

future farm

PERSONAL STORIES FROM AUSTRALIAN FARMERS

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Reaching out to nature

Innovative grazing systems show how native pastures prove a better balance

Future Farm one year on

With this edition, *Future Farm* celebrates its first birthday. I'm really pleased to see how the magazine's content and relevance has just got better and better, and its readership has grown. I was also pleased to welcome Landmark as a partner. While *Future Farm* has evolved, and will continue to do so, it has also remained true to its original goal of letting farmers tell their stories about the gains they have made by giving perennial plants a go. These benefits come in many forms and increasingly in light of another patchy start to the season.

Making significant progress in showing how Profitable Perennials™ can make farmers more profitable has been the CRC's flagship research partnership *EverGraze*®. Its Proof and Supporting Sites located throughout the high-rainfall regions of southern Australia have attracted a lot of attention both in the research and on-farm environments. The innovative mixes of perennial pasture cultivars on offer by *EverGraze* are now considered commercially viable alternatives to current practices. The relevance of the research breakthroughs made by *EverGraze*

culminated during May this year when the Commonwealth Minister for Agriculture Hon. Tony Burke visited the Hamilton Proof Site and an adjacent Supporting Site on Mark Wootton and Eve Kantor's *JigSaw Farms* in Victoria.

During the visit, the Minister talked with farmers and researchers before enthusiastically launching our new *Prospects for Perennials* publication. The genuine curiosity in *EverGraze* and FFI CRC shown by the Minister on the day left me convinced that he gained a greater appreciation of the importance of this very good science-farmer collaboration to climate change adaptation.

The results of such collaborations within *EverGraze*, supported by Meat and Livestock Australia, Australian Wool Innovation and FFI CRC, are the primary focus of this edition. One such story centres on the on-farm rewards that have come from a better understanding of grazing management, which has brought back the native pastures on Matt and Melanie's property in New South Wales. By following a prescribed grazing management plan on these pastures, they

now use a lot less fertiliser while maintaining their original productivity.

South Australian farmer, Mark Bucket, is getting better lamb production from increased out-of-season feed though his perennial pasture mix. West Australian farmers, Thys and Erin Gorter, talk about the extra feed they have year-round by mixing lucerne and chicory. We also feature a fascinating story on how NSW farmer, Philip Bush, is using lucerne to manage serrated tussock on his property, now thriving in the drier conditions.

So please read on and enjoy the selection of stories that speak optimistically about farmers successfully using perennials to overcome the many challenges they currently face. Farmers who have taken a punt and followed the *EverGraze* approach of right plant, right place, right purpose are now reaping the rewards.

Kevin Goss
FFI CRC Chief Executive Officer



Read about the successes producers such as Brett and Bernadette Holz (pictured above) are achieving with perennial pastures inside this issue of *Future Farm*.

Future Farm magazine is published bi-annually by the Future Farm Industries CRC Ltd (FFI CRC) ACN 125 594 765.

FFI CRC was established in 2007 under the Commonwealth Government's CRC Program and builds on the research of the CRC for Plant-based Management of Dryland Salinity.

FFI CRC is a unique co-investment between meat, grains and wool industry research corporations, the Landmark agribusiness company, and the combined research power of CSIRO, six State agencies and four universities.

For further information about FFI CRC visit www.futurefarmcrc.com.au

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ISSN (Print) 1835-9906

ISSN (On-line) 1835-9914

Published June, 2008

Design & production: Kondinin Group

OUR COVER

Matt Carter is thrilled with the biodiversity in his native perennial pastures.

• See full story page 4.

Photo: Catriona Nicholls





EverGraze® — right plant, right place, right purpose

Photo: EverGraze

This issue of *Future Farm* showcases success stories from producers involved in the national EverGraze® – More livestock from perennials project.

Advances in farm productivity and environmental enhancement usually proceed in small steps, but this project aims to use perennials to increase profits of livestock enterprises by 50 per cent, while simultaneously improving farm environments through better water management, groundcover, biodiversity and soil health.

To achieve these targets, *EverGraze* looks at the whole-farm system (soils, pastures, animals and management) and how it relates to the catchment. It brings the knowledge and experience of farmers and catchment managers together with Australia's foremost researchers in soil science, agronomy, environmental science, hydrology, animal production and ecology. The project then strategically plans landholder engagement activities to ensure on-farm adoption of more profitable and sustainable grazing systems.

"*EverGraze* looks at the science and the practical application of new grazing systems using more perennial pastures," National *EverGraze* Coordinator, Geoff Saul, said.

key points

- *EverGraze* is developing and testing new farming systems across southern Australia's high-rainfall zones
- On-farm Supporting Sites play a key role in allowing producers to try trial new grazing methods with perennial systems at a commercial scale
- *EverGraze – More livestock from perennials* is a FFI CRC, MLA and AWI research and delivery partnership.

"Catchment groups want to see change on the ground – they want to see these things at a commercial scale and in a real world situation in their catchments."

Proof Sites

EverGraze has established six research (Proof) sites where new farming systems that increase profits and improve the environment are being tested.

Sheep and cattle at Proof Sites across the country are run on a range of native and introduced pastures, such as lucerne, perennial ryegrass, phalaris, tall fescue, chicory and kikuyu.

These pastures are positioned to make best use of the soils and landscapes available. For example, lucerne on well-drained soils and tall fescue on lower-lying areas.

In turn the livestock systems make best use of the perennials through increasing ovulation, lamb survival and growth rates and running more livestock per hectare.

"Our aim is to better match feed availability to livestock requirements and improve the long-term viability of grazing enterprises," Proof Site Leader, Greg Lodge said.

"In our area, we're exploring the relationship between production and biodiversity, whole-farm economics and examining the role of summer-active perennials, such as lucerne, as a mixed pasture."

Supporting Sites

EverGraze also has more than 55 on-farm demonstration sites (Supporting Sites) where producer groups trial new grazing systems in their local environment.

Supporting Sites are managed in collaboration with Catchment Management Authorities (CMAs), state agricultural agencies and consultancy groups.

"Supporting Sites allow groups of producers to trial new pasture systems in their own environment, with their livestock and management," Geoff said.

"This gives them the confidence that the new innovations are robust and viable in their backyard."

"The appeal of *EverGraze* is that it is landholder driven," Namoi CMA soil officer, Simon Turpin said.

"Graziers join producer groups because they share a common problem, with the aim of reducing the factors that restrain production on their farm."

National focus

With Proof and Supporting Sites in five states, *EverGraze* is developing and testing new farming systems across a range of environments, giving the project relevance across the high rainfall zone of Southern Australia. Where similarities occur between environments, major benefits will come from sharing results and experiences.

EverGraze is a Future Farm Industries CRC, Meat and Livestock Australia and Australian Wool Innovation research and delivery partnership. ↘

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Getting back to nature

Driven by a goal of working with nature, not against it, EverGraze® Supporting Site grazier Matt Carter shared his success with native perennial pasture with Catriona Nicholls.

"The property has been in our family for four generations and we've always been graziers and always had perennials," Matt explained.

"That is not to say things haven't changed significantly as the farm has passed from father to son over the generations.

Since taking over the management of my part of the business, we moved from a set stocking system into one of rotational grazing and I believe we are now seeing the return of native grasses that must have been abundant during my grandfather's time.

Traditional grazing management of set stocking held on well up until the 1980s, when it all started falling apart.

We were heading towards dominance of unpalatable perennial grasses, such as wire grass and slender bamboo in conjunction with broadleaf weeds – mainly saffron thistles.

I can remember school holidays in the 90s, where I slashed tracks through the thistles so stock could get to water.

Production was falling apart pretty rapidly.

Instigating change

After attending ag college in the mid 90s my brother Steve, father Chris, and I wanted to make the grass country more productive.

So we decided to sow grazing oats as a clean-up crop and then look at improved pastures, subtropicals and temperates.

But what we found after one year of oats, was that during summer we had all these native perennials such as blue grass, plains and red grass, danthonia (wallaby grass) and silky brown top – and the stock loved them.

key points

- Rotational grazing has seen a return to productive native perennial pastures
- Sufficient rest allows native grasses, herbs and legume to flourish and regenerate
- Management is reducing the need for costly fertiliser and chemical inputs.

farm info.

Case study: Matt and Melanie Carter

Location: Gunnedah, NSW

Property size: 2700 ha

Mean annual rainfall: 610 mm

Soils: Clay and clay loam in the hills

Enterprises: Cattle and Merino and first-cross lambs



Photos: Catriona Nicholls

Matt Carter and son Lachlan surrounded by productive perennial pastures. INSET: Since adopting rotational grazing species native legume species have started to return.

I think the oats actually sweetened the soil, busted the hard pan and the fact that we have given the paddocks a rest has made all the difference.

With these unexpected results, within two years we all agreed we had to change our management towards a strategic rotational grazing system.

The use of native grasses and the change in species wasn't part of the original plan – it came about by accident.

We were supposed to go two years of oats, kill the crop and invest in improved pastures.

Some paddocks went to subtropical and temperate pastures, but in the meantime ones we couldn't get to were returning to productive natives on their own.

Working with nature

It was during the next three years we realised we were spending hundreds and thousands of dollars on trying to grow grasses that didn't really want to be here. So we turned our attention toward nurturing the native species.

And we've found that our production just keeps increasing with our native pastures.

I would say carrying capacity, groundcover and soil health is continually improving at a time when input costs are escalating.

I'm happy to have an extremely low-maintenance, productive pasture system.

We're not putting anything on our pastures, but our production and carrying capacity continues to increase.

At this point I'm happy to do without fertiliser – I've still got so much I can improve with water and wire, which is so much cheaper than annual topdressing.

Key to success is management

These native grasses thrive on our rotational grazing management.

It all boils down to rest – I assess the paddock for feed and how long the mob should stay there.

Our average paddock within our EverGraze trial is 18 ha. It varies between 14-30 ha, but other paddocks are still 150 ha.



Photo: Cathrina Nicholls

Matt's undulating country is ideal for his calving heifers.

"I'd like to keep going until every paddock is less than 20-32 ha (larger on the hard hills).

I'm scoring each paddock against its own merit and the mob stays there for the amount of time the paddock needs – this can vary between four and 30 days depending on paddock size and feed availability.

I aim for 90 days rest to allow a flourish of native legume and herbs to come back into the system.

So little is known about this component of the native pasture that the experts can't yet tell us about the native legumes and the role they play, but they were once thought not to be there.

Australia as a whole is amazingly forgiving and the fact that in 10 years you can take a property from broadleaf weeds and dust to a functioning and productive ecosystem is a testament to this forgiveness.

We are currently carrying 520 cows to calve, 100 steers and 100 cull heifers.

I am still not certain on which way to best take my enterprise, but I'm thinking selling weaners could be an option in the future. But at the moment I'm taking steers through to 400-440 kg.

We basically look for the best market at the time, depending on the season.

Our undulating country is great for heifer calving – last year we had 90 per cent of our cows pregnancy tested and the paddock we subdivided and joined had 99% calving percentage in the Angus cows.

Future developments

I am still doing a paddock a year of direct drilling oats into grass paddocks to finish cattle during winter – the focus is to enhance the native pasture, not kill it.

A University of New England researcher recently found in a given area there was more than 40 species and some of them were winter active.

Biodiversity means better nutrient recycling and the relationship between plants and soil provides a diverse and abundant ecosystem.

Stock can capitalise on this species diversity 365 days a year.

From a family and personal point of view it is much easier to work with nature than to fight it.

We were spending a lot of money and energy fighting against the system nature wanted us to have – it is really rewarding to work with nature and not against it." 🌱

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science behind the story

By Simon Turpin, Namoi CMA

- **The adoption of the appropriate grazing management can improve both the quantity and quality of native pastures, particularly if the pasture has been subjected to over-grazing.**

Matt Carter's current grazing management will allow him to improve his pastures by increasing the desirable native perennial grass and pasture legume species in the system.

For many producers, the more desirable native perennial grasses have been grazed out while the less desirable, poorer quality grasses have come to dominate. Livestock graze the most palatable grasses first and if pastures are managed so stock are kept in a paddock until the less palatable species are grazed down, the desirable species will have been severely over grazed and will eventually die out.

Matt's comment that he is increasing his carrying capacity without applying fertiliser on his pastures would be due to several factors.

Matt can better utilise all of his pasture now his paddocks are a fraction of their original size. And he actively manages his pasture so it is kept at the optimum combination of quantity and quality for as long as possible.

Carrying capacity is likely to increase as more of the better quality native perennial grasses re-establish themselves.

As groundcover increases, evaporation and run-off will decrease, which means more plant production.

Low input native pasture systems are typically less productive than the high input native pasture systems, which have increased stocking rates and fertiliser applications. It is also recognised that

low input native pasture systems usually have greater plant diversity than high input systems. However, for both low and high input native pasture systems it is critical to manage stocking rates accordingly during extended dry periods to reduce the damage to pastures.

- **Simon is a Project Officer with Namoi CMA. He manages three EverGraze Support Sites in the Namoi Catchment. These sites are part of larger grazing projects funded by Namoi CMA aimed at improving the productivity and sustainability of perennial based livestock systems.**

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Perennial pastures prove production worth

Changing to improved perennial pastures and rotational grazing is helping Mark Buckettt, Naracoorte, South Australia, increase lamb production and better use available feed. He recently shared some early results of his *EverGraze*® Supporting Site with Kylie Nicholls.

"I am a member of the South East Prime Livestock Achievers Group and each year members can nominate what they would like to trial on their property. I wanted to look at how increasing the perennial component would allow me to improve the kilograms of lamb produced per hectare," Mark said.

"I also thought that by rotating stock through paddocks more, I could better manage my pasture and ensure I had feed ahead of them.

Currently, we run stock on a slow rotation, about 3-6 weeks in each paddock, but I don't think we rest the pasture sufficiently.

Initial results show we have increased kilogram per hectare of lamb and the perennials, particularly phalaris, are proving their worth.

The *EverGraze* trial started early during 2008 and will run until mid-2010.

Pasture trial innovation

Our pastures are predominantly annuals, such as ryegrass, barley grass and brome grass, with small amounts of phalaris and sub-clover.

I've always been keen to increase the perennial content, it makes sense to look after something that will keep coming back year after year, although annuals certainly still play a part in our system.

When we get out-of-season rain, which seems to be happening more often, the perennials

farm info.

Case study: Mark Buckettt

Location: Naracoorte, South Australia

Property size: 2200 ha

Mean annual rainfall: 550 mm

Soils: Variable, ranging from loam over clay to deep sands and black loam flats

Enterprises: Self-replacing Merino flock, prime lambs, beef cattle



respond and you get a green pick, while annuals just deteriorate even further.

During June 2004, I sowed 22 ha with a mix of perennial species, including a winter-active fescue, phalaris, cocksfoot and sub-clovers.

The paddock had been previously top spread with 100 kg/ha of single super. We sowed about 6 kg/ha of Rolute fescue with higher rates on the flats, 1 kg/ha of cocksfoot on the rises, 1 kg/ha of phalaris and 8 kg/ha of sub-clover. Sub-clover varieties Trikkala and Gosse were sown on the flats and Leura and Seaton Park on the rises.

Since then, we've applied a regular dose of single super at 100 kg/ha before the break-of-season.

In the initial year, I grazed the paddock lightly at a stocking rate of about nine dry sheep equivalents per hectare for short periods, about 7-10 days. Through summer we just took the tips off, I tried to make sure the paddock got an adequate spell to maintain persistence after establishment.

As part of the trial, I split the paddock into six smaller paddocks last year, just under 4 ha each in size, with a central watering point in the middle. I found we weren't grazing the whole 22 ha to its full potential. There were some bare patches where sheep had camped or grazed the pasture right down, while in other areas the grass became tall and rank.

Subdividing it using a three-wire electric fence has worked well and I am getting a more even graze across each paddock.

EverGraze researchers are measuring perennial persistence, soil, and condition, such as groundcover percentage, green pasture percentage, and feed-on-offer and paddock production.



Photos: Kylie Nicholls

A switch to perennials and rotational grazing has seen Mark Buckettt boost lamb production per hectare by 30%.

The main thing we monitor is the perennial plants to make sure none are lost.

Flexible rotation

The trial is being grazed using a shorter rotation of about 3-10 days compared with our slow-rotation system. It is flexible depending on pasture condition and feed availability. During the slower-growing months, such as summer, it may get grazed for up to 7-10 days but during spring the rotation speeds up to about 2-3 days.

I measure feed-on-offer before the sheep go in and after they come out aiming to leave about 1500 kg of dry matter per hectare, which means enough light reaches the plant base keeping the pasture dense and ensuring there isn't bare ground.

key points

- A switch to perennials has better utilised out-of-season rain and feed availability
- Combined with a move to rotational grazing, this system is yielding increased lamb production per hectare
- Flexibility is the key to success – feed availability and pasture condition provide a guide for grazing management.



We started the first year of the trial with 11 DSE/ha, 2 DSE/ha above our average, and aim to increase it to 15 DSE/ha for the second year.

During spring it can be difficult to get on top of the feed, so last year we introduced about 62 cows and calves (equivalent to an extra 40 DSE/ha) for a couple of weeks to better use existing pasture.

Production boost

One of the trial's main aims is to increase the kg/ha of lamb through increased stocking rates. We run about 2500 first-cross ewes, mated to Poll Dorset rams, for a May-June lambing. Most of the lambs are sold at a carcass weight of about 20-22 kg. If they haven't reached this weight at weaning, we shear them during November and finish them on our dryland lucerne, aiming to sell them over the hooks at about 22-24 kg.

The initial results have been successful, with the trial paddock yielding \$94/ha better than the lambs produced under our current system.

The lambs run on other parts of our farm were probably slightly heavier overall, but the increased stocking rate produced more kg/ha.

Perennial performance

Phalaris has proven to be the most successful and persistent species. It is a good buffer,

persistent and it is just a matter of being educated about preventing any toxicity.

The fescue looks magnificent during winter, being winter active, but it doesn't seem to show up as much as the others.

Perennial ryegrass is a no-no, it just doesn't hang around for long enough, while the dryland lucerne works well.

Long-term investment

Although the perennials are expensive to establish, I think you have to spread the cost over the long term – I believe it is a valuable long-term investment.

Running the trial has given me a real feel for how this system would work across the whole farm, there is no better way of learning than actually gaining first-hand experience.

I will consider subdividing our existing paddocks using portable electric fencing, installing some lift-up gates along the fence lines so when ewes lamb, I can lift the fences and let them move themselves gradually into the next paddock.



Photo: Kylie Nicholls

A three-wire electric fence works well to move stock between paddocks with ease.

I was unsure of how the trial rotation would work when the ewes lambled and whether we would still be able to move them, but it has been fine. When lambs are a couple of days old, the ewes move into the fresh paddock by themselves. The three-wire electric fence works well.

The *EverGraze* trial has given me a different way of thinking about things – you can be more flexible and take advantage of the rain that falls throughout the year.”

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By Dr Nick Edwards, SARDI

science behind the story

- Historically, perennials have been used a lot in this region, but during the past 10-20 years their use has probably declined. Farmers have focused less on grazing and more on cropping. But, I think there is a swing back to perennials as farmers are seeing the benefits.

Recent dry springs and the chance of getting rain outside the normal growing season means perennials can kick along dry matter production.

But it is important to follow the *EverGraze* mantra – right plant, right place, right purpose.

Across most farms there is a variety of soil and landscape types, some are suited to phalaris, others to lucerne, tall fescue or other species. There are enough species to deliver one to suit each situation.

Phalaris is a success on Mark's trial site and it has responded well to rotational grazing.

I'm also involved in running a local 1000 ha mixed farming property and, like Mark, think we are better to have the extra production phalaris offers and manage any potential animal health issues, than have no feed with no animal health risks.

Perennials enable you to extend spring and, with rain, you can pick up some summer growth as well.

I think the biggest result for Mark has been increased production through increased stocking rates. Not only has the pasture improved but the more intensive system has lifted pasture utilisation and really boosted profitability.

At the Struan Research Centre in the south east, we have an intensive rotational grazing system running bull beef, moving small mobs every two days. During the past 3-5 years, production has been consistently better than set stocking.

It is just a matter of working out how rotational grazing will fit into your system.

Paddock set-up is important as is ensuring enough grazing lies ahead of the livestock. Also plan how many and what class of animals to run. For example, if you plan to finish lambs during summer on lucerne, ensure enough paddocks to allow a 4-6 week rest between grazings and enough lucerne in total to 'finish' them (say 12 weeks worth).

Rotational grazing does not have to mean spending a lot of money establishing new fences and infrastructure, such as watering points, but a plan will help maximize the benefits of intensifying your grazing.

- Dr Edwards is a *Grazing Production Systems Senior Research Scientist with SARDI and a farmer in his own right.*

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Perennial pastures – more than just a pretty face

For South Australian graziers, Jeff, Anne and Cameron England, perennial pastures deliver more than just a green landscape in the midst of a dry summer. The England's combination of lucerne, chicory, phalaris and cocksfoot provides year-round stock feed and has empowered the family to take marketing decisions back into their own hands. Laureta Wallace spoke with Cameron to find out more.

"Our roadside lucerne paddocks get quite a lot of attention during summer when everything else is brown," Cameron said.

"But for us, lucerne, combined with our other perennial pastures, doesn't just look good, we have been really impressed with the benefits, such as year-round pasture and more control over selling decisions.

We first sowed perennial pastures after witnessing the success other family members had with them.

We planted one paddock during August 2005, and, we were so impressed we sowed about another half a dozen paddocks.

Our involvement with the *EverGraze*® project includes being one of numerous on-farm Supporting Sites sites demonstrating perennial pasture grazing systems. There are three paddocks involved in our trial – one which was planted with lucerne, chicory, phalaris and cocksfoot during 2005, another planted with the same combination during 2007 and a control paddock with dryland annual pasture species.

There is barely any difference between the 2005 and 2007 perennial pasture paddocks – the species have persisted really well. Except for the chicory, there is hardly any left in the 2005 paddock.

key points

- A combination of perennial species has provided year-round feed and greater livestock marketing options
- *EverGraze* has allowed for better economic analysis of production results
- Cattle provide a gentler grazing option than sheep for newly established perennial pastures.

farm info.

Case study: Jeff, Anne and Cameron England

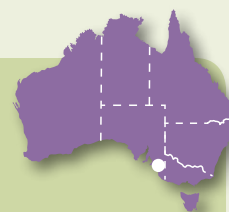
Location: Keilira, Kingston, South Australia

Property size: 1620 ha (about 200 ha sown to perennial pastures)

Mean annual rainfall: 600 mm

Soils: Sandy hills and clay flats over limestone

Enterprises: Fine wool Merinos, prime lambs and cattle trading



We planted a significant amount of chicory in the original paddock but decided to reduce the amount we planted during 2007. We found that chicory tended to hinder the establishment of the other pastures and it doesn't persist as well as other species do. Why this is I don't know. There are a few types of chicory, such as Puna that persist longer. Grouse and Choice seem to be fantastic for 2-3 years but then fade dramatically.

The same was the case with perennial ryegrass – it completely dominated and then died as soon as things got tough.

Plantain was similar. But the lucerne, phalaris and cocksfoot are persisting well four and a bit years on.

Data collection

Since 2007, I have recorded what stock have grazed the perennial paddocks and their weights.

Probably the main reason we got involved in *EverGraze* was to determine the economic benefits we were deriving from planting perennials. Tim Prance from *EverGraze* has analysed our records to compare the difference in productivity between our existing annual and our new perennial pastures. The two perennial paddocks monitored (including a newly sown paddock) carried 13.4 dry sheep equivalent per hectare (DSE/ha) for a 15-month period compared with 12 DSE/ha for the annual pasture. However, during each of the past two summers the perennials have produced more than \$200/ha of liveweight gain from late winter-dropped cross-bred lambs, Merino lambs and weaner steers.



Photo: Anne England

Cameron England in one of his family's perennial pasture paddocks which was sown during spring 2004. After more than five years the lucerne is still persisting well.

Grazing patterns

We tend to use the perennial paddocks for providing green feed when other ones are out of production – say from January to about May. During this time the dry feed is diminishing but the perennials can still provide feed. For example, now (late May), the perennials are booming after some recent rain and warm temperatures – they really extend the growing season.

We run steers and heifers and cross-bred lambs on these pastures. These are the stock that need to gain weight.

Stock are generally not grazed on the perennials for any longer than a month at a time, but it depends on the time of the year. For example, during spring the pasture grows faster than the stock can eat it but during



February and March we rotate stock regularly so pasture is not damaged.

The stock also need fresh pasture to continue gaining weight.

Putting on weight

We have definitely found this new system has enabled us to put kilograms on our store stock at times of the year when weights would have been slipping under our previous system.

We used to sell during December and January because the stock had put on as much weight as our pasture would allow them to. Now when we get to that time we usually decide to sell and keep a few. We have the ability to manipulate the market. Animals continue to put on weight, usually up until February, and afterwards they can still maintain their weight.

At the break-of-season market prices tend to increase as people have either sold everything or are forced to sell. By keeping some stock until this time, we can usually get a pretty good return.

A few mixed years

Since planting the perennials I'd say the seasons have been poor to average.

We have had some very poor springs plus late starts and early finishes. One year it didn't rain until June 10.

However, there have been some decent summer rainfalls, which have really highlighted the benefits of these pastures.

We will definitely plant more perennials whether we do this year or down the track, we just don't know. Perennials are expensive to establish, with a long payback period. We may be able to carry even more stock on them, but we don't want to risk losing the pasture. We may drop stocking rates back a bit. It will take us at least 10 years to fully evaluate perennials, but there will always be a place for annuals just to carry stock.

We added three more perennial paddocks during 2007 and two more during 2008. This year we are toying with the idea of cutting a paddock for hay or planting a specialist hay crop, for example barley, for better weed control.

When establishing perennials weeds have been a bit of a problem, hindering the pasture output during the first year. By planting a hay crop we hope to reduce weed seed-set in the lead up to turning the



Photo: Cameron England

The England family use their perennial pastures to fatten steers and prime lambs. INSET: A perennial pasture combination sown during August 2005.

paddock over to perennials. In the past we have just sprayed during August and direct drilled when the annuals have all died.

In the establishment year grazing is kept to a minimum and is carried out usually during March and April. We mostly use cattle for this first grazing, as they are not as harsh on the pastures as sheep." 🌱

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By Tim Prance, Rural Solutions SA

- **The implementation of drains and the subsequent planting of perennial pastures have given Jeff and Cameron England's property a new lease of life.**

The property is reasonably isolated and not well serviced by traditional extension services. However farmer groups such as the Keilira Farm Management Group help to fill the gap. The area is typified by undulating sand dunes with shallow heavy clay flats overlying limestone. Poor drainage and a lack of outfalls to the sea mean the flats are prone to winter waterlogging and salinity.

Tall wheatgrass has been the only perennial grass to persist on these flats, but it is difficult to manage, has a short growing season and provides poor-quality feed for livestock. Phalaris has been sown on areas further south where soils are deeper.

While the lower part of south-eastern SA has been drained for many years,

the northern part has only been drained recently and as such, farmers have started planting perennials.

The area can probably carry as many animals on annual pastures as it can on perennials, but perennials provide out-of-season feed for livestock. Stock can then continue to gain weight during winter and be saleable during July/August. The stocking capacity of the Cameron's lucerne-based pastures has been greatly increased because the lucerne is not winter cleaned. Lucerne persists over summer, because it can get its roots through the fractured rock and into the water table, which rarely falls below two metres even after a series of dry years. Lucerne is also tolerant of the saline groundwater. Local landholders hope the drains will remove the surface water during a normal wet winter.

Perennials also provide groundcover to minimise evaporation from the soil surface, help to maintain a lower water table on the interdunal flats, improve soil structure and help reduce livestock pugging during winter.

Summer-active perennials, lucerne, chicory and cocksfoot, are the most popular species grown to date but farmers are trying other perennials such as tall fescue.

To make the most of perennials, farmers need some knowledge of pasture assessment, grazing management and run a livestock system producing late dropped weaner animals. I have analysed Jeff and Cameron's stocking records plus their feed-on-offer and feed quality estimates, then used GrazFeed to estimate livestock intakes and liveweight gains. This has provided a comparison of dry stock equivalent rates and meat production on perennial as opposed to annual pastures.

- **Tim Prance is a senior consultant in pastures and grazing systems with Rural Solutions SA.**

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Subtropical pasture establishment – worth the wait

Brett and Bernadette Holz are making their first foray into subtropical perennial pastures with an *EverGraze*® Supporting Site and they recently shared their establishment experiences with Catriona Nicholls.

“Working with dryland pasture systems has been a steep learning curve for us, coming into the area from the Hunter Valley,” Brett explained.

“I grew up on a dairy farm, which relied heavily on irrigated pasture and without the water it wouldn’t work.

Learning to manage dryland pastures and how to get the best out of what is there is a real challenge.

Initially we’ve been cropping for the purpose of cleaning up the country, with the long-term goal of establishing permanent pastures for our cattle.

All the country is clean and ready now, but we need to take a step-by-step process to produce some winter feed.

We are running 280 breeders, 165 weaners and dry cattle, and 140 steers on a leased paddock. These steers are aimed at the feedlot market.

When we first got here, there was a ryegrass mix, which was totally impractical – great for about two weeks during spring, then a big storm would come and it would all fall over.

We’ve sprayed out the paddocks, cropped with oats and forage sorghum and slowly moved into perennials.

At this stage we have lucerne as pure stands for hay and are now venturing into summer-active subtropical grasses and tall fescue for grazing.”

farm info.

Case study: Brett and Bernadette Holz

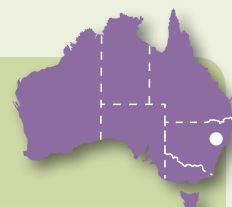
Location: Quirindi, New South Wales

Property size: 1130 ha (300 ha leased)

Mean annual rainfall: 750 mm

Soils: Black basalt ranging to chocolate loam

Enterprises: Cattle



Establishment of their new subtropical perennial pastures seems to have been a success for Brett and Bernadette Holz so far. INSET: The perennial mix includes Katambora Rhodes grass to help prevent erosion.

key points

- Subtropical grasses will provide summer feed to complement lucerne pastures
- Establishment requires patience, rainfall and careful grazing management
- Perennial pastures are a long-term investment.

Promoting perennials

“During late November 2008, I attended a Landscan course run through the New South Wales Department of Primary Industries (NSW DPI) in the Willow Tree area,” Bernadette said.

“They were promoting perennial pastures and looking for trial plots; so we got involved.

It was quite coincidental and good timing, the paddock at the top of our property was so well cleaned it had eroded. During Summer 2007-08 heavy rain caused wash and we were looking at planting lucerne. But because of the erosion, we thought we could try the subtropicals to hold the soil together.

Currently we have a six-hectare trial block and a 25 ha *EverGraze* Supporting Site with additional subtropicals pastures funded by Namoi CMA – the rest is fallow.

One of the fallow paddocks will go into tall fescue and the balance is sown to oats and wheat for winter grazing.

All going well this country will later go down to tall fescue and subtropicals.”

Lightly lightly

“This is our first experience with subtropicals and we were quite nervous. They have tiny seeds, and establishment is well known to be the hardest part of the process,” Brett said.

“But, the timing and amount of rainfall we received since they went in is unbelievable.

Everyone tells you the same story – watching it establish is so painful, but because we’ve been warned you accept that you need to be patient with these pastures.



Our agronomist said we had to put it in and not look at it. We sowed it with an agrodrill during November and we had good follow-up rain, so that has helped.

The ability of the pasture to thicken has been particularly impressive. When you walk in there you can still see patches of bare ground, but we're expecting that to be a different story by next year.

I think a key to our success so far has been the cleanliness of our paddock and we were fortunate with rain. The timing of the NSW DPI course and the introduction was very timely with the paddock.

We've added a tall fescue component to the subtropicals to provide winter feed, so this should be our last year of putting in oats and wheat.

Next year we'll have a good start with the subtropicals during summer and the fescues during winter.

Our chosen species include Bambatsi and Gatton panics (45 per cent each), Katambora Rhodes grass (10%) and floren bluegrass and Bambatsi in the second paddock.

Katambora Rhodes grass should help with erosion due to its prostrate growth habit.



Photo: Catriona Nicholas

The small seed of subtropicals makes establishment a challenging and expensive process, but Brett aims to have a productive perennial pasture for many years to come.

All in all, both paddocks seem to have established successfully.

Sowing the seeds of success

There are two different seed principles to choose from when sowing – coated or uncoated seed.

NSW DPI wanted to use uncoated seed in the trial block and it was blended with fertiliser at sowing to help flow.

When we went to buy seed for the top block there were many opinions. But the general

consensus was the coated seed is the safer, albeit more expensive.

And if establishment is so important then to us it seemed worth the effort.

At the time we looked at annual systems and the cost of chemical, fertiliser, seed and diesel on an annual basis – when we did the comparison, the cost was justified.

The thing we found ironic was that nobody seems to question purchasing oats seed at \$1000 plus and fertiliser annually and when you sit down and look at doing that anyway, compared with a one-off expense, it really made sense.

The advice is to graze them lightly for the first 12 months and let

them go to seed.

That is where we are at now – the grasses have gone to seed and we about to graze with weaners.” 🌱

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science behind the story

By Lachlan Rowling, NSW DPI

- Recently, many 'tired' paddocks on the slopes of Northern NSW have been returned to permanent or phase pastures based on tropical grasses. However, Brett and Bernadette Holz have opted for tropicals based on their potential for impressive warm-season production and their capacity to contribute to landscape management through soil stabilisation, high groundcover, and litter and organic matter inputs that drive the soil biota interaction.

Achieving successful tropical pasture establishment can be a major hurdle. The Holz's made an opportunistic decision to sow during favourable warm-season rainfall into a paddock free of summer weeds.

The tropicals have been sown on a sloping landscape dominated by a basalt-derived cracking clay (Vertosol) soil. Bernadette pointed out that Vertosols tend to erode when bare, representing a management challenge.

The natural slaking process of cracking clays means that masses of soil can be stripped from paddocks in a single intense summer rainfall event. With sheet and rill erosion, you only need to lose the equivalent of one millimetre of soil to wash about 10-14 tonnes of soil from one hectare.

Tropical grasses were selected in preference to a lucerne monoculture for their potentially higher groundcover and longer growing season. Well-managed tropical pastures intercept rain and reduce surface run-off. Deep, fibrous root systems also anchor and stabilise the vertisol soils.

The Holz's chose a seed mix to suit the heavy soil landscape and for the potential of species including Bambatsi panic to boost overall pasture quality. Rhodes grass was included for its ability to spread laterally via runners or stolons.

The sowing rate for Rhodes was reduced to 10 per cent of the species mix to limit

its dominance – it can be a stronger, more competitive seedling.

The Holz's have made a great start to the successful establishment of their grasses. The next step in managing these pastures will be to establish a legume component and choose an appropriate grazing management strategy. This process will be assisted through funding and project coordination from the Namoi CMA and inputs from NSW DPI.

- *Lochie is an advisory officer with NSW DPI and contributes to the EverGraze project through extension work in Northern NSW.*

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Pairing perennials proves profitable

Western Australian couple, Thys and Erin Gorter, have discovered the wonders of finishing prime lambs on perennial pastures. Thanks to their *EverGraze*® Supporting Site, the pair established a mix of lucerne and chicory and are now enjoying the savings reaped from reduced supplementary feed costs.

"We had read about chicory and saw it as an alternative to the feedlot and high pellet costs, to finishing or backgrounding our prime lambs," Thys said.

"Having successfully used lucerne on other parts of the farm we chose to add it to the mix as risk management strategy in case the chicory didn't work. Parts of the paddock were also more suited to lucerne, being high and gravelly.

We chose SARDI 10 lucerne for its winter production, Puna was the only longer-term chicory seed we could get! Other varieties were not an option, as we wanted this pasture to last at least five years.

We included lucerne to also act as a source of nitrogen for the chicory.

Starting out

We sowed a 32-hectare *EverGraze* Supporting Site mid-September 2006 after spray topping during spring 2005. We top-dressed during January, 2006 (3:2 phosphorus/potash).

Weed control is critical when establishing a mixed-species perennial pasture. We targeted broadleaf weeds before sowing otherwise options would later be restricted.

It also is important to have a paddock system that supports sound grazing management and prevents overgrazing. We constructed fences and troughs post-sowing however, it would be ideal beforehand.

key points

- Combining lucerne and chicory can provide an alternative to finishing prime lambs
- Site preparation and infrastructure set-up is crucial to the successful establishment of perennial pastures
- Aim to allow pastures to recover sufficiently after grazing.

farm info.

Case study: Thys and Erin Gorter

Location: Mobrup, Western Australia

Property size: 920 ha

Mean annual rainfall: 300 mm

Soils: Gravel loam and sand over clay (on trial site)

Enterprises: Grains, wool

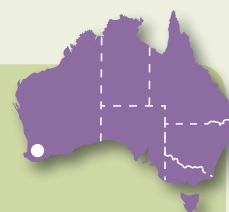


Photo: EverGraze

Interest in Thys and Erin's pastures was evident with a good roll up at an *EverGraze* field day during October 2008. *INSET:* Chicory recruits.

Establishment

A contractor sowed the chicory and lucerne in alternate rows at 10 millimetre depth, or as shallow as the disc machine would allow. Discs minimised soil disturbance and press wheels helped germination rates.

The alternate rows seemed a logical way to ensure an even spread of the species across the paddock. It was also a better way of controlling the sowing rates.

During October 2006 we applied 50 kilograms per hectare of mono-ammonium phosphate (MAP).

We experienced a major locust infestation that was untreated. The locust damage to lucerne was extensive, although it recovered, but they didn't affect the chicory at all!

During spring 2007, we sprayed for high levels of red-legged earth mites, which damaged both the chicory and lucerne.

Broadleaf weed management (erodium and capeweed) proved a problem after

establishment. We chose not to spray during the first autumn, which was a mistake. The weeds, especially the capeweed, set the lucerne back as it didn't tolerate the competition. Worse still, after the capeweed got too large there were few or no chemical options. Grazing helped but it was a case of waiting until the following autumn to spray.

Pest and weed control in this mix was challenging because we relied on contractors. This can compromise the timing of (some) sprays. Plus the mix of plant species reduced the amount of spray options. This placed a heavy emphasis on paddock preparation.

Grazing management

Since establishing the pasture we have grazed large mobs of sheep for short periods, allowing plants to recover between grazes.

While the stocking rates so far do not break any records, it is the out-of-season feed and flexibility as a back grounding system that really makes these species valuable to us.



When grazing a mixed stand grazing needs to be tightly controlled. The 32 ha site was grazed as a whole during the beginning, which meant there were too few stock on it to obtain an even graze. The lucerne was selectively grazed and it took a longer time for the stock to get a taste for the chicory. Smaller grazing areas and higher stock numbers were needed to prevent grazing selectivity. By splitting the paddock up into quarters and rotating the same number of stock the feed was used more efficiently and allowed each section to be rested. A trough was placed in each section to ensure adequate water availability.

Seedling recruitment

It is a wise idea to let chicory go to seed during the first 18 months. This will allow for seedling recruitment and result in an increased pasture density during future years.

Nutritional management

We fertilise the paddock annually with 100-150 kg/ha (super-potash). We will need to re-apply the lime as we believe lime levels decline over time and higher levels help lucerne persist.

It is important to maintain a base level of phosphorus and potassium. The pH must remain above 5.2 as lucerne persistence

(and general performance) is significantly affected by aluminium levels in the soil. Aluminium is highly active at a pH below 5.2. Before sowing lucerne the pH at depth (10-20 cm) needs to be checked as this can also have a significant effect on performance.

Establishment year review

Our mixed perennial pasture system has seen us view summer rain as a positive rather than a negative.

Grazing management is the key to maintaining the longer-term persistence of a mixed perennial pasture stand. Some sections of the site are showing signs that one species may outlast the other. Weed issues plagued us during the first year. Their impact is not to be underestimated!

The lucerne/chicory combination was used to finish and background our lambs. The lambs recorded sound growth rates reaching target weights about 2-3 weeks earlier than we had planned. This meant they were on grain for a fortnight less.

Looking forward

There is also the possibility of using the combination for Vitamin E supplementation prior to the feedlot. Research has suggested that grazing ewes on chicory for 10 days prior to mating can increase ovulation, however

there are still questions to be answered on this topic. Even with small areas sown to the perennial pasture mix the system provides us with the ability to provide Vitamin E to young stock without having to inject them. This alone is a real advantage in our farming operation during summer.

We may need to add more clover to the paddock to increase the legume content. Serradella may be more suited to the lower sandy country. This is something to consider in the establishment year of paddocks with low subclover seed banks. While the clover is not necessarily required for nitrogen fixation (lucerne can do this), it does provide excellent winter and spring feed. Annual grasses still provide great benefit during winter and spring.

The cost benefits

The cost benefits of finishing lambs to target weights in the chicory/lucerne paddock and a reduced time on pellets in the feedlot far outweigh the costs of establishing the perennial pasture.” 🌱

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By Paul Omodei, AgVino

science behind the story

- **The success Erin and Thys Gorter are having with their lucerne and chicory combination is thanks to the couple's strong focus on grazing management.**

Erin and Thys split a large paddock into four small paddocks allowing them to run large numbers of stock for short periods of time.

Importantly, they made sure they had the necessary fence and water infrastructure in place before they started – because you cannot cell graze unless each paddock has water!

The decision was made to sow lucerne basically because a legume was needed to feed the chicory. During spring and summer, the lucerne takes over from the clover in supplying nitrogen to the non-nitrogen producing chicory and other grass species such as ryegrass and barley.

The combination of lucerne and chicory is not ideal – it is a bit tricky but it is

highly palatable to livestock and highly productive for the bottom line.

Perennials have traditionally not been popular in south-west Western Australia because set stocking on annual pastures is usual practice.

If cell grazed lucerne and chicory are great sources of feed during shoulder periods – early Autumn and summer – when annual pastures are not available.

Perennials are able to capitalise on early rainfall, say 30 mm, when it occurs before the main break. Whereas annuals will still need to germinate and get out of the ground.

During spring perennials will still be hanging on when the annuals have set seed and died. They go into a lull during winter but that's ok because that's when the annuals are performing.

Lucerne and chicory will persist during summer and provide green feed when everything else is brown. This green

feed is a great source of Vitamin E, especially for young animals.

This season has been a perfect example. The Gorter's perennial paddocks have been green since spring, allowing them to run ewes and weaners. The stock have dosed up on Vitamin E without the need to yard them. Young stock, for example, need only graze lucerne for two days to receive their monthly Vitamin E quota.

The secret to making the most of perennial pastures is treating them with caution during winter and summer but grazing them hard during spring.

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Perennials are set to tussle with the tussock

A changing climate has seen serrated tussock become a significant challenge for farm manager, Philip Bush, Goulburn NSW. Perennial pasture establishment could hold the key. Philip shared his tussock management strategy with Catriona Nicholls.

“Drier winters and out-of-season summer rainfall, combined with several years of drought have seen serrated tussock thrive on *Chatsbury*,” Philip said.

“We’ve looked to improved perennial pastures to find a solution.

I recently looked at our historical rainfall records and the average annual rainfall since 1890 is about 860 millimetres. But for the past seven to eight years we’ve struggled to reach 600 mm.

Traditionally we would get wet winters and the tussock doesn’t like wet feet, so it didn’t become a significant problem. But I think the combination of recent dry winters and summer rainfall, with some possible overgrazing due to drought, has allowed tussock to get away.

Competitive approach

Much of the country here is steep and unarable and has been under native pastures – predominantly microlena. The challenge was to remove the tussock and replace it with something more competitive under a changing climate.

The native pastures have been terrific for grazing, but although I didn’t want to lose them I had no alternative – the only way to get rid of the tussock was to spray it out.

Our approach has been to spray out the tussock and unfortunately this chemical control option is severe on the native pastures.

key points

- A change in rainfall pattern has seen serrated tussock thrive and out-compete existing native pastures
- Establishing perennials could bring an end to the problem
- A perennial combination is set to provide year-round feed in a changing climate.

farm info.

Case study: Philip Bush

Location: Goulburn, New South Wales

Property size: 4000 ha

Mean annual rainfall: 860 mm

Soils: Basalt and granite

Enterprises: Sheep, cattle and cropping for stock feed



Photo: Julian Minehan, Landmark

Philip uses a rock hopper disc seeder to establish perennial pastures after spraying in Chatsbury’s rockier tussock-filled paddocks.

We sprayed with Taskforce using a helicopter during late winter-spring and left the paddocks during summer, for the tussock to die out.

During the past we have had trouble sowing the hill country down with a tyned implement – it had difficulty handling the stony country.

After a trip to Henty field days we invested in a rock hopper, which is a disc machine that can roll over the rocks.

We follow up the initial winter-spring spray during mid-to-late autumn with roundup and then direct drill the pastures using the rock hopper.

I’ve chosen a mix of phalaris, cocksfoot, subclover and white clovers, which complement our lucerne country to provide year-round feed.

Depending on rainfall, I hope to graze the newly-established perennial pastures during spring. Last year we didn’t get rain until Christmas, so this initial grazing was delayed.

We are working our way through a pasture-improvement program and currently the property is about one-third improved pastures and two-thirds native pastures.

Lucerne for lambs

We currently have 70 hectares of lucerne pastures to complement the more winter-active perennial species.



Photos: Julian Minehan, Landmark

Before sowing a competitive pasture mix Philip sprays out the tussock with Fluproponate (Taskforce) INSET: Lucerne provides a valuable pasture option for finishing lambs during summer.

There has always been a small amount of lucerne on the place, but we've increased this recently to allow us to finish our lambs.

Increasingly dry winters and the odd fall of rain during summer has meant we haven't had rain at the right time for our traditional pastures.

Rain during late spring often just leads to the grasses, such as phalaris, running to head, whereas rain during the warmer months sees lucerne respond rapidly.

We sow the lucerne during spring and hope to be able to graze it for the first time around Christmas.

Our cross-bred lambs hit the ground during June-July so we wean during spring.

We tend to wean the lambs onto the grass-based pastures to let them settle and then move them onto the lucerne during November to finish.

The lamb market has changed and now demands heavier lambs more quickly.

Lucerne allows us to turn off lambs quickly at about 48 kilograms liveweight (21 kg dressed).

We haven't had any problems grazing any of our pastures and lambs don't scour on the pastures compared with the cereal crops.

I think the challenges occur with grazing species such as lucerne and phalaris when there is a flush of growth – not something that has been a big issue these past few seasons.

We rotationally graze our stock, although stock movement depends on pasture availability.

Many of the paddocks are large (up to 200 ha) and we are working through a subdivision program to allow us to better manage our pastures and livestock.

I'm keen to bring paddocks back to an average size of about 40 ha.

At this stage, I think perennials will help us beat the tussock problem, it seems to be working so far, but it is still a work in progress." 🌱

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Supported by



science behind the story

By Julian Minehan, Landmark

- **Serrated tussock is now a major problem facing farmers in the Southern Tablelands of NSW. It's prolific growth, unpalatability to stock and ability to produce massive amounts of seed (one mature plant = 100,000 seeds per year) under harsh conditions, makes control extremely difficult.**

The approach Philip Bush has taken on *Chatsbury* uses an integrated control options. Phil sprays out the tussock with Fluproponate (a selective herbicide) and is sowing competitive perennial pastures when moisture is available.

Successful tussock control requires the establishment of such pastures and follow up chemical control of new seedlings.

The perennial combination Philip is using includes a mix of phalaris, cocksfoot and clovers.

This combination will provide winter, spring and summer feed. The selected pasture species also can handle adverse conditions and out compete the tussock.

The addition of lucerne to Philip's grazing system has provided a valuable protein source during summer to finish lambs and also provides the option of cutting hay to feed out during the colder months.

Philip's lucerne is certainly the talking point of the district. The focus on timely weed control and replacing nutrients removed through grazing and hay production has encouraged persistent and healthy stands of winter-dormant lucerne. One particular stand is seven years old and still has high plant numbers (40-50 plants per square metre). This impressive stand can carry 13 sheep equivalents per hectare during summer producing lambs with an average weight gain of 250 grams per head per day.

The past 10 years have been extremely difficult in this region, with the lack of rain and the rising costs of production. However, Philip remains positive and believes an integrated approach to tussock control is working. His progressive and successful approach is encouraging for neighbouring producers.


- **Julian Minehan is a Landmark agronomist based in the Southern Tablelands region of New South Wales.**

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future farm


PERSONAL STORIES FROM AUSTRALIAN FARMERS

 "From a family and personal point of view it is much easier to work with nature, than to fight against it."

Matt Carter, farmer, New South Wales (see story, page 4)

 "Running the trial has given me a real feel for how this system would work across the whole farm, there is no better way of learning than actually gaining first-hand experience."

Mark Buckett, farmer, South Australia (see story, page 6)

 "The cost benefits of finishing lambs on a chicory and lucerne combination outweigh the costs of establishing perennial pasture."

Thys Gorter, farmer, Western Australia (see story, page 12)

Future Farm brings you success stories from people adopting farming systems based on perennial plants that are making their farms, local landscapes and catchments more profitable and sustainable. Dryland salinity, climatic variability and other natural resource constraints threaten the long-term viability of regional areas. However, backed by innovation and good science, farmers are successfully managing these constraints and often turning them to their advantage.

FFI CRC was formed in July 2007 to build on the former Cooperative Research Centre for Plant-based Management of Dryland Salinity's work in making dryland agriculture in southern Australia more adaptable through innovative research, education and training, and commercialisation. The CRC promotes innovation in dryland farming appropriate to Australia's unique environment, and which will prosper in the long term.

For further information about FFI CRC visit www.futurefarmcrc.com.au

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