond to summer rain and need more rest in spring.

For our farm, planning is one of the most important things. We have a written plan which is constantly monitored and revisited. We work to keep costs to a minimum and have a simplified management system. We find it is very important to make a decision, monitor the decision and if it is not going in the right direction make another decision. This way we are in control of the things we can control. For example if our carrying capacity is dropping, we sell the cattle while they are still in good condition and saleable rather than drought feed.

We have noticed with our grazing management that the weeds have reduced. The Patterson's curse is still there but doesn't flower much now. It has decreased by an incredible amount.

The last few years have been dry but we have got through because we have grass. It has got down to 80% groundcover which is below what we would like. But we haven't supplementary fed.

One disadvantage we can see about time planned rotational grazing is you have to be committed. You can't just trial it for a while and forget it. It's not for everyone, but people who do it seem to stick with it.



Megan and John Rowlands

key points

- ▶ 100% groundcover can be achieved through time planned rotational grazing.
- ▶ Native pastures need a longer recovery period after grazing than introduced species
- ▶ You need to be committed to take up rotational grazing. It's not something you can trial for a while and forget.
- ▶ Monitor, revise, act.

There is no set way of doing things. Everyone is different, every farm is different. It's more about your own business goals and working to achieve the outcomes. We've found that time planned grazing is one of the management tools helping us achieve our business goals. We believe it is important to remain open minded and continue to learn. Our challenge is to optimize our environmental goals with our financial goals."

contact

Luke Beange

P: 02 6881 1294

luke.beange@industry.nsw.gov.au

NE Victorian research shows native pastures have a place

As part of the Albury Wodonga Proof Site, EverGraze has a grazing experiment, which is comparing the profit and environmental outcomes using rotational grazing and fertilizers on native pastures.

The Proof Site, located near Chiltern has twelve 3 ha plots.

The research is determining if it is possible to increase the profitability of native pastures and for the native perennials to persist when phosphorus fertiliser (superphosphate) is applied together with appropriate grazing management.

The Chiltern site has good existing balance of native grasses (Wallaby grass, Weeping grass) within the pasture. The experiment started in autumn 2008 but results have been affected by the prolonged drought which has seen below average rainfall in autumn and winter (Fig 1). Summer rainfall has been well above average.

There are three treatments;

1. Low stock/fertiliser
1 ewe/ha and super at 125 kg/ha every 2nd year - set stocked.

2. High stock/fertiliser-set
2 ewes/ha and fertiliser at 250 kg/ha/year-set stocked.

3.High stock/fertiliser-rotation
2 ewes/ha and fertiliser treatment at 250 kg/ha/year - rotationally grazed (time-based). The rotation is a simple four paddock system with grazing occurring for two weeks, followed by six weeks rest before re-grazing

4. High stock/fertiliser-rotation tactical
2 ewes/ha and fertiliser at 250 kg/ha/year - rotationally grazed (tactical).

This is similar to treatment 3 with the exception that during the period from lambing to marking, the animals graze the whole plot area. This is because it is difficult to undertake rotational grazing when there are lambs at foot.

key research

- ▶ High lamb growth rates and high conception rates can be achieved on native pastures
- ▶ There have been little or no noticeable effects on natural resources

Results to date

Table 1 shows the lamb production in 2009, highlighting that lamb growth rates can be increased well above district averages when good livestock genetics is combined with improved management of native pastures. The Chiltern site uses CentrePlus Merino ewes mated to a terminal sire.

In an separate experiment at Holbrook, the research team is comparing the production and natural resources outcomes when sheep graze across both native and improved (introduced) pastures or are maintained all year round on either native or improved pastures. The "integrated" system appears to be providing production advantages when compared to single pasture systems.

At both sites, the production benefits have been achieved with little or no change in basal cover of native perennial grasses.

However, it can take some time to demonstrate changes in pasture composition and ground cover – two key drivers of changes in NRM outcomes. Further results are required before we can draw firm conclusions.

Conclusions

The important outcome to date is the ability to achieve high lamb growth rates and high conception rates from well managed native pastures when combined with

good livestock management and genetics.



contact

Meredith Mitchell

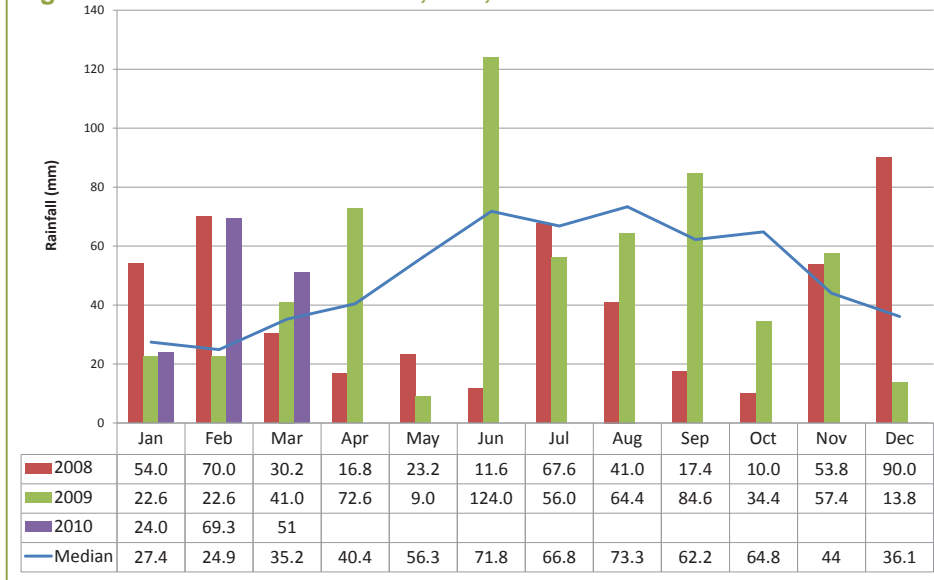
P: 02 6030 4579

meredith.mitchell@dpi.vic.gov.au

Table 1. Chiltern Lamb growth rates 2009

	Average live weight (kg)			Average daily weight gain (g/hd/day)		Lamb marking %
	Birth	Marking	Weaning	Birth to Marking	Birth to Weaning	
EverGraze Chiltern	5.6	15	38	320	287	126
District Average	-	-	19	286	262	95

Figure 1. Rainfall results for 2008,2009, 2010 and the median



Native pastures prove their value

Integrating native pastures into the overall rotation system is helping Chris Mirams, Manager of Woomargama Station and Chair of the EverGraze National Advisory Committee, to utilise pastures.

Chris recently shared his experiences with Gill Fry.

“At Woomargama Station we focus clearly on increasing productivity, health and ultimately the value of the land. The station is a substantial investment in agricultural real estate by the owners and our management ensures the property grows in value over the long term”, Chris said.

“Approximately one third of the property is arable and maintains well fertilised improved perennial pasture species, mainly phalaris. Over half of the property is steep, with relatively infertile shallow soils, which maintains various amounts of native pasture and natural timber. Around ten percent of the property has been planted with interconnecting tree plantations.

In the past, we focussed mostly on the arable area, improving pastures and applying superphosphate at a rate of 130 to 180kg per hectare. Our carrying capacity ranged from 14 to 20 DSE/ha on this country which was set stocked.

Our native pasture areas were also set stocked, mainly with dry stock at 2 to 4 DSE/ha. The pastures were managed poorly with areas under and over grazed, the stock did not “do” well.

I realised that we needed to design a pasture system that grew grass all year round. Our immediate initiative was to sow hundreds of hectares to a wide range of species. Despite moving to a rotational grazing system many years ago, the recent years of low rainfall has highlighted the true survivors; phalaris, lucerne and native grasses.

I now realise that native grasses are one of our greatest resources.

I decided to learn how to manage this resource better so sought advice from Meredith Mitchell (DPI

Producer: Chris and Jacinta Mirams

Location: Woomargama Station, Holbrook, NSW

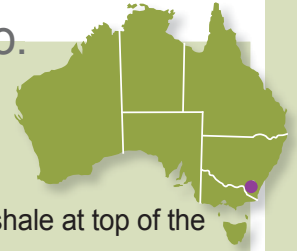
Property size: 2,700ha

Soils: range from alluvial & heavy clay flats to steep shale at top of the valley

Enterprises: 10,000 fine wool Merinos and 1,000 beef cattle

Pastures: phalaris and subs, native grasses and lucerne

farm info.



Rutherglen) and Jim Virgona (CSU Wagga) who are both involved with EverGraze. We identified the main beneficial grasses as wallaby grass (*Austrodanthonia spp*), weeping grass (*Micolaena stipoides*) and red grass (*Bothriochloa macra*). We applied 80 kg/ha of superphosphate and initially rotationally grazed the area with 4,000 wethers.

However, we found the stock did not do as well and wool quality suffered.

We tried all sorts of supplementary licks and blocks but they were expensive & unsatisfactory.

In the end, we came up with a very simple solution. We integrated both improved and native country into the same rotation. We now have three grazing blocks; one for ewes, one for wethers and one for cows.

Each block includes 15 to 20 existing paddocks, some with improved species and others with natives. Managing improved and native pasture species in the same rotational system works really well.

For much of the year it is a continuous rotation. However, in the spring we graze the phalaris particularly heavily to maintain quality pasture, while the natives have a rest. During the summer, when phalaris is in senescence, the summer-active natives earn their keep. Our rotations are very flexible, as we focus very much on what is happening in the paddocks rather than adhering to strict rules.

Despite the continuing years of low rainfall, we are now able to maintain perennial pasture and therefore ground cover and grow enough grass to keep our breeding flock



Chris Mirams

key points

- ▶ Recognise what perennials will realistically grow and persist on your property.
- ▶ Native pastures are a valuable resource in southern NSW hill pastures.
- ▶ Incorporating native pastures into the rotation with phalaris improves pasture management and animal performance.

and herd. Our reliance on supplementary feeding and frequent resowing of pastures has diminished.

The EverGraze mantra of ‘right plant, right place, right purpose’

has proved its worth in our situation”.



Jim Virgona

contact

P: 02 6933 4174

jvirgona@csu.edu.au

Ewe nutritional needs met with native and sown species

In Northern NSW, native perennial pastures alone are highly unlikely to meet the nutritional requirements of spring lambing ewes.

According to the Lifetime Ewe Management, in Northern NSW the recommended fat score at joining is 3.5 and in late pregnancy (day 90 to lambing) it should be maintained at 3 (See Figure 1). With an autumn joining, late pregnancy coincides with late

winter when green herbage is limiting in northern NSW.

On-farm monitoring of fat score for ewes lambing in spring on different pasture types indicated that maintaining ewe fat score at the recommended fat score 3 in the last 50 days of pregnancy was not achieved on native perennial grass-based pastures on either the Northern Tablelands or the North-West Slopes (Figure 2).

key research

- ▶ Native pastures alone may not meet ewe nutritional needs
- ▶ In Northern NSW the recommended fat score at lambing is 3
- ▶ Fat score can be maintained at target levels with a variety of feed sources

In 2009, native perennial grass-based pastures had low green feed availability in autumn resulting in ewe fat score not meeting the recommended level at joining and also failing to meet the recommended target for the remainder of the lambing cycle.

In some years, ewe enterprises based solely on native pastures may come close to meeting recommended fat scores at joining. However, in most years they will fail to achieve minimum fat scores in the critical late pregnancy period unless supplements or other high quality feed sources (sown pastures or forages) are provided.

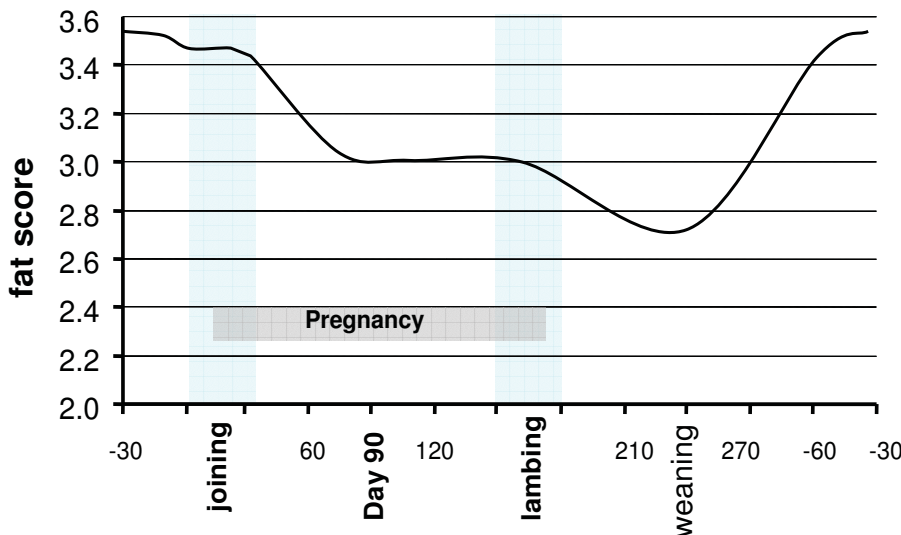
On-farm research has shown that when sown forages, such as lucerne and oats or supplements were available, ewe fat scores were maintained above the recommended levels. Lamb weaning percentages on native pastures alone were 70-80% compared with 90-110% when native pastures were combined with forage oats or lucerne.

With the variable climate that occurs in northern NSW severe limitations to production from ewe enterprises based solely on native pastures could be expected to occur 5 years in every 10 years, with moderate limitations occurring in 70% of years.

With this in mind, farmers need to be aware of the limitations of native pasture for ewe and lamb production and plan accordingly to meet the ewes nutritional needs.

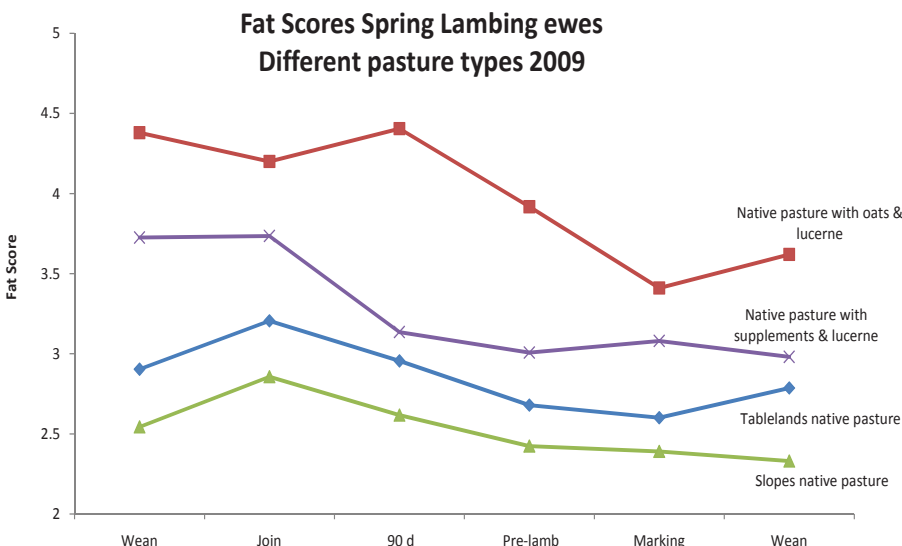
Figure 1. Fat score requirements for spring lambing ewes

Northern NSW Spring Lambing Profile



Source: Lifetime Wool Website: www.lifetimewool.com.au

Figure 2. Ewe fat score on different pasture types



contact

Greg Lodge

P: 02 6763 1176

greg.lodge@industry.nsw.gov.au

Integrating forage sources for success

Growing and integrating a mixture of forage types is the key to a tactical approach John and Laurie Chaffey have taken to managing their property 'Weerona'.

They believe it is essential to grow alternate forage sources for a specific reason, particularly to fill feed gaps or supply quality green feed at key times of nutritional demand for grazing animals.

They spoke with Lachlan Rowling.

"Cropping on some of our old farming country was no longer profitable or sustainable. Over time the soil condition was taking a real hit through declining organic matter, structure and fertility. We needed to address this.

We were losing confidence in the climate and seeing greater variability in rainfall events. We saw a need to build a system that capitalised on variable and unreliable rainfall events. We are also keen to see better natural resource outcomes through ground cover management and improving the use of rainfall and water on the farm.

We are still settling into what is the best system for Weerona but our main goals are to fill seasonal feed gaps and match a range of forage types to the nutritional requirements of the grazing animal.

I think it is important to grow alternate forage types for a specific purpose and not just for the sake of it. We now grow pastures which include native pastures, tropical grasses, lucerne, and forage crops and these are matched to variation in soil types and landscape position across the farm.

We wanted to increase our area of tropical grasses as we thought it a good option on former cropping paddocks and areas that were 'tired'



Weerona.

Photo by Mark Brennan

Producer: John and Laurie Chaffey

Location: 'Weerona', Somerton, north of Tamworth,

Property size: 1,800 ha

Soils: range from light meta-sedimentary loams and shallow sedimentary hills through to heavier and deeper alluvial flats

Enterprises: 1000 Merino ewes, 700 wethers and 150 Hereford cattle

Pastures: Lower input native pastures, tropical grass pastures, lucerne, winter and summer forage crops.

farm info.



or affected by hard setting soils. We sowed a mixture of Premier Digit, Panics (including Bambatsi) and Rhodes Grass. In good years the tropicals produce a huge bulk of feed over a long growing season. It is the average to poor years when they really come into their own producing solid growth after just small rain events. The tropicals also keep some green leaf even in the driest of times and are therefore ready to capitalise on rain. Establishment costs are a one off compared to forage crops.

Some of our better quality native grass paddocks receive inputs. Native pastures remain a key part of the farm and through reduced inputs and good grazing management help to complement other forage types.

There are many benefits for integrating forage sources. They include increased area and density of perennial plants across the farm, better water use and less soil erosion, reducing the autumn feed gap, better understanding the triggers for supplementary feeding & increased stock carrying capacity.

There are some disadvantages. We have less time on our hands due to the demands of a mixture of land-uses. Grazing management can be tricky but not impossible. Especially



John and Laurie Chaffey

key points

- ▶ Grow alternate forage types for a specific purpose, not just for the sake of it.
- ▶ Native pastures remain a vital but mostly lower input aspect of our grazing system
- ▶ Integrating forage sources meets stock nutritional needs

if you are prepared to measure and make an educated decision on the amount of green feed and the corresponding livestock condition. We also use sacrifice (stock containment) paddocks to take pressure off our best paddocks at times, including during drought.

On the whole I think the advantages outweigh the disadvantages. We are looking forward to meeting future challenges, knowing we have a good range of forage types available."



contact

Sean Murphy

P: 02 6763 1100

sean.murphy@industry.nsw.gov.au

Events in your region

EverGraze Field Days		
Friday 20th August	Ararat, VICTORIA Tottenham - Supporting Site Field Day	Rob Shea, P: 03 5352 1357 E: yadin@netconnect.com.au
MLA Making More from Sheep 2010 Forums - 'It's ewe time'		
Tuesday 13th July	Dubbo, NSW at the RSL Club	Topics featured at the forums include: <ul style="list-style-type: none"> - The new ewe - Weaning more lambs - Healthy and contented sheep - Making sheep easier to manage - Turning pasture into product - Profitable finishing systems - Aussie lamb – the world's best - Planning for success. <p>To book a seat at your closest forum call MLA on 1800 675 717.</p> For more information on 'It's ewe time' 2010 Forums go to www.makingmorefromsheep.com.au
Thursday 15th July	Goondiwindi, QLD at the RSL Memorial Club	
Tuesday 27th July	Wagga Wagga, NSW at the Country Comfort Motel	
Thursday 29th July	Carrick, Tasmania at the Ag Fest Function Centre	
Wednesday 18th August	Clare, SA at the Golf Club	
Tuesday 24th August	Hamilton, Victoria at the Showground Function Centre	
Thursday 26th August	Naracoorte, SA at the Town Hall	

What's new?? Farmer Case Studies

There is nothing like looking over the fence to see what other farmers have tried, what has worked well and what hasn't. EverGraze is putting together a series of case studies from farmers trialing EverGraze research on their own farms. The following case studies are available on the website under the information area;

- ▶ **Split Joining put in to practice** - David and Jenny Hewlett - southern NSW
- ▶ **Native pastures prove their value** - Chris and Jacinta Mirams - southern NSW
- ▶ **Changed management of steep gorges** - Scott and Peter Young - southern Victoria
- ▶ **Tagasaste adds flexibility** - Wes Brown - southern NSW
- ▶ **Spanish cocksfoot, leading the way** - Humbertson McKenzie - Tasmania
- ▶ **Kikuyu is king on Kangaroo Island** - Trevor, Lyn, Colin and Keith Bolto - Kangaroo Island, SA
- ▶ **Perennial pasture systems put in practice** - Rod and Bernadette Vearing - south west Victoria
- ▶ **Native grasses an asset for steep hills** – Ian and Susan Maconachie – south west Victoria

Further case studies will be available soon.

There are also case studies from WA on farm financial details of establishing perennials;

- ▶ **Backgrounding lambs on chicory/lucerne pastures at Kojonup** – Thys and Erin Gorter
- ▶ **Tall fescue benefits beef cattle near Manjimup** – David, John and Danielle Mottram
- ▶ **Winter active tall fescue boosts stocking rates and farm profits** – Kelvin and Estelle Ridgeway
- ▶ **Kikuyu provides flexible grazing for sheep south-west of Kojonup** – Daniel and Narelle Simpson

NEW Feed budget and rotation planner

Originally created as a feed budgeting tool, the recently-refined 'EverGraze® Feed budget and rotation planner' helps producers plan their overall pasture rotations with confidence.

The tool allows producers to develop a whole-farm rotation based on individual paddock information. The Excel-base spreadsheet is designed so producers can input data on individual paddocks and animal mobs and the tool will deliver a grazing rotation that maximises animal and pasture production and pasture persistence across the farm. The tool helps producers calculate pasture growth rates, determine how long feed will last and also provides suitable feed rations where feed on offer is limited.

A free version of the tool can be down loaded from Information section of the website www.evergraze.com.au

www.evergraze.com.au

Disclaimer

The information provided in this publication is intended for general use, to assist public knowledge and discussion and to improve the sustainable management of grazing systems in southern Australia. It includes statements based on scientific research. Readers are advised that this information may be incomplete or unsuitable for use in specific situations. Before taking any action or decision based on the information in this publication, readers should seek professional, scientific and technical advice. To the extent permitted by law, the Commonwealth of Australia, Future Farm Industries CRC, Meat and Livestock Australia, and Australian Wool Innovation (including their employees and consultants), the authors, the EverGraze project and its project partners do not assume liability of any kind resulting from any persons use or reliance upon the content of this publication.

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