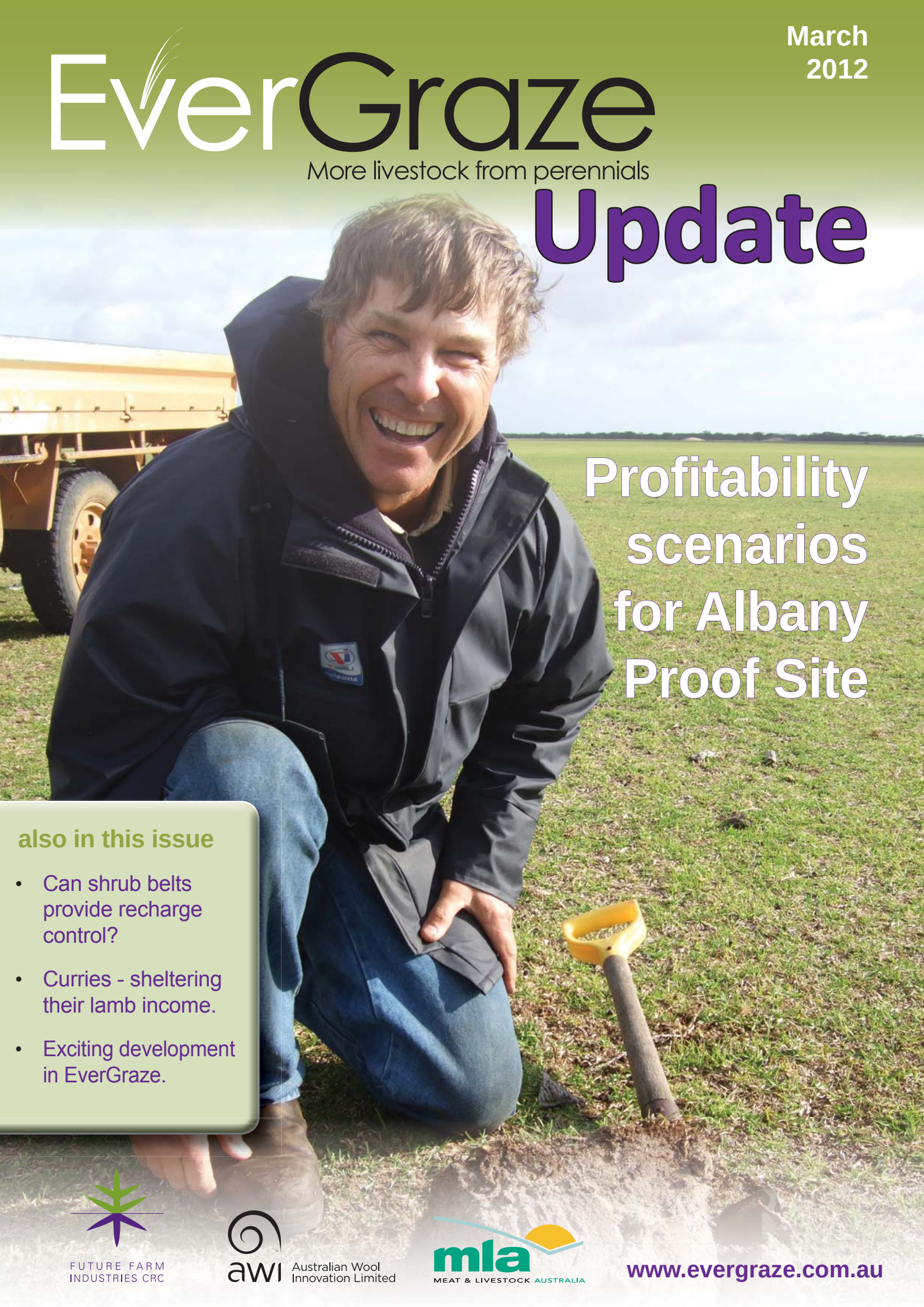
EverGraze

More livestock from perennials

March 2012

Update



Profitability scenarios for Albany Proof Site

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- Can shrub belts provide recharge control?
- Curries - sheltering their lamb income.
- Exciting development in EverGraze.

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Profitability scenarios for Albany Proof Site

An EverGraze Proof Site can only test a limited number of management options within a livestock system over a few years.

A computer simulation however enables researchers to explore many more options and seasons in the search for the most profitable and sustainable outcomes.

Last year EverGraze researchers at Hamilton, Wagga and Albany utilised a livestock and pasture model called GrassGro to expand the Proof Site results. This article will focus on findings at Albany.

Key points

► Introducing perennials into a prime lamb production system based entirely on annual pastures increases profit and reduces groundwater recharge.

► Gross margins for perennial based systems are less affected by dry autumns and springs.

► Increasing weaning percentage through improved management of ewe condition and lambing can substantially lift profit, particularly for producers currently weaning at the WA state average of around 80%.

The Albany site (in Wellstead, WA) tested the hypothesis that the adoption of summer-active perennials and high-performance meat genetics would substantially increase profit while reducing ground water recharge. To test this hypothesis a field demonstration was undertaken comprising of kikuyu, lucerne, tall fescue (summer-active), chicory and setaria/panic running Merinotech ewes joined in February to Poll Dorset rams.

The data generated was used to calibrate a model which evaluated the impact of perennials over a greater range of seasons, in different livestock enterprises and with alternative management. The various scenarios and findings are reported in tables 1 and 2.

The modelling results support the hypothesis that introducing perennials into a system based entirely on annual pastures increases profit and reduces groundwater recharge (results not presented). Increases in profit were primarily due to a decrease in supplementary feed. Gross margins for the perennial based systems were also less affected by dry autumns and springs. This is particularly important as climate modelling predicts the site is likely to be drier in the future.

The simulations indicate that for a Merino x terminal sire enterprise at Wellstead, based on 25% perennials it is most profitable to run 6.5 ewes/ha, lambing in July with livestock condition and lambing practices managed to achieve 120% weaning. Increasing perennial content to 50% might result in further modest increases in gross margin however the main benefit appears to be increased drought-proofing of the feed base and further reductions in drainage below the root zone.

While summer-active tall fescue was included in the 50% perennial system, field experiments indicated that it is not persistent in Wellstead as it did not survive long droughts. It is recommended that producers adopt the proven and persistent perennials - kikuyu and lucerne.

The analysis did highlight that increasing weaning percentage through improved management of ewe condition and lambing can substantially lift profit, particularly for producers currently weaning at the state average of around 80%.

Beef cattle enterprises are uncommon in the study region, a fact that is supported by this analysis which suggests cattle are for the most part unprofitable.

All of the sheep enterprises simulated were economically viable. It is possible that a split joining system could lift profit further by mating a percentage of Merino ewes to terminal sires and the remainder to Merino rams to provide replacement ewes. This may slightly lower the cost of replacement ewes and reduce risk associated with bad seasons.

EverGraze regional advisory groups in each region are asking more questions to further integrate the research data. Some of the questions being investigated include;

- How would the perennial system perform in a 300 and 600 mm rainfall zone?
- How profitable is a fine wool enterprise based on perennials?
- What are the most profitable combinations of stocking rate, lambing time and weaning percentage?

While the modelling approach still requires further development it is providing useful insights into the value of perennial based systems beyond those tested at our EverGraze Proof Sites.

Sheep grazing lucerne in Wellstead, WA.

Table 1. Simulated effect of perennial pasture, stocking rate, weaning percentage, lambing time and livestock enterprise on gross margins for the Albany Proof Site (average annual rainfall = 467mm).

Scenario	Stocking rate (ewes/ha)	Weaning %	Average gross margin ($/ha)	Range of gross margins ($/ha)
Baseline farming systems				
Annual pasture[a]	6.5	125	230	-303 to 512
25% Perennial pasture[b]	6.5	125	247	-318 to 520
50% Perennial pasture[c]	6.5	125	250	-333 to 523
Stocking rate				
25% Perennial pasture	3.9	125	182	-139 to 281
	5.2	125	230	-220 to 407
	6.5	125	247	-318 to 520
	7.8	125	231	-430 to 596
	9.1	125	197	-550 to 683
Weaning percentage				
25% Perennial pasture	6.5	81	162	-312 to 330
	6.5	100	203	-329 to 406
	6.5	125	247	-318 to 520
	6.5	138	268	-322 to 552
	6.5	151	284	-323 to 594
Lambing time				
Annual Pasture lamb July	6.5	125	230	-303 to 512
25% Perennial pasture lamb July	6.5	125	247	-318 to 520
Annual Pasture lamb August	7.5	125	132	-393 to 520
25% Perennial pasture lamb August	7.5	125	163	-379 to 562
Livestock enterprise all 25% perennial pasture				
Merino x terminal sire	6.5	125	247	-318 to 520
Merino self replacing	6.5	123	255	-295 to 508
Crossbred ewes	6.5	144	244	-341 to 545
Beef cattle	1.2 (cows/ha)	94	-98	-523 to 132

a 100% Subclover/ryegrass/capeweed pasture.
b 75% Subclover/ryegrass/capeweed pasture, 17% kikuyu/subclover pasture and 8% lucerne/subclover/ryegrass pasture.
c 50% Subclover/ryegrass/capeweed pasture, 28% kikuyu/subclover pasture, 11% lucerne/subclover/ryegrass pasture and 11% tall fescue/subclover pasture.

Table 2. Simulated effect of different seasons on average gross margins for annual and varying perennial pastures at Albany Proof Site.

Scenario	Annual pasture	25% Perennial pasture	50% Perennial pasture
Dry autumn	$54	$79	$90
Dry spring	-$5	$10	$25
Wet spring	$380	$392	$385

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Can shrub belts provide recharge control?

Acacia podalyriiflora.

Over the last twenty years farmers have returned many trees and shrubs to the landscape. The benefits to farms can be significant and include livestock shelter, improved wildlife movement through corridors and biodiversity. However, in many situations the main purpose of plantings is to control recharge to minimise the impact of salinity.

Key points

► The shrub belts had little impact on the growth of the adjacent lucerne or annual pasture.

► Annual pastures used less water than the shrub belts.

► Lucerne and shrubs used similar quantities of water

► Lucerne used much more water and dried the soil more than the annual pasture.

► The addition of shrub belts resulted in only a small reduction in soil moisture at the bottom of the slope.

► Lucerne was most effective in reducing soil moisture at the bottom of the slope.

Where to establish trees and shrubs on a farm can be a complex decision, particularly in variable landscapes. Surprisingly, there is little research to assist farmers in making this decision.

The Wagga EverGraze Proof Site aimed to fill some of the gaps in this knowledge by examining the impact of shrub belts planted across slope on recharge and subsequent soil moisture at the bottom of the slope.

Two 10 metre deep shrub belts were planted 50 metres apart at right angles to the slope in annual pasture and lucerne pasture.

Impact of the shrubs on soil moisture was tested against the same annual and lucerne pastures without shrub belts.

Competition between the shrubs and pasture was measured. Measurements were taken to find out if adding shrubs to the pasture influenced soil moisture at the bottom of the slope.

The site experienced drought conditions from 2007 to 2009 and wet conditions in 2010 and 2011.

Shrubs planted at Wagga Proof Site.

So what did we find?

1. Shrub belts had little impact on growth of the adjacent lucerne or annual pasture. Soil moisture in the pasture areas between the shrub belts was largely unaffected, resulting in no impact on pasture growth but no recharge control either.
2. The annual pasture system used less water than the shrub belts. The belts created a small dry soil buffer in the area where the shrubs were planted. This would absorb more recharge water than the surrounding pasture (see Figure 1).
3. Lucerne and shrubs used similar quantities of water. This meant that shrub belts did not develop a dry soil buffer and lucerne without shrubs would provide recharge control equivalent to lucerne with shrub belts.
4. The lucerne pasture used much more water and dried the soil more than the annual pasture.
5. The addition of shrub belts resulted in only a small reduction in soil moisture at the bottom of the slope (see Figure 2).
6. Lucerne pasture was most effective in reducing soil moisture at the bottom of the slope. Adding shrub belts to the lucerne pasture did not dry the soil more than lucerne alone.

Do the costs stack up?

Shrub belts cost approximately $180/ha to establish and occupied 15% of the grazing area at Wagga. These costs need to be recovered from improved productivity in areas of the farm below the shrubs where water-logging or salinity effects could be reduced. That is a tall ask for any management strategy.

Including shrub belts in the annual pasture made a significant difference in water use and recharge control under the shrubs. But, as this was only 15% of the paddock area, it had only a small impact at the bottom of the slope. It is unlikely that this small change in the water balance would reduce the area of saline or water-logging at farm scale and increase productivity enough to cover the cost of shrub belt establishment or the ongoing loss of grazing area.

Lucerne pasture was the most effective management option. It occupied all of the paddock so no land was removed from production and it made a bigger difference in soil moisture reduction at the bottom of the slope.

Investment in perennial pastures over large areas is costly and must be appropriate for the livestock systems. While perennial pasture plantings will provide some salinity and waterlogging benefits at both a catchment and farm scale, this on-farm benefit may not be large enough by itself to warrant the cost of establishment. Consequently, additional benefits to the grazing system (eg. reduced supplementary feeding costs or improved productivity) are needed to justify a decision to sow perennials. Any benefit in recharge control may reinforce this decision.

The evidence from the Wagga EverGraze Proof Site cannot support the use of shrub belts for recharge control in environments similar to the Proof Site. This does not mean that farmers should not plant shrubs for other reasons.

The impact of shrub belts on lamb survival was the subject of another EverGraze experiment at Wagga using a similar configuration to the recharge experiment. A 10% increase in twin lamb survival was achieved in two out of four years at this site. The impact and potential use of shelter belts will be discussed in a future article.

For more information, download the EverGraze Exchange - Shrub belt hedges for shelter and recharge control from www.evergraze.com.au

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Figure 1 - Soil moisture beneath the shrub belts.

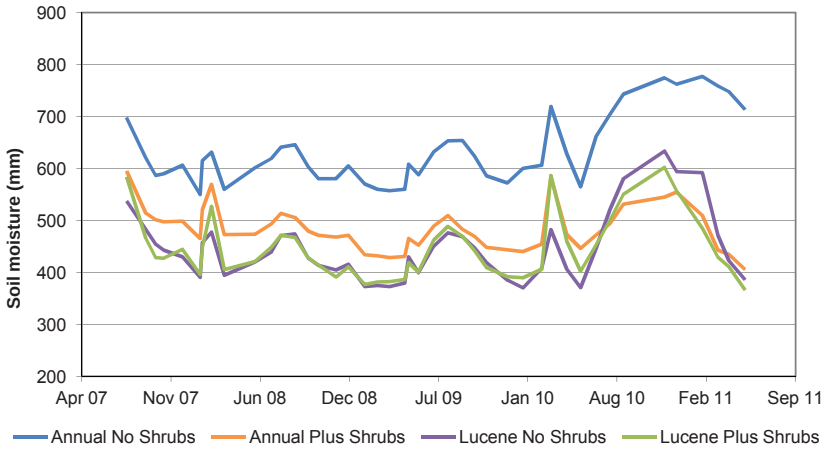


Figure 2- Soil moisture at the bottom of the slope.

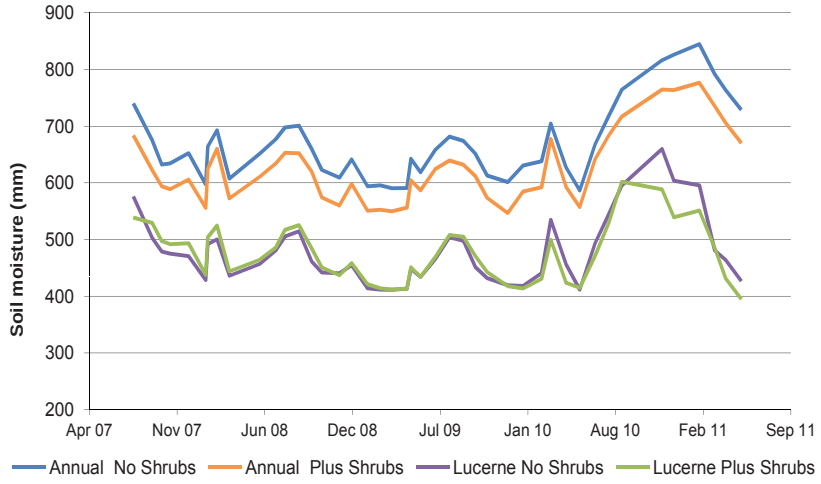
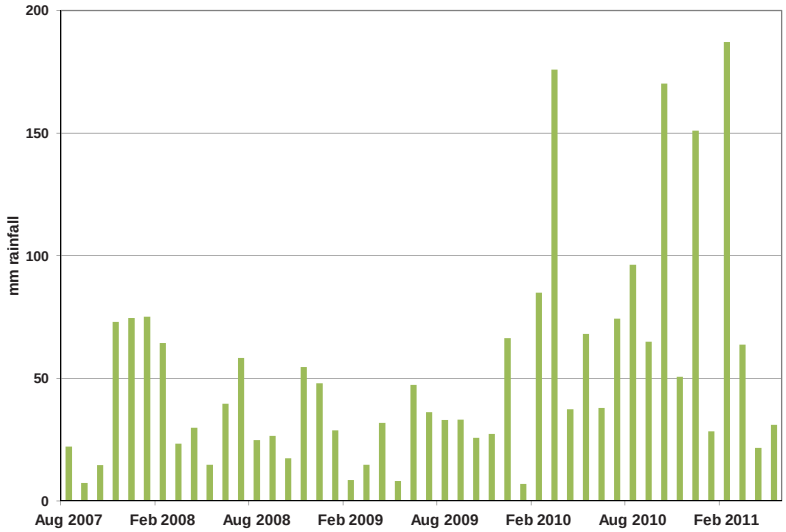


Figure 3 - Wagga rainfall (mm/month).



Curries – Sheltering their lamb income

Tim and Richard Currie, manage "Lyndoch Park" north of Casterton in South West Victoria.

They run a self replacing Multi Meat Flock where lamb survival and marking percentages are important profit drivers. They successfully established grass hedgerows at farm scale to protect lambing ewes.

EverGraze Supporting Site

Producer: Tim and Richard Currie

Location: "Lyndoch Park", Casterton, Victoria

Enterprise: sheep, cattle and cropping

Pastures: Phalaris and sub clover with some lucerne

The Multi Meat composite ewes contain the Booroola gene which can achieve scanning percentages of 200%. The challenge is to increase the survival of the many twins and triplets.

Lambing mid June has benefits but can also present risks associated with poor lambing weather and a lack of quality feed.

Modelling work conducted at Hamilton EverGraze Proof Site utilised long term weather records to illustrate trends in the level of chill (combination of wind, rain and temperature) causing heat loss exposure to new born lambs. On average, 10-13 days of each month between June and September are high risk for lamb mortality.

On the Hamilton EverGraze Proof Site, grass hedges were established to provide lambing nurseries in order to reduce wind speed and increase lamb survival.

Westerly winds were most dominant on the most inclement days, so the hedge rows were established north to south. These hedges increased lamb survival by 30%.

The Currie's were looking to provide both shelter and high quality feed to their multiple bearing ewes and saw the results from the Proof Site. "It was just a matter of establishing these hedges at a farm scale".

Establishment

Tim and Richard established 110ha of autumn and spring sown grass hedges as part of the pasture renovation program in 2010.

Phalaris and sub clover was sown in Autumn in 10, 20 and 30 metre bays with 1.5 metre strips being left for hedges between the bays.

The drill was blocked to 1.5 metres and grass hedges were sown into the strips at 10kg/ha.

The autumn sown hedges were set up along the contour of the slopes to prevent runoff and erosion. This meant they didn't specifically block the westerly winds.

Spring sown hedges were sown on a flat paddock allowing the hedges to be established running north to south. The pasture in the bays consisted of lucerne, phalaris and chicory.

Autumn sown grass hedge – phalaris and sub clover in the bays (Nov 2011). Inset:Tim Currie

Impact

Ewes were scanned and those carrying twins were put into the phalaris and sub clover paddock with hedges stocked at 5.2 ewes/ha (roughly 22 DSE).

The ewes preferentially grazed the phalaris and sub clover pasture and usually left the hedges alone.

The remaining twin bearing mobs were run at 18-25 DSE/ha on the most sheltered paddocks.

Marking percentages in the hedge rows were 159% compared to 157% in twin bearing mobs in unsheltered paddocks.

This is not significant but we think there are a number of reasons;

- Mild lambing conditions this year 2011 in June/July,
- Hedges were only a year old and not fully developed,
- There was a considerable amount of dry feed in the control paddock which would have also given protection.

Considerations

Sheep tend to leave the hedges alone as long as the feed between the rows is of high quality and there is an alternative source of roughage.

Autumn sown hedges need at least the first spring to go to head. Spring sown hedges need two years before providing good shelter from wind.

The hedges need to be sown at least 1.5 metres wide otherwise they seem to be out-competed by the sub clover and phalaris.

Nitrogen should be applied in spring when hedges are actively growing.

For further information see the EverGraze Action – Perennial grass hedges provide shelter at lambing. www.evergraze.com.au/fact-sheets

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Exciting developments in EverGraze

NEW Improving lamb survival brochure and national phone seminar

An integral driver of the success of sheep systems on EverGraze Proof Sites was to achieve high lamb weaning rates. Increasing weaning percentage by 10% can increase gross margin per hectare by 10% in prime lamb operations or by $5-$6/ewe. Weaning rates are a function of conception and lamb survival.

EverGraze will partner with BESTWOOL-BESTLAMB on Friday 11 May to conduct a national phone seminar to discuss this important issue with farmers. EverGraze and BESTWOOL-BESTLAMB networks will be informed of the details closer to the date.

The 'EverGraze Exchange - Improving lamb survival' draws together the science behind lamb survival (both from EverGraze and previous research) and provides recommendations for practices which can be considered to address lamb survival issues on farm. The EverGraze Exchange can be found at www.evergraze.com.au/fact-sheets

Regional packages – coming soon

The EverGraze team is busy forming recommendations from its national research and making them relevant to regional farming systems. EverGraze has developed recommendations for the feedbase, grazing management, livestock system, soil management and tactical management options to address regional issues. All of these are supported by evidence from whole-farm-system experiments and modelling that tell the full story around the profit, risk and natural resource management (NRM) impacts of change options within a regional context. Regional packages will be presented on a new website. The first packages are to come online in the second half of 2012.

Gippsland Regional Coordinator pilots EverGraze 'Whole Farm Grazing Strategies'

Claire Geri, DPI Leongatha, has joined the team as the new EverGraze Regional Extension Coordinator for Gippsland. Claire and the Gippsland team are packaging EverGraze principles and practices which are relevant to Gippsland and conducting training events with her team across the region. Claire has also been delivering the EverGraze Whole Farm Grazing Strategies training program with a local group of farmers and is assisting with its further development.

Geoff Saul and Anita Morant will be delivering Whole Farm Grazing Strategies in Hamilton from April. In its first year, the program will focus on helping farmers to apply the EverGraze principles for development of plans to address profitability, environmental and lifestyle issues on their farms. In its second year, the program focuses on working with the group to implement their proposed changes. EverGraze aims to run the program nationally by 2013.

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

Diary dates

March/April 2012	**Moriac Prograze course,** Moriac, VICTORIA	Lisa Miller, P: 03 5226 4070 M: 0418 171 178 E: Lisa.Miller@dpi.vic.gov.au
Wednesday 11 April	**Wagga Proof Site field day** Wagga, NSW	Nigel Phillips P: 02 6938 1981 M: 0427 102 707 E: nigel.phillips@industry.nsw.gov.au
Starting Tuesday 17 April	**Whole Farm Grazing Strategies course,** Hamilton, VICTORIA	Anita Morant, P: 03 5573 0732 E: Anita.Morant@dpi.vic.gov.au
Wednesday 18 April	**Pasture Update - soil health, pasture pests and sub-tropicals,** Bairnsdale, East Gippsland, VICTORIA	Darren Hickey, P: 03 5152 0496 M: 0457 609 140 E: darren.hickey@dpi.vic.gov.au
Friday 11 May	**National phone seminar** - Improving survival of lambs 12.00 to 1.00pm	Wendy Paglia, M: 0467 797 155 (works Mon, Tue, Wed)

Dont know where to start?
Contact your Regional Extension Coordinator

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Front cover photo: Morgan Souness inspecting kikuyu

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