EverGraze More livestock from perennials

Merino ewe performance

EverGraze research sites have joined Merino ewes to terminal sires with 150–750 ewes per site depending on experimental area and stocking rates. Our aim is to achieve high reproductive performance and lamb growth rates to generate high turnoff per hectare and to get a profitable return on the feed base at the site. Wool production from Merinos also provides 30-40% of the income.

The number of ewes and variety of forage types allows a comparison of survival and growth of lambs from a range of environments and from sown and native pastures. In 2008-09, Coopworth ewes were also used at Hamilton allowing a comparison of their productivity with that from Merino ewes.

Ewes at Albany graze paddocks of kikuyu, lucerne, panic and chicory; at Hamilton; perennial ryegrass, lucerne, tall fescue or chicory, while at Wagga; phalaris, lucerne and tall fescue are used. All perennials were established with sub clover and also contain volunteer annuals. Albury pastures are higher quality natives, mainly weeping grass (*Microleana* spp) and wallaby grass (*Austrodanthonia* spp).

At Orange, the native species are weeping grass, wallaby grass, red grass and spear grass with only small amounts of annuals for quality forage. Ewes have been managed using the target condition scores from the Lifetime Ewe Management website www.lifetimewool.com.au and supplemented as required to cope with the dry conditions.

At Tamworth, the results are on-farm performance of Merino ewes grazing unimproved native pastures dominated by red grass and spear grass without supplementation (see Table 1).

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FUTURE FARM



More perennials

Better livestock

Healthier catchments

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Merino ewe performancecontinued from page 1

Provided Merino ewes were ioined in condition score above 3, conception rates of 130 -155% were achieved even from native pastures. However, weaning rates were only 90 -120% highlighting a significant loss to weaning. Lamb growth rates to weaning were around 300 g/d for single lambs with slightly lower rates for twins and little difference between sown and native pastures provided ewes were at target condition score at lambing. The lower performance of the ewes at Tamworth highlight the difficulty of achieving the required condition targets on native pastures dominated by summer active perennials. There is a need to either include paddocks of other higher quality species or to provide supplements to improve ewe performance in winter.

At Wagga, two lambing times are compared. A Split Joining system has half of the ewes joined to terminals lambing in July while Merino lambs are born in September. Low growth of the September born lambs highlights the effect of the failed spring (2008) in this system and the benefits of Split Joining. See Wagga site report for full details.

Merino ewes had about 20 -30% lower conception rates than the Coopworth ewes. Survival of Coopworth lambs

EverGraze Proof Sites

There are Proof Sites in Orange, Tamworth and Wagga Wagga in NSW, Abury Wodonga and Hamilton in Victoria and Albany in WA. There are over 55 Supporting Sites across the high rainfall zones of southern Australia

For further EverGraze information and the latest research results, visit our website **www.evergraze.com.au**

was greater. Growth of the Merino lambs was only slightly less than of the Coopworth lambs. Lamb turnoff reflects both the carrying capacity of the pasture and differences in forage quality which impact on lamb growth rates. As might be expected, turnoff was greater from sown pastures which are grown on soils with higher fertility and water holding capacity.

Improving lamb survival

Research at Hamilton and Wagga looked at improving survival of twin lambs. At Hamilton, one metre wide tall wheat grass hedges were established at 10 m intervals perpendicular to the prevailing winds during winter. The area between the hedges were managed to ensure there was around 3000 kg/ha feed on offer pre-lambing so twin lambing ewes could be stocked at 20-30 ewes/ha.

Previous research has shown that if the chill index exceeds 1000 megajoules per square metre per hour, lamb mortality

key points

- Merino ewes achieved high conception and lamb growth rates.
- Potential for further improvement in weaning rates.
- Shelter improved survival of lambs.
- Native pastures similar per ewe production to sown pastures.

increases. The hedges reduced wind speed and generally kept the chill index between the hedges at less than 1000 MJ/m². The shelter had only a limited effect on survival of single lambs, but improved survival of twin lambs by about 20% and triplets by about 50% (see Fig 1).

At Wagga, hedges of native shrubs 50 m apart were used to provide shelter to twin lambing ewes. In 2008-09, the survival of singles without shelter and twins in the shrubs was similar, around 80%.

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Table 1. Reproductive performance of Merino ewes mated to terminal sires 2008 (* = Fat score measured at Tamworth)

Site	Pasture type	CS joining	Scan %	CS pre-lamb- ing	Wean %	Growth rate kg per day (singles)	Growth rate kg per day (twins)	Lamb turnoff kg/ha/100mm rainfall
Albany	Sown	3.0 Jan	155%	3.3	119%	0.28	0.28	44
Hamilton <i>(Merino)</i>	Sown	3.0 Mar	129%	2.9	98%	0.35	0.31	62
Wagga	Sown	3.3 Feb 3.4 April	152% 131%	2.9 3.2	89% 100%	0.37 0.21	0.37 0.21	46 38
Albury	Native - high	3.1 Feb	137%	3.2	116%	0.35	0.29	38
Orange	Native - medium	3.3 Apr	141%	2.7	108%	0.27	0.27	34
Tamworth	Native - unimproved	3.2ª	NA	2.4 ª	73%	NA	NA	NA
Hamilton (<i>Coopworth</i>)	Sown	2.9 Mar	179%	3.1	150%	0.38	0.33	98

Perennials perform in southern WA

Despite measuring pasture and animal production in three years where rainfall was only 50-70% of the long-term average of 550 mm, perennials out performed annual pastures at the Wellstead EverGraze site 100 km east of Albany.

Figure 2 shows total production from kikuyu, lucerne, chicory, a setaria/panic mix and annual pasture.

Annual pasture consisted of ryegrass, barley grass and sub clover. All perennials were also sown with sub clover. For the kikuyu pasture, sub clover dominates in winter with kikuyu coming to the fore in summer. All pastures were grazed by breeding ewes that lambed in July. Details of ewe and lamb performance are summarized in an earlier article.

Despite the dry conditions, the kikuyu and lucerne produced more than the annual pasture traditionally used in the area.

Chicory grew less than the annuals, due mainly to the lower production in winter. The chicory dried the soil and under the drought conditions experienced during 2006-08, the clover could not contribute in winter.

Setaria and panic are both sub-tropical species and took time to perform at their best. In 2006, this mix grew only a third the amount of the annual pasture but by 2009 was at least equal to the annuals.





These species have performed well north of Perth and only time will tell how they are suited to southern WA.

The nutritive value of the different species is shown in Figure 3. Chicory, tall fescue and sub clover provided the highest quality forage in winter. Sub tropical's kikuyu and panic were of lower quality but their place is to provide moderate quality forage in summer and autumn when annual dry residues are of very low nutritive value.



Chicory and lucerne provided the highest quality forage in summer and autumn.

Persistence of all perennials has been excellent. Kikuyu basal cover has been above 75% since establishment and lucerne has maintained density despite drought conditions.

Interestingly, both chicory and setaria/panic pastures increased in density due to a combination of new plants from seed and expansion of existing plants.

Summer active tall fescue died out within two years. However, in a separate trial, winter active tall fescue, maintained density for four years suggesting it is better adapted to the variable conditions in south-west WA.



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Paul Sanford

Wagga Wagga lamb production systems

EverGraze has a 60ha grazing experiment near Tarcutta, which is comparing the profit and environmental outcomes of four different farm systems.

Each of these systems is managed as a separate farmlet and has paddocks of lucerne, phalaris and tall fescue. Merino ewes of known high fertility are joined to either terminal or Merino sires.

As a result of the research, we will determine the Gross Margins of farming systems using terminal sires compared to Merinos and July versus September lambing.

It is important to recognise that perennial pastures can alter the timing of the supply of high quality feed, which affects the most profitable time to lamb.

Production systems

The first farm system, Winter Lambing Merinos, acts as a control and represents traditional practice for the region. This system consists of Merino ewes joined in February to Merino rams to produce replacement ewes, with excess ewes and wethers sold. This system has the lowest annual stocking rate, as ewes lamb mid winter when feed supply is most limited. This system has a feedbase where 20% of the farm is lucerne, 60% is phalaris and 20% is tall fescue.

Two September lambing systems are also being tested; one with the same feedbase as the Winter Lambing Merinos (Later Lambing); the other in which 40% of the farmlet is lucerne (High Lucerne). In both these systems Merino ewes are joined 50/50 to either Merino or terminal sires in April. Replacement ewes are kept, with all other offspring sold as store lambs after weaning. Because ewes in these systems

have lower nutrient requirements in July than the Winter Lambing Merinos, these systems run 70% more ewes/ha. The fourth system is 'Split Joining' and involves half of the Merino ewes joined in February for two weeks only to a terminal sire. aiming to finish the crossbred lambs by the end of the year.

The remaining ewes are joined in April to a Merino ram to generate replacement ewes. This system has a ewe stocking rate mid way between the other systems.

It is important to realise that due to the different lambing times and individual ewe requirements in July, the number of ewes per ha varies so that the feed requirements as DSE/ha is the same in mid-winter (see Fig 4).

Computer modelling

Computer modelling predicted the economic performance (based on an average-rainfall year) of the four systems. This modelling indicated the September lambing systems should be most profitable followed by the Split Joining and then Winter Lambing Merino.



key research

- Split Joining has performed better than other systems.
- Split Joining allows flexible sale options in spring
- Winter lambing ewes get priority for feed



Latest results:

From the research we have been able to determine the Gross Margins of the different farming systems. Note that these Gross Margins should not be compared directly with on-farm data without ensuring that the same methodology is used.

In the last three years with below average rainfall, Split Joining has been the most profitable (see Fig 5). In very poor years, such as 2006, winter–born first cross lambs can be sold at weaning at acceptable (35kg) weights. In better years they can be retained to finish to trade or export weights.

In three failed springs, the September lambing systems have produced lambs of low weaning weights (<30kg) while requiring extensive supplementary feeding.

Split Joining had the highest Gross Margin and kg of lamb/ha. The Gross Margins were higher than the Later Lambing as less supplementary feed was required. Split Joining introduced flexibility



into the system which was valuable in the recent dry years.

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Split Joining in practise in NSW

David Hewlett produces fine Merino wool at his 800ha property, "Blackburn" near Yass in NSW. He has implemented a Split Joining system based on current EverGraze research to capitalise on the demand for cross bred store lambs. He spoke with Jim Meckiff about the flexibility Split Joining has given him in his operation.

"I started joining Merino ewes to a Dorset ram four weeks ahead of the main Merino flock.

The ewes selected for joining to the Dorset ram are the older ewes and culls that are not wanted in the Merino flock.

The cross bred lambs are sold each year at the end of November", he said.

By lambing a few weeks earlier than the rest of the flock, the cross bred lambs gain a little more weight and present a little heavier at the store sales.

The cross bred lambs help increase production per ha/ewe, which helps with cash flow

If the spring does turn out to be 'average' then the pastures can be better utilised due to the higher stocking rate of heavier lambs.

I pregnancy scan the ewes in May and June to identify the wet, dry, twins and singles.

Early and late lambing ewes are separated to allow more efficient supplementary feeding.

Dry ewes are culled before the winter feed deficit starts to bite, so

Producer: David and Jenny Hewlett

Location: Yass, NSW

Property size: 800ha

Soils: Brown sandy loam to yellow clay on lower slopes

Enterprises: 3,500 Merino ewes plus progeny

Pastures: Mix of phalaris and sub clover, some oats, lucerne, 60% native perennial grasses

farm info.

valuable pasture growing in winter is utilised by productive sheep.

'Blackburn' has extensive shelter belts that stretch the length of the property.

This shelter, combined with suitably sized paddocks for lambing allows me to split mobs and manage them according to nutritional requirements.

Small mobs of 150 ewes, with a mix of older and maiden twin bearing ewes, are put in paddocks with the best feed and best shelter with a base pasture target of 1200kg DM/ha early in winter.

By lambing time, these pastures could be growing at 20+kg DM/ha/ day with a stocking rate matched to pasture growth.

Single bearing ewes are put in mobs of around 300 and a pasture base of 700kg DM/ha in early June. Pasture growth is expected to pick up by the last trimester of gestation. If supplementary feeding is required then a grain ration is fed in the paddock.

I have been pleasantly surprised the last few years with Merino weaning percentages over 110%.



Twin bearing ewes are placed in paddock with the best feed and shelter



David Hewlett

key points

- Split Joining provides flexible management options and marketing opportunities
- Early cross bred lambs increases profit
- Pregnancy scanning allows improved management of ewes according to their nutritional needs

It's better in the cross bred lambs, of course, but not bad considering the seasons handed out in the last few years on the southern tablelands. The beauty about the Split Joining system is, it has provided me with opportunities to keep my options open and creates



flexibility to deal with varying seasonal conditions."

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Hamilton research on 'plant for place'

At the Hamilton Proof Site, the research team are testing the EverGraze theory of right plant, right place, right purpose, with different perennial pasture systems.

Production systems

The systems being tested include:

► Best bet ryegrass system with Fitzroy on the gravelly crests, Avalon on the slopes and Banquet on the clay valley floor,

► *Triple pasture system,* SARDI 7 lucerne on the crests, Avalon on the slopes and summer active tall fescue in the valleys

► *Novel system,* chicory on the crests, Banquet ryegrass on the slopes and kikuyu in the valleys.

The pastures were established in 2004-05 with subterranean and white clover. The trials are now showing some strong trends in what have been difficult dry seasons.

Latest results:

6

The perennial pastures matched to the landscape with an overlay of good grazing management have shown increased productivity, persistence and profitability compared to current systems used in the region.

Utilising rainfall as it happens with diverse pasture systems delivered increased pasture production throughout the year and more flexible livestock management.

In particular, lucerne has been the outstanding performer. It responds well to summer rainfall and has been especially valuable in providing valuable feed in summer when other systems have needed supplementary feeding.

In 2007, the Proof Site had to destock on the ryegrass system due to lack of feed. The pictures

below dramatically show the difference in feed during February 2007.

Summer pasture growth does not have to come at the expense of winter production which is always limited and of high value in southern Victoria

In 2006 and 2007, this was proven with lucerne producing

key research

- Lucerne production and persistence is equal or better than ryegrass.
- Using several perennials matched to soil and landscape provides flexibility.
- Deep-rooted perennials dry soils effectively storing and using rain throughout the year.



similar amounts of pasture in winter as ryegrass (see Fig 6). Lucerne provides forage with high energy (digestibility 65–72%, metabolisable energy 8–11 MJ/ kg DM) and protein (12–24%). It is also an excellent source of calcium, magnesium, phosphorus and vitamins A and D.

A noticeable difference with the lucerne pastures is its ability to use water from depth. Soils under lucerne are dry down to 3 m whereas ryegrass pastures quickly wet up in winter. This means that the deep rooted pastures can more effectively store and use rainfall through the year. However, the downside might be less runoff to farm dams below lucerne pastures.

Lucerne must be rotationally grazed with a six week spell between grazing. Managed correctly, lucerne can persist for more than 10 years.



Feb 2007 - Sheep on Lucerne (Triple System) and on the containment Ryegrass

The lucerne, tall fescue and Banquet ryegrass has persisted well despite the dry conditions and is showing good basal ground cover.

In comparison, the chicory has not lasted as long as we would have liked and is reaching the end of its life at four to five years.

The kikuyu persisted well for two years and then declined.

The density of the Avalon and Fitzroy perennial ryegrass declined in 2006 but has since rebounded with new plants coming from seedlings.

In a changing climate there are many rewards in having a range of perennials. These include;

- ► Increased summer pasture production and feed quality,
- ► Increased animal production, stocking rates & profit / hectare,
- Increased water use,
- Increased flexibility to manage variable seasons &



Increased persistence.

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Lucerne in practise in west Victoria

Mark Jarvis has introduced 100ha of lucerne into his sheep and cropping enterprise at his 1200ha property 'Aramis' at Vasey in western Victoria.

He shared with Gill Fry what he has seen as the benefits and opportunities of incorporating lucerne into his farming operation.

"I started growing lucerne in 2004. It cost me \$225/ha to establish, including lime, chemicals, seed and 50 kg/ha of DAP, but not including contract or machinery costs. But in hindsight, it has been a good investment. It has provided me with flexibility and opportunities in variable seasons.

When it comes to sowing lucerne, preparation is everything. I spray topped to ensure I had a good weed control as weeds can be an issue. I decided to spring sow so I didn't lose any winter production.

Soil tests were conducted, which showed a low pH so I needed to add 2.5 t/ha of lime. The pH now is 5.5, which is pretty good.

To maintain productivity we have added another 2.5t/ha of lime.

The lucerne was sowed by direct drilling using press wheels to ensure good seed contact with the soil.

It is important to protect the young plants in the first summer so that they establish well. Dont graze it and just slash it if it is getting into the flowering period. Producer: Mark and Sally Jarvis Location: Vasey, 45 km north of Hamilton Property size: 1220 ha Soils: Duplex grey loam Enterprise: sheep/crop Pastures: 100ha of lucerne, balance sub clover, phalaris, ryegrass

Production has been excellent. The lucerne grew 9.1 t/ha in 2008/09. That's great high quality feed over summer when everything else has thrown in the towel. It responded really well to summer rainfall which gave it an extra boost.

The lambs have grown well and I haven't needed to supplementary feed them over this period. Merino lamb growth rates were 175 g/d in January and February 2008.

I have also been able to conserve the high quality fodder as hay or silage, which gives me the opprtunity to supplementary feed when required or sell the hay.

Grazing management is important. I crash graze the lucerne with big mobs and then spell it. This is to ensure it is not overgrazed. It is vital to protect those young shoots at the crown.

The other good thing about lucerne is that it provides a seed-free environment for the weaner sheep. We get no seeds in the fleece which improves our wool quality and give us a better wool return. Really the lucerne



Lucerne at 'Aramis'



farm info.

Mark Jarvis

 Preparation is everything when sowing lucerne.

key points

- Lucerne responds well to summer rainfall providing excellent summer feed.
- Lucerne provided flexibility in variable seasons.

has given us options and flexibility in our enterprise. It sets up young sheep for life, it has reduced labour, produces high quality feed and increased overall production. As a added bonus it also offers some fire protection. It is great to look at a green paddock when everything else is dry and barren.

I have been so impressed with adding lucerne into the system that I am contemplating sowing 25 to 30% of the farm down to lucerne in the future".

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Merino ewe performancecontinued from page 2

These results highlight that sheltered lambing areas will improve survival of twin and triplet born lambs that are rapidly affected by cold winds. Dystocia has also been a significant problem with the Merino's mated to terminal sires. At Wagga, detailed studies have shown 50% of lamb deaths in the singles and 20% in twin lambing ewes were due to dystocia. Further work is required to determine target condition scores for single lambing ewes to better balance lamb survival and growth to weaning. Selection of rams may also be used to reduce dystocia problems.



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EverGraze Events in your region

VICTORIA	Go to www.	Go to www.evergraze.com.au for more details				
Tuesday 16th March	Beaufort Supporting Site update	David Clark P: 03 5343 5236 E: garvagh@bigpond.com				
Tuesday 23rd March	Ararat Profitable perennial grazing systems for central Victoria	Rob Shea P: 03 5352 1357 E: yadin@netconnect.com.au				
NSW						
Thursday 11th March,	Coonamble, Grazing management days	Luke Beange P: 02 6881 1294 E: luke.beange@industry.nsw.gov.au				
Friday 12th March Kelvin Natural Grasslands breakfast		Peter Dawson P: 02 6764 5984 E: namoi.grasslands@cma.nsw.gov.au				
Thursday 25th March	Coonabarabran Grazing management days	Luke Beange P: 02 6881 1294 E: luke.beange@industry.nsw.gov.au				

EverGraze survey

To help understand the impact of EverGraze, a telephone survey of producers and extension agents who have participated in EverGraze events will be undertaken from mid March. The survey will ask people about what they have learnt from attending EverGraze activities and changes on-farm by producers or to recommendations by agronomists.

We value your feedback to keep the project on track and help plan future work. We understand not everyone likes telephone surveys. If you do not wish to participate in the survey, please email info@evergraze.com.au or call/text 0419 328 590 and we will ensure that you are not included in the survey.

What's new?? New pasture cost calculator

A new calculator to help work out the costs and benefits of resowing pastures has been developed by EverGraze. Called the "Pasture Cost Calculator", the tool allows inputs of costs of resowing, the benefits of the resown pastures to livestock, soils and the environment at any given financial values (ie different interest rates, tax rates, gross margins etc). The tool uses Microsoft Excel and allows comparison of two different resowing options compared to current practice. A free version of the tool can be down loaded from Information section of the EverGraze website **www.evergraze.com.au** from April 2010.

www.evergraze.com.au

Disclaimer

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