



Evergreen FARMING



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There has been strong and growing interest by Kangaroo Island producers in establishing kikuyu pastures, with almost 500 ha sown in 2010...





Grazing Barley

Evergreen Committee member Luke Caelli from west of Ravensthorpe is well known for his perennial pastures. But he is also pushing the boundaries with grazing crops. This 95 ha paddock of early April sown Gairdner Barley is growing so well Luke can't keep on top of it. Initially stocked with 400 lambing ewes, another 400 have recently been added to utilise the feed. It will be grazed until early July and then locked up for harvest. Photo 5 June 2011.

New Zealand?

This scene of sheep packed to the rafters on a small paddock reminds me of New Zealand. But in fact it is one of Michael and Kate Morrison's perennial pasture grazing cells west of Three Springs. They boxed up all their lambing ewes and are rotating them through all their perennial pasture paddocks, which look great after some handy Autumn rain. This type of system is just ideal for managing perennial pastures. Photo 10 June 2011.

No Panic at Walkaway

There has been enough autumn rain at Walkaway this year to give perennials such as this Panic a real boost. This is in contrast to annual pastures which have still struggled with the irregular rain. Farmers with large areas of perennials have been able to reduce, and in some cases totally eliminate, expensive supplementary feeding. Excuse the pun, but these farmers aren't feeling anywhere near as panicky as a result. Photo 26 May 2011.



Native Grasses

The north eastern Wheatbelt experienced a very wet summer, with some farms receiving over 300mm. Native grasses popped up everywhere and provided very valuable grazing for those with livestock. One farmer was able to run sheep at 7 DSE/ha for over 3 months, with the sheep coming off mud fat. Interestingly, a lot of these native grasses are actually annuals and not perennials and only germinate and grow in wet summers. Photo 12 April 2011.



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This Newsletter is a celebration of the ten years that Evergreen Farming has been operating as an incorporated body. This is a great achievement for a Not for Profit organisation that is completely self funded, by membership as well as income from Projects that we have successfully applied for. As part of this celebration it is worthwhile reflecting on how Evergreen came to be formed and how it has progressed since that time.

During the early 1990's Tagasaste had begun to be seeded over a large area of the Mid-west of WA as well as a smaller area around Esperance. This represented a new paradigm in farming systems on the poorer grey sands in the medium to high rainfall region of WA. In 1996 the Dept of Ag at Moora produced a newsletter called Tag Talk. Tim Wiley was a major contributor to this newsletter. A group was formed to promote Tagasaste and other fodder shrubs, called the West Midland Fodder Systems Development Group.

Around the same time Bob Leeson had begun experimenting with some perennial grasses from Queensland that he felt could adapt to some particularly wet areas on the property that he managed at Cataby, near Dandaragan. With Tim Wiley on hand to enthusiastically encourage this

foray into the unknown world of sub-tropical grasses, Bob's array of plant species on trial expanded. As word of these plants success spread, so did the farm tours..... a group of farmers in the ute with a carton of beer. So began the forerunner of the successful Evergreen Field Days.

In 2000 a group of these farmers around the Bibby Springs area near Badgingarra decided that there was a need for a larger, more professional group to promote perennial pastures to the broader WA farming community. This small committee of local farmers engaged the assistance of consultant John Duff to help run the group on a professional basis. It was decided that the name of the group should be Evergreen Farming, and that it needed to become incorporated.

In mid 2000 in my role as President of the WMFSDG I entered into discussions with Evergreen about amalgamating the two groups. I thought this was a great idea, and so did our membership. This is how the final Tag Talk Newsletter in Nov 2001 described the change... "The committee that has overseen the tagasaste research and extension has decided to amalgamate with the Ever Green Farming group. Bob Wilson said that it was an opportune time to work with the Ever Green group. "We are both looking at extending our green feed through the use of perennials. Funding opportunities are limited more than ever and it would be disastrous if we competed against each other for these limited funds"

And so Evergreen Farming Inc began.....

Cheers Bob

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Ten Evergreen Years

Article by John Duff – Executive Officer

The past 10 years with Evergreen have been a very enjoyable and rewarding journey. Working with a bunch of very enthusiastic farmers and meeting many passionate members over those years has been a great experience. I can clearly remember my first meeting with Phil Panizza at Badgingarra in April 2001. I wasn't sure what to expect. I certainly had no thoughts that it would lead to an "association" that would last at least 10 years. Some of the key moments along the way that stick in my mind are the first official Evergreen Field Day on the 26th of October 2001, attended by 140 people and opened by the ubiquitous Wilson Tuckey. Most attendees signed on to be inaugural Evergreen members that day. Unfortunately I was not there but my offsider at the time, Alison Lulfitz was. Alison (who is Bill's daughter) was the first editor of the Evergreen Newsletter.

The story of Evergreen is considerably longer than 10 years. The farmers of the Bibby Springs LCDC and Tim Wiley of the Department of Agriculture had been investigating perennials since at least 1990. In 1990 Jesse Skoss started two sets of trials to test a range of sub-tropical perennial grasses and legumes in the West Midlands area. The Department of Agriculture also began a research project testing a range of annual and perennial pastures for sandy soils. In these small plot trials the winter growing perennials (e.g. Phalaris, Cocksfoot, Fescue) failed to survive summer even when there was considerable summer rain. However to the surprise of the locals and many West Australia experts, it was the summer growing or 'C4' perennial grasses that survived. Experience now shows these grasses survive on a wide range of soil types and through very dry summers. Unfortunately these early research projects were not continued due to a lack of funding support. The concept of summer growing pastures appeared too radical for the Western Australian farming paradigm at that time.



John Duff – Executive Officer

Extract from Evergreen Archives...

So why aren't we growing perennial pastures on a large scale now? The reason is simple according to Tim Wiley, a Woolpro Development Officer at the Department of Agriculture – until now we have never tried to.

"All over WA you can find examples of perennial pastures growing" says Tim "Examples range from temperate perennial grasses in the very high rainfall southwest to dryland lucerne in the low rainfall northern wheatbelt - there are perennial pastures growing on the poorest sands of the West Midlands through to the sticky clays of the wheatbelt"

Tim tells us that we always come across experts who tell us that it won't work whenever we try something new. "Trying something new and failing doesn't prove it can't be done, but one success proves something is possible".

There are many factors to consider when choosing the types and species of perennials to grow, the biggest being whether the paddock will be used for cropping or for permanent pasture.

Lucerne is an ideal short term "phase pasture" for use in an integrated system that includes cropping. It is easy to establish, fixes nitrogen for following crops and tolerates non-selective weed control methods. Evergreen farmers are involved in trials of other temperate perennial legumes that fit into cropping systems by Geoff Moore at the Department of Agriculture.

Permanent pastures that are established where cropping is not viable should be based on perennials and have as large a number of species as possible in the mix, Tim says. Having a broad range of species will ensure that a pasture is not susceptible to a particular insect or disease, covers the variability in soil type within paddocks, is less variable in production levels between years, and has species at peak feed quality at different times over the whole year

Permanent pastures should be designed to have different types of species that complement each other and, Tim adds, annual pasture species are still an important component of a perennial based system.

Continued...

However a small group of farmers and a local adviser were excited enough to continue on farm testing and development of these perennials. Some of these pioneering farmers now have hundreds of hectares of these pastures. These early pioneers talked regularly and toured each others farms to share their experiences. As well as informal paddock inspections they also organised field days with the local AGWEST staff. Gradually through the 1990's the interest and numbers of farmers using perennials increased.

In 1998 the group named themselves the 'Evergreen Group'. Their first action was to conduct a survey of farmers to identify the key issues and set priorities. The Evergreen Group held field days and a study tour to the eastern states in 2000. But in 2001 things got really organized with the development of a business plan and the appointment of an Executive Officer (John Duff) and the official incorporation of Evergreen Farming on 31 July 2001. At the time Phil Panizza was the chair. At the first meeting in January 2002 Phil Panizza resigned to pursue Shear Express and David Monks took over the reigns (initially as acting until he was formally elected). The Committee was keen on local boy Phil Barrett-Lennard but as yet there were not enough funds to pay young PBL so he went to work for John Duff & Associates on a range of projects including Evergreen Farming. John, Phil and David Monks set about writing an application to AWI for support in 2002. Many discussions with various AWI Officers and one or two directors followed resulting in the project being funded in 2004. That was the first really big step for Evergreen. It allowed Evergreen to employ Phil for a significant period which then really got the technology moving forward.

Around the early 'noughty' years we also gained the support of CSBP (fantastic corporate supporters of agriculture in this state) and Farm Weekly, with the first Evergreen Farming Page appearing in February 2002. The first newsletter was published in March 2002, and since then there have been 4 editions per year of at least 16 pages. Due to the AWI project we were able to produce the first full colour edition of the Newsletter in November 2004. Colour is a much better way of reporting on perennial pastures than B&W.

The Department of Agriculture, particularly some of their pasture production people, Irwin Hunter, FarmBis, Heritage Seeds and the Australian Government program Caring for Our Country have all been vital supporters of Evergreen farmers. In 2004 we also started the first of six annual Pastures for Profit Seminars. The first was in September 2004 at Highfield Jaloran Stud when speakers including Bruce Cook from Qld and Kevin Bell. This event was the start of "Evergreen goes South" as headlined in the newsletter. This marked the spreading of Evergreen interest to the whole of WA. 2006 saw National recognition via the Australian Farm Journal. Evergreen has been on the cover of AFJ on two occasions which in rock and roll terms is akin to being on the cover of the Rolling Stone magazine twice.

In 2008 Evergreen merged with the Lucerne Growers Association (WALG). In my opinion this has been a very successful merger that is yet to provide it's greatest benefits for members, WA farmers and consumers. In the early 1990s a push to grow Lucerne to help fight soil salting due to rising water tables was started in WA. In 1995 a GRDC funded research project was established to evaluate Lucerne's performance compared to annual pastures. To assist researchers and farmers the Great Southern Lucerne Growers Group in 1996 (GSLGG) was formed. In 1998 GSLGG expanded to cover the remainder of the WA agricultural region was renamed Western

Australian Lucerne Growers Inc (WALG). Between 1998 and 2001 WALG advised over 500 farmers on lucerne establishment and management. From 1995 to 2001 the area of lucerne in the WA Agricultural region increased from 5,000 ha to 170,000 ha. WALG chairs included Richard Sounness, Jeff Patterson and Marcus Sounness. WALG won a national Landcare award and one of its founding members Geoff Bee won an individual National Landcare award. Some of the researchers who worked with WALG included Roy Latta and Pedro Evans, Lisa Jane Blacklow 1995-2000. Lisa was instrumental in enthusiastically developing WALG into a successful extension model. Others followed. Perry Dolling took on the researcher role once Roy left. Tom Bailey started as a technical officer for WALG in August of 1998 the year WALG was incorporated and remained a strong contributor until 2010.

So since the 10th of April 2001 Evergreen has grown to over 600 members from WA and other Australian States. Has had three major projects, run many successful field days and seminars and most importantly has been a leader in putting perennial pastures firmly on the agenda for most grazing farms. Some 300,000 ha of perennials have been sown and grown in WA. Evergreen now covers all farming systems and plant options across the whole landscape. It is very well positioned to draw upon the inspiration of the early Evergreen, WALG and SPA committee members to really drive pasture systems to new heights in WA. This is critical as the World is challenged with feeding more and more people from finite resources. Evergreen has been and can be part of addressing this challenge. I have been very fortunate to be able to be part of the Evergreen approach to this challenge and hope to continue to be part of the future.



Good luck Erin...

Now as I head into a gap year wandering the globe to bring back new and exciting ideas to Evergreen (hold that thought) I hand Evergreen to one of its most treasured daughters in Erin Gorter. Erin ("show us your grass") was the inspirational 3rd President of Evergreen. With a quick wit and keen eye for opportunity Erin effectively sourced and developed many ideas and opportunities for Evergreen and I am sure will do a great job as the second Executive Officer.

Good luck Erin.



Kikuyu pastures: do they pay?

Article by Greg Johnsson

Background

There has been strong and growing interest by Kangaroo Island producers in establishing kikuyu pastures, with almost 500 ha sown in 2010. The results are promising in that we know that kikuyu will grow and persist but what is not known is the actual economic benefits (and costs) of a kikuyu pasture compared to an annual pasture on Kangaroo Island.

What was done

A trial was set up on John and Jo Symons property on Turkey Lane, the Kangaroo Island Sheep Production Group focus farm. Two adjacent 6 ha paddocks were selected. One (Control) had a pasture of annual grasses plus sub clover, the other (Kikuyu) was sown to kikuyu in 2008 at the rate of 2 kg/ha and at the time of the trial had 40% kikuyu groundcover.

Both paddocks were grazed with the same mob of adult sheep until 10th Sept 2010. 50kg/ha urea was applied to both paddocks on 12th Sept and both paddocks were then shut up for trial. The aim was to accumulate Feed on Offer (FOO) to approximately 3.5 tonnes per hectare before the trial began in late October. However, the excellent Spring conditions and the urea effect meant that we started with considerably higher FOO than planned (see Table 1 below).

On the 23rd October 2010, a mob of 120 merino weaner wethers from the one ewe age group were weaned and weight matched into two mobs and placed in each paddock (10 weaners/ha). The weaners were weighed prior to entry to the paddock and drenched with Cydectin LA, bulletted with Selenium and Cobalt bullets and tagged to their trial group before being placed in to their respective paddocks. They were set stocked in each paddock until shearing on the 18th April 2011. The sheep were monitored for weight gain/loss, wool growth, worm counts, Vitamin E status and general health. They were hand fed as required to maintain weight or allow for slow growth and the costs and final returns for each mob were calculated.

Weather conditions

The trial site normally experiences a Mediterranean climate with very little rainfall between December and May. A very good Spring in 2010 resulted in green annual pastures until late November with some green persisting in the lower lying areas until mid December. December, January and the first half of February were typically warm to hot and dry, but a large rainfall event of 68mm on the 18th February resulted in a general germination of annual species in both paddocks. This rain was followed by a wet March (88.4mm - see Table 2).

This meant that both paddocks in the trial sustained an excellent annual pasture germination that was well established by early March and continued through until shearing, with the pasture growing above 50kgs DM/ha throughout that time.

Table 1

	Control	Kikuyu
Feed on offer (FOO) t/ha	6.0	5.2
Pasture composition		
% kikuyu	0	0
% sub clover	30	85
% capeweed	40	10
% annual grasses	30	5
Crude Protein (CP)	14.3	20.5
Metabolisable energy (ME)	9.36	10.35
Dry Mater %	16.6	14.7

Pasture composition 20th October 2010

Table 2

Month	Rainfall mm	Ave rainfall mm
2010		
November	37	25
December	27	22
2011		
January	6	18
February	68	19
March	88	30
April	30	50

Rainfall during the trial compared to 52 yr average rainfall

Excellent growth rates...

Continued...

Results

Growth

Chart 1 below shows the trend in average body weight for the two groups of weaners.

From weaning until the weighing on 10/12/10, both mobs gained weight at a similar rate, the gain being driven by residual annual feed value. There was no visible kikuyu in the kikuyu paddock when stock were first introduced due to an average pasture height of 15cm and 85% clover composition. Kikuyu became apparent only when the annual pasture senesced and collapsed to allow light in to the base of the sward.

By early December, the annual pasture in both paddocks had died with just a small area of late green in a low lying patch of the Control paddock. The weight gain through December in the Kikuyu paddock was driven by residual dry clover value plus the emerging green kikuyu. Lupins at 50g/hd/day were fed to the Control group throughout December to supply some extra protein to the dry residual annual pasture. The average weight of the Control group remained constant through December.

In January the Control group lost weight even though they had 4 tonnes dry annual pasture plus 100g Lupins per head per day. In contrast, the Kikuyu weaners maintained weight on a lower FOO level thanks to the 100g/day lupins plus the green Kikuyu pick.

After the weighing in early February, supplementary feeding rates to both mobs were increased with the Control mob receiving Lupins at 150g/hd/day plus Barley at 150g/hd/day, whilst the Kikuyu mob were fed Lupins at 150g/hd/day plus Barley at 100g/hd/day.



Significant rainfall from the 18th February onwards lead to a general germination of annual pastures in both paddocks and a rapid build up of green FOO. Supplementary feeding was stopped to all sheep by 18th March 2011. Excellent growth rates at the March and April weighings were driven by the abundant new seasons pasture growth in both paddocks, although the Kikuyu wethers maintained a weight advantage of 0.5 kg liveweight built up over the Summer.

Standard Deviation of weights

Chart 2 shows the changes in the standard deviation of weights (StDev Weight) in both groups. The StDev Weight illustrates the variation of weights around the mean and gives an estimate of the spread of

weights within each management group. In weaners over Summer and Autumn, an increasing StDev Weight will often indicate the development of a "tail" in the mob long before it is obvious visually.



The StDev Weight was almost identical initially as the 2 mobs were weight matched. However, the Control group StDev Weight increased steadily throughout the trial period compared to the Kikuyu group. This meant that in the Kikuyu grazed group, the weight range remained tight as the lighter sheep at weaning grew at a faster overall rate than the heavier sheep at weaning, whereas in the Control group the smaller sheep did not do as well as the heavier sheep (Table 3).

This was an interesting result as weaner mortality in merinos through the Summer and Autumn is highly correlated to the body weight at the time of feed senescence. These results indicate a lower potential for light weaner mortality when grazing kikuyu pastures over the Summer and Autumn

Table 3

	Weaning weight	
	< 26kg	> 26kg
Kikuyu	18.7	17.7
Control	17.1	17.6

Difference in total weight gain in weaners less than 26kg at weaning for the two paddocks

Vitamin E

Vitamin E is supplied to sheep in green feed. Vitamin E deficiency is common in weaners on Kangaroo Island in Summer and Autumn and results in muscle damage, weight loss and failure to thrive. At the weighing on February 11th 2011, five randomly selected sheep from both groups were blood sampled and tested for a range of serum parameters including Creatinine Kinase. Creatinine Kinase (CK) is an enzyme released from damaged muscle in to the blood stream and is a proxy for Vitamin E deficiency. Table 4 presents the results of the blood testing.

There was a significant difference in the average CK values between the two groups indicating muscle damage which was most pronounced in the Control group. Both groups required and were given Vitamin

Continued...

E supplementation (2000i.u. orally) but Control group was most affected. At the time of blood sampling the kikuyu green pick was less than 50kg/ha DM. It was likely that the Vitamin E deficiency was contributing to the weight loss in the Control group through January and early February.

Supplementary feeding

Table 5 summarises the supplementary feeding regimen for both groups. Both groups were trail fed at the same time every second day. The cost of supplementary feed was calculated using an actual delivered on-farm cost of \$295 per tonne for Lupins and \$182.50 per tonne for Barley.

Even in this year of very modest supplementary feed demand, the Kikuyu group received \$0.96 per head less supplementary feed.

Worm monitoring

At each weighing, ten sheep at random from each group had faeces collected for individual worm egg counts (WEC). Both groups maintained negative WEC throughout the duration of the trial.

Wool production

Shearing took place for both groups on 18th April 2011. At shearing, a midside wool sample was taken and the shorn wool weight including the belly was recorded for each sheep. The midside samples were tested by Riverina Wool Testers for fibre diameter, CV of diameter, yield, length and strength. A wool price per kg was then computed using WoolCheque software (Southern prices, last 12 months average) and a 90% clip basis was applied to account for the percentage of non fleece wool vale in the clip to give an estimated fleece value for each sheep. Table 6 shows the average fleece values calculated for the trial.

There were significant differences in wool production in the two groups. The Kikuyu group measured an increase in clean wool production of 0.15kg or 5.7%, an increase in average fibre diameter of 0.6 microns and an increase in tensile strength of 5 N/kT. Due to the finer average micron in the Control sheep and the micron premiums available between 17 and 18 microns over the last 12 months, wool value per head was higher by \$0.61 than in the Kikuyu group.

Sheep deaths

There were no deaths recorded in either group during the trial period.

Net economic benefit

In this trial, the net economic benefit for the sheep in the kikuyu pasture was:

Extra weight 0.5kg @ \$2.00 per kg liveweight = \$1.00

Lower fleece value of \$0.61

Lower supplementary feed cost of \$0.96

Total economic benefit of kikuyu = \$1.36 per head or \$13.60 per hectare

Discussion

The results of the trial confirmed what we expected to see from kikuyu pastures – better growth rates through Summer/Autumn, lower supplementary feed cost, more wool growth with a higher tensile strength and better Vitamin E status.

Table 4

	AST	CA	TP	CK	PHOS	MG
Control						
1	96	2.62	67	444	1.90	0.98
2	143	2.63	69	3799	2.65	0.95
3	98	2.85	82	2120	2.22	1.09
4	102	2.78	81	2129	2.24	1.08
5	98	2.47	61	241	3.13	0.95
Averages	107	2.67	72	1746	2.43	1.01
Kikuyu						
1	90	2.60	61	242	2.07	1.08
2	96	2.75	68	605	2.00	1.09
3	98	2.60	70	242	1.93	1.07
4	94	2.54	63	195	2.27	1.02
5	89	2.63	67	472	2.08	1.01
Averages	93	2.62	65	351	2.07	1.05
Normal range	40-360	2.27-2.70	56-78	8-100	1.29-2.87	.95-1.24

Arrange of serum parameter taken 11/2/11

Table 5

Rate g/hd/day	Start date	End date	Cost/hd/day	Duration	Total cost
Control feeding					
50	4/12/10	8/1/11	\$0.01	35	\$0.52
100	9/1/11	11/2/11	\$0.03	33	\$0.97
150	12/2/11	2/3/11	\$0.04	18	\$0.80
150	12/2/11	8/3/11	\$0.03	24	\$0.66
75	9/3/11	18/3/11	\$0.01	9	\$0.12
				Total Feed Cost per head	\$3.07
Kikuyu feeding					
100	14/1/11	11/2/11	\$0.03	28	\$0.83
150	12/2/11	2/3/11	\$0.04	18	\$0.80
100	14/2/11	8/3/11	\$0.02	22	\$0.40
50	9/3/11	18/3/11	\$0.01	9	\$0.08
				Total Feed Cost per head	\$2.11

Supplementary feeding amounts and costs

Table 6

	Greasy Fleece Weight (kg)	Yield (%)	Clean Fleece Weight (kg)	Micron (um)	CV (%)	Staple Strength (N/ktex)	Staple Length (mm)	Return (\$/hd)
Kikuyu	4.0	69.40	2.79	17.8	18.5	53	83	\$40.89
Control	3.8	69.46	2.64	17.2	18.5	48	83	\$41.49

Continued...

The seasonal conditions that were experienced during the trial period (late Spring finish and very early season start) meant that the Control sheep consumed green growing pasture for a much higher percentage of time than is normal for our area. We would normally expect to be supplementary feeding weaners from December until mid-late May, whereas in the trial, they were only fed from December to mid March. Therefore, feed costs were much lower than normal and the wool growth and body growth performance of the Control group was much better through March, April and May than normal.

The kikuyu paddock was established in a very poor Spring in 2008 and is slowly covering the paddock. However, at the time of the trial, kikuyu only constituted 40% of the ground cover of the paddock. Even given the kikuyu availability limitations due to ground cover and the 1 in 20 year season start in 2011, the weaners grazing kikuyu still recorded a net economic advantage of \$1.36 per head or \$13.60 per hectare. All of this net economic benefit occurred between mid December 2010 and mid February 2011 corresponding to the fall in residual dry pasture digestibility and protein in the control paddock. These results could be considered as the minimum expectation of economic benefit for kikuyu on Kangaroo Island.

Kikuyu ground cover of 80-100% in "average" Summer/Autumn rainfall years could be expected to provide an economic benefit of 3-4 times this result, as March and April normally have the highest supplementary feeding costs and the lowest wool growth for the year. Previous experience has shown us that kikuyu will provide green FOO in March and April, the amount depending on rainfall occurrence, whereas there is normally no green annual feed available.



The Kikuyu paddock (main photo) in early December 2010 had plenty of dry subclover in addition to the green kikuyu, whereas the Control paddock (inset) was just a sea of Barley grass...

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Evergreen ready to sow Tropical Pasture Mixes.



North Mix

Variety	% in Mix	Comments
Cafton Panic	60%	Productive and persistent drought tolerant species with good palatability
Rhodes Grass – Fine Cut, Katambora & Callide	20%	Quick to establish and moderately tolerant of salinity. Callide: productive palatable grass suited to fertile soils. Katambora: productive, more stoloniferous grass, suited for erosion control. Fine Cut: fine leaf selection, has been selected for its improved grazing qualities, of uniform maturity and high yielding.
Signal Grass	20%	Forms a dense soil cover, valuable grass in the humid tropical regions.



South Mix

Variety	% in Mix	Comments
Cafton Panic	60%	Productive and persistent drought tolerant species with good palatability
Rhodes Grass – Fine Cut, Katambora & Callide	20%	Quick to establish and moderately tolerant of salinity. Callide: productive palatable grass suited to fertile soils. Katambora: productive, more stoloniferous grass, suited for erosion control. Fine Cut: fine leaf selection, has been selected for its improved grazing qualities, of uniform maturity and high yielding.
Splenda Setaria	20%	Hardy, palatable, coastal grass suited to sub tropical regions.



Rhodes Grass



Signal Grass



Cafton Panic



Splenda Setaria

The business of farming at Williams

Article by Perry Dolling - DAFWA Katanning and Sally Thompson - Sowing Seeds

A holistic approach to farming has taken Ross and Natalie Major in a new direction one that has become a lot more enjoyable. This enthusiastically explained by Ross at a field day about the business of farming held the Major's property at Williams and hosted by the Bugs and Biology Grower Group on the 19th of April. The journey began in the early 2000s when a friend attended a holistic management course (RCS "Grazing for Profit"). This made Ross curious but at that stage it had little impact on Ross. A year or so later Ross attended a "Low stress livestock handling" course and he was further exposed to an alternative way of farming.

Ross eventually attended a number of courses between 2006 and 2008 which taught him more about holistic management and specialist skills required for a new farming system. They included a KLR course on livestock trading and the RCS "Applied grazing" and livestock nutrition courses in Dubbo. Ross also went on tour of a number of farms in NSW which were in a 7 year drought. Ross could see that on one farm in particular, using the principles of holistic management, the soil was improving even in the drought. Ross was a bit apprehensive about embracing holistic management as it conjures up an image of a secret society where people wear robes and bow to a high priest. However, on the contrary he met a number of people who were at ease with themselves and were confident about the future. This has inspired Ross to get the right balance between people, land and business.

While all of this was going on Ross was farming like he has always farmed. He had his home farm at Williams and a half share in a farm at Yearling for a number of years. The Yearling experience was a good and bad, it was a run down farm which they built up but did not make a lot of money. In 2007 Ross leased a farm closer to home and everything looked rosy as crop prices were good. At this stage he was cropping about 50% of the arable area he owned and leased. However, being exposed to different ideas by the courses he attended and the people who he had met, Ross' thinking had changed. His aim was to use cropping to get out of cropping that is to make a lot of money from crop so that he did not have to crop. Fast forward to December 2009 and harvest was not going well.

Ross sat down in late 2009 to plan a new future. One aspect that was weighing on his mind was that he employed a good workman to help with the cropping but the new future required less labour. However a tragic event in the workman's family led to the workman resigning in early 2010. In addition, the farm he was leasing became unavailable as the owner decided to come back to farming. Ross could have leased more land to ensure his machinery was being fully utilised but this would have increased the stress levels and combined with the lack of profits and the damage to the land resulted in a move away from cropping. So in 2010 they started to sell off machinery and some land for lifestyle blocks. The selling of

these resources, in part, is to reduce debt. In 2010 they had 40% of the farm or 400 ha in crop and this year there will be no crop other than 100 ha of canola stubble which will be leased out.

The business structure

The Major's are developing a system with reduced environmental impacts and low vulnerability to adverse events such as declining terms of trade and weather variability. The enterprise involves running breeders at a third of the estimated carrying capacity and trading livestock to utilise any excess grass. If there is a drought then they will reduce livestock purchases and it allows them to de-stock over summer if there is no feed. By doing this they can maintain ground cover. As Ross explained if you have all your livestock as breeders and there is a drought then it is difficult to sell sheep especially if they have lambs at foot. Trading has always been part of their enterprise but to manage risk, to increase income and to maintain ground cover, trading will become more important. Ross has estimated that 1300 ewes and some cattle is about 30% of capacity. Trading brings risks in terms of biosecurity. However, Ross will reduce this risk by separating breeders and trade livestock using the Albany Highway as they have land on both sides and a central laneway system.

The Major's have a feedlot and this has and will be a key factor in his trading operation. The feedlot allows increased turnover no matter what the seasonal conditions are. Sufficient scale is important to his operation as margins are often small. Ross is reducing overheads and will continue to reduce them so that he remains competitive no matter what the price is. To reduce risk Ross will sell and buy in the same market so that there is some cover for falling prices. Ross will use the knowledge and skills from the KLR course to help him manage risk.

Cell grazing

A key aspect to holistic management is grazing management to allow the pasture to develop sufficient leaf area to maximise growth rate before it is grazed. Cell grazing also has benefits in terms of maintaining cover and utilising animal impact to break down dry unpalatable grass and to stimulate germination of desirable plants. The Major's plan is to role out wire and water to subdivide their paddocks to manage grazing. They have been trialling cell grazing since 2008 and currently have subdivided 150 ha into 10 paddocks with paddock size between 8 and 17 ha. On this area they have recently been grazing 600 ewe weaners and 22 cows. The aim is to have 30 paddocks in this cell and a total of three cells with 30 paddocks in each over the whole farm. This year he will have more time to get the system right because he will not be involved in cropping. This will include monitoring grazing days, livestock condition and welfare, soil and plants.

In terms of subdividing the paddocks Ross has used the "Weston fencing". This consists of 3 wires (bottom and top live and the

middle the earth) with widely spaced steel posts and short droppers to hold the wires apart. The subdivision is organised in a wagon wheel arrangement to minimise the number of watering points. Ross is also experimenting with the Kwi Tech fencing which is temporary electric fencing that can be rolled out using a 4-wheel motor bike. The Kwi Tech system will allow Ross to buy time so that he can plan where the semi-permanent fencing and water should be placed. The Kwi Tech system will also be used to create animal impact and more intense grazing by further subdivision of his existing paddocks.

Ross has found that cell grazing has reduced time because fewer large mobs can be fed and monitored easy compared to lots of mobs. By intensively grazing Ross can see that he is growing more grass and developing more robust plants. Ross is still working out how to best manage lambing mobs because they are difficult to move but this is a small problem compared to the many benefits.

Perennials

Ross showed the group a paddock which was sown to lucerne, Tall fescue and chicory in 2007 in an experiment conducted by DAFWA. Ross considered the soil hard country with numerous rock outbreaks, there was not sufficient litter and the surface soil was prone to hard setting. With the establishment of the perennials and the application of rotational grazing Ross has found that there was less soil capping. Ross has also seen increases in ground cover in other parts of the farm with the rotational grazing including a non-wetting Mallet hill.

Previous to the trial paddock Ross has grown lucerne but most of this has been removed because the paddocks went into a cropping phase. Ross believes that the productivity of perennials can be increased by the use of better varieties compared to the ones sown in the trial paddock. Ross took us to another site where he was planning to establish perennials. This resulted in a discussion about how best to establish perennials. Ross will spread seed in May to about 50 ha in 7 paddocks and using animal impact to give sufficient soil contact. He considers this as a trial but has seen others achieve successful establishment using this technique. The mix will contain phalaris, cocksfoot, Tall fescue and lucerne. He will put lupins with the mix to try and get greater animal impact. The final visit on the field trip was to visit an old trial on perennials and they were knee high as a result of the rain in January and run-off from a nearby road. This productivity has encouraged Ross and has given him something to aim for. The long-term aim is to have every hectare under perennial pastures.

Conclusions

Ross' journey started when he was exposure to an alternative farming system but at the same time he realised that his current conventional farming had problems. Profit was lacking, people were stressed and the landscape was hurting. Initially he thought they could get to a better farming system by making sufficient money out of cropping but that did not work. In early 2010 a series of events forced the Majors to make a key decision which resulted in a new approach. One that was livestock based using breeders, trading and feedlotting. Cell grazing and perennials will become key components of the new system. It is early days for the Majors and trial and error will be part of the business of farming. However, they believe they are closer to balancing people, profit and environment.

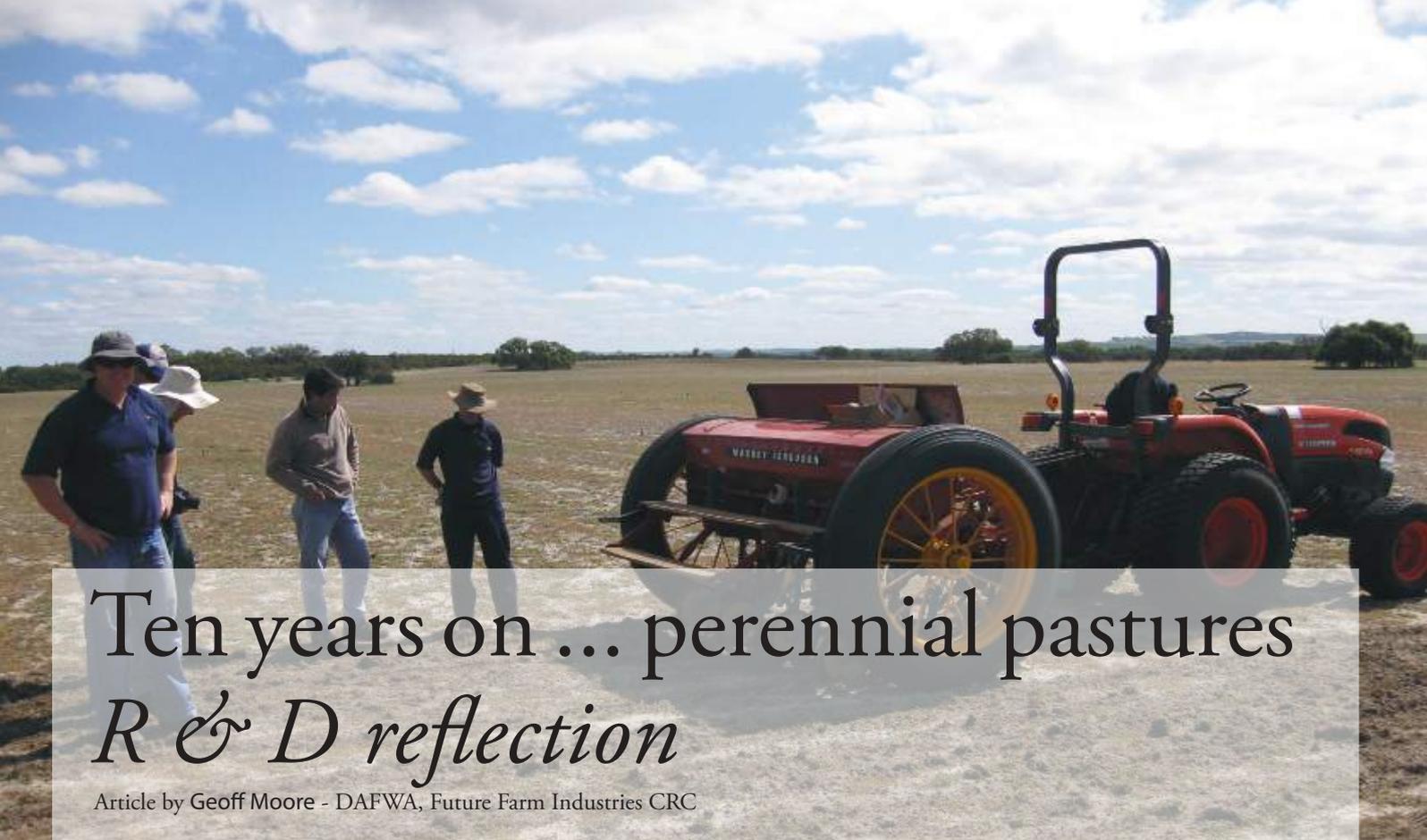
The business of farming...

The business of farming field day held at Ross and Natalie Major's property at Williams was a mixture of theory and practice. In the morning Chris Schied from PrincipleFocus went through the key aspects in balancing people, profit and the environment.

Chris explained how you can re-design and re-invigorate your business and how a grazing management system based on perennials can reduce costs, at least maintain production and improve the environment.

In terms of profitability, Chris explained that there were three measures which influence profit; the amount of overheads (machinery, labour and land), the direct costs and the gross income. The overheads stay constant with scale where as the direct costs and gross income increase. To determine how profitable your business is relative to others Chris explained you can compare to industry benchmarks using a range of ratios related to the overheads, direct costs, gross income and your assets. Chris has done this for a range of clients and made the following conclusions about the top 20% of business ranked in terms of the industry benchmarks:

- They get the right structure, the balance between overheads, turnover and gross margin (gross income minus the direct costs)
- They fully utilise overheads
- They specialise, this focuses energy, reduces overheads and keeps it simple
- They have a basic scale of turnover
- They increase gross margins by efficient conversion of direct costs
- They only lease if it improves utilisation of overheads to improve turnover
- Gearing or borrowing is important to them but it is balanced (not too little and not too much)
- They have an excellent system and risk management strategies
- They match enterprises to environment and personalities
- Once in the top 20% turnover drives profitability and some of them expand and replicate the business



Ten years on ... perennial pastures *R & D reflection*

Article by Geoff Moore - DAFWA, Future Farm Industries CRC

I would like to congratulate the Evergreen Farming group on its achievements in the first 10 years! Well done to the dedicated committee members who make things happen, it has taken a lot of determination and perseverance to get to where you are today.

Evergreen Farming is a vibrant, forward-looking organisation which after joining with the Lucerne Growers Association now has more than 500 members. Most importantly Evergreen has been instrumental in taking perennial pastures from a largely 'fringe' activity into mainstream agriculture.

With some help from colleagues here is a snapshot of some interesting developments in perennial pastures R & D over the last 10 years.

From a big picture perspective the drivers for changing to perennial-based systems have evolved. Following a series of dry years there is more emphasis on productivity-based drivers, a reduced emphasis on salinity control, while climate change and managing variable seasonal conditions has become increasingly important.

Roy Latta led a team which showed that lucerne pastures generally have similar productivity to annual pastures, but the seasonal feed distribution is different. They also demonstrated the high water use of lucerne and showed that it can be grown on marginally acid soils. However, the area of lucerne appeared to plateau well below the potential, so Perry Dolling undertook a social science survey to investigate the key drivers and barriers to adoption. Producers predominantly use lucerne in two ways. Firstly there are producers who use lucerne to solve a particular problem and secondly there are those who integrate lucerne broadly into their farming system.

In 2001 the area of lucerne was 170,000 ha, but in 2011 there is only 100-120,000 ha. This decline is attributed to the series of dry years which reduced the productivity of the system and consequently increased the payback time, combined with a reduced risk of salinity and low livestock prices (until recently).

In terms of sub-tropical grasses, we are now confident that sub-

tropical perennial grasses will be around in the medium to long-term. We know which species are suited to the soils and climate in WA and conversely which are less suited.

Establishment of sub-tropical grasses has improved dramatically over the last 5 years, apart from 2010 when there was no spring rain. A major contributing factor has been a greater understanding of the seed biology and agronomic requirements, which has resulted in an establishment package for sub-tropical grasses. The contribution of innovative farmers from Evergreen Farming, Evergreen agronomist Phil Barrett-Lennard, FFI CRC Establishment project and regional producer groups have been a fundamental part of this improvement.

There would not be the interest in Pasture cropping today in WA if not for the passion of Col Seis the NSW farmer who has spoken at several Evergreen events. The Future Farm Industries CRC (FFI CRC) EverCrop project with David Ferris has focused on pasture cropping across sub-tropical pastures compared with native grasses in the east. Results have been very promising for enhancing winter feed and hay production, but mixed for taking crops through to grain.

In terms of systems research, EverGraze has the goal of developing perennial-based livestock systems that increase profit and NRM outcomes. While the field work in WA was plagued by drought early on, the team led by Paul Sanford has demonstrated that on the south coast growing 2 to 3 perennial species with complimentary feed profiles can substantially increase profit provided 20 to 40% of the farm is perennial-based. One of EverGraze's key messages has been 'the right plant in the right place for the right purpose' this along with a systems approach has led to a subtle change with producers now putting more focus on their livestock goal (e.g. kg lamb/ha) when introducing perennials into their feedbase.

Mike Hyder and the Grazing Systems Analysis (GSA) team have been running closed farmlets at Mt Barker for 7 years, comparing an annual pasture system versus a perennial pasture system (kikuyu, lucerne, tall fescue) under grazing. They found that in some years perennials can reduce ewe/lamb supplementary feed requirements

(by 22%); provide extra grazing days to weaned lambs and result in a higher proportion of finished lambs. There were no additional husbandry costs with perennials and by following Lifetime Wool principles GSA has consistently achieved >100% lambing.

Saltbush came back into favour through the SGSL project. Ed Barrett-Lennard demonstrated the usefulness of saltbush acting as a water pump to reduce waterlogging and improve the environment for understorey species. Hayley Norman and the CSIRO team have shown the importance of managing the inter-row pasture to have a productive saltbush system; the added benefits of vitamin E for animal health and productivity and the potential for new lines of saltbush with improved nutrient value, palatability and productivity. The Enrich team with Dean Revell have undertaken some innovative research assessing fodder shrubs not only for nutrient value and productivity, but also for a range of traits including plant bio-activity for improved gut function and health, plus NRM benefits. Overall, more than 100 species have been assessed and a number demonstrate the multiple benefits which could be used in a diverse mixture to complement existing fodder shrubs, tagasaste and saltbush.

In terms of adoption, the area of kikuyu on the south coast has increased from an estimated 60-80,000 ha to 150,000 ha over the last decade, while the area of sub-tropical grass-based pastures in the NAR is estimated to have increased to more than 50,000 ha from a small base. An exciting development in recent years has been the dramatic increase in productivity and profitability of cattle producers on the south coast in Matt Ryan's Beef Profit Partnership groups who have changed from set stocking to rotationally grazing their kikuyu pastures. This demonstrates how perennial-based farming systems need to be fine-tuned in order to maximise the benefits to producers. The sub-tropical grass based pastures in the Northern Agricultural Region (NAR) are most likely under-performing and current research is endeavouring to improve productivity through companion plants, whether that is annual legumes or grazing oats.

The use of temperate perennial grasses like phalaris, tall fescue and cocksfoot which are widely grown in the eastern states is still low in WA, although a number of studies have shown their potential in high rainfall areas. If producers move to rotational grazing to increase production from annual pastures it will open the opportunity to use these grasses more widely.

Funding has gone through cycles from scarce to bountiful and back. At one stage National Landcare funding employed more than 90 NRM project officers across the agricultural area in WA, but when that funding dried up, many capable and enthusiastic young people left the industry, maybe not for 'greener pastures', but for a job. Likewise research funding has gone in cycles. R & D on perennial pastures in WA has benefitted from the two Co-operative Research Centres, the so-called 'Salinity CRC', and the Future Farm Industries CRC. Researchers from these CRCs have evaluated a wide range of perennial plants including native shrubs (Enrich), temperate perennial grasses, herbs, grazing and acid-tolerant lucerne, alternative perennial legume options and sub-tropical grasses. Some plants show potential but have inherent weaknesses which are difficult to overcome, for example, lotononis is a promising warm season perennial legume, but it cannot be established reliably on sandy soils.

Looking forward there are some new perennial plants and varieties which will be released within 2 to 3 years.

A perennial lotus (birdsfoot trefoil) variety developed by Daniel Real will have application in high rainfall pastures in WA and has shown promise in field trials at Waroona. SARDI will release the first lucerne



variety targeted specifically for WA, as 50% of the parents are lucerne plants collected from long-term trials in the WA wheatbelt. A new panic grass variety will be released, which was selected for southern Australia and has a higher tiller density and increased biomass production. A soft-seeded variety of the short-lived perennial fodder legume sulla is currently being developed to remove the requirement for de-hulling.

With a slightly longer time-frame, tedera is a new perennial legume (sub-shrub) which is drought tolerant and has an ability to retain green leaf much longer than lucerne. Tedera is showing potential in both low rainfall eastern and southern wheatbelt, plus high rainfall areas like Mt Barker. To borrow a sporting analogy it is the 'great white hope', so hopefully it fulfils its promise.

As adoption of a new technology increases, inevitably new challenges arise. These challenges need to be addressed or future adoption will be curtailed. For example, this is now happening with both the sub-tropical grass-based pastures in the NAR with cases of secondary photosensitisation and low nitrogen constraining productivity and on the south coast with producers with a high proportion of kikuyu running into winter feed gaps.

Carbon farming is still on the agenda, but recent data shows it may be a bonus rather than a mainstay for livestock producers.

We look forward to working closely with producers from Evergreen Farming to help them meet the challenges and to grasp the opportunities which arise over the next ten years.

KIKUYU
Stands the test of time

Morgan Sounness
0427 471 057

Kim Sounness & Co

Of drought and flooding rain...

Article by Jill Griffiths - Future Farm Industries CRC

While floods and heavy rains have fallen across eastern Australia, the Western Australian wheat belt remains in drought. This situation has presented Enrich researchers with a unique insight into how forage shrubs perform in good seasons and bad, and in both cases, the news is good.

The Future Farm Industries (FFI CRC) funded Enrich project has three main species evaluation field sites — Condobolin, NSW, Monarto, South Australia and Merredin, WA - and a number of smaller test sites across Australia. During the past year, Condobolin has experienced one of its best years with plentiful rainfall, while Merredin has experienced one of its worst. Researchers will soon take this year's formal measurements at the sites. Anecdotally though, forage shrubs look to have proven their worth at both sites. At the Merredin site, despite the extreme dry, the shrubs have shown remarkable growth. Throughout 2010, only 158 mm was recorded at the Department of Agriculture and Food (DAFWA) Merredin Research Station; in a 'normal' year, it would be in the vicinity of 310 mm.

Tanya Kilminster, a DAFWA farming systems development officer based in Merredin, said sheep were put in to graze the shrubs during July 2010. Preferences for different shrub species were recorded and then heavy grazing used to get even defoliation across all species. "The whole area was completely defoliated - only sticks were left," Tanya said. "Spring was very dry. We had 16 mm of rain during August and a further 8 mm during September, yet from that we have had a huge amount of re-growth. We had 66 mm over two days during January and there's certainly feed there again now, even though it is completely bare between the shrub rows and in the surrounding paddocks."

Key Points

- Forage shrubs have performed well at Enrich sites in both eastern and Western Australia despite dramatically different seasonal conditions.
- During drought in WA, the forage shrubs were the only feed available to livestock grazing the site.
- Results from the east reveal that inter-row pasture is a key factor in the available feedbase during better seasons.



Plentiful rainfall has led to phenomenal growth in shrubs and inter-row pasture at the Condobolin site (Photos: CSIRO)

Contrasting conditions

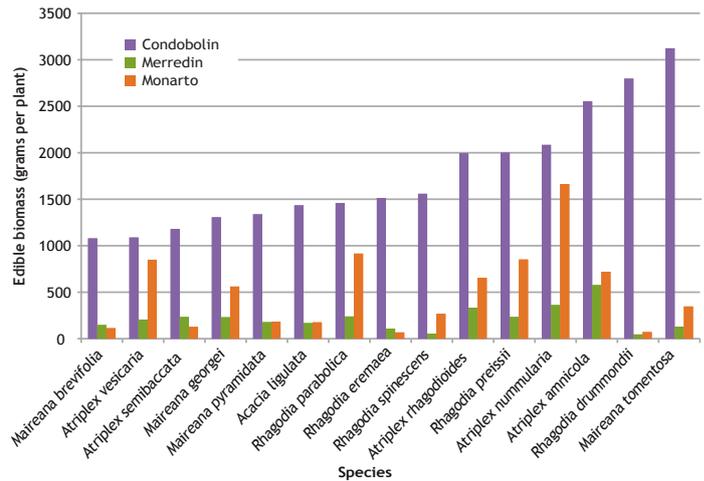
In contrast, 2010 was one of the best years Condobolin has experienced during recent times. At the research site, 424 mm of rain fell over 106 rain days. Peter Jessop (NSW DPI) said the Condobolin site was grazed during May 2010. "When the sheep were put in to graze, there was significant pasture (about 4000 kg/ha) in between the shrubs. But the sheep ate the shrubs as well, following an initial period of refusal," Peter said. "By the end of the grazing period (about five weeks) the shrubs were completely defoliated but there was still pasture in between the rows. When we measured them during December, the shrubs had almost completely recovered except for the loss of a few less-grazing tolerant species; they were in full leaf. And there was still ground cover between rows."

SARDI researcher Dr Jason Emms, who works on Enrich, visited both sites during March. "You couldn't get more contrast in two sites in terms of shrub and inter-row pasture growth," Jason said. Jason said there had always been a difference between the two sites, due to soil types and climate. Comparative measurements from past seasons have shown that to be the case. But this year the difference between the sites is even more pronounced. "The feedbase at Condobolin is enormous," Jason said. "We haven't measured the sites yet, but I estimate there's about 5-6 tonnes of dry matter per hectare at

Condobolin. At Merredin, the biomass is nowhere near that - it might be about one tonne per hectare. The ground in between the shrubs is completely bare, so if it wasn't for the shrubs, there would be no feed at all. The contrasting seasons at the two sites has also shown us which species respond well to different conditions. Species that are performing well in dry and wet environments and on two different soil types are much more likely to have wider adaptation than are species that are only performing in particular conditions."

Flexible forage option

Enrich project leader Dr Dean Revell (CSIRO) said the comparison of the two sites was a graphic illustration that forage shrubs perform well in the best and worst of conditions. "What's really interesting here is by chance we have been given a graphic illustration of how well forage shrubs perform in the dry and the wet," Dean said. "In both cases, the shrubs have been actively growing and providing valuable feed. The contrasting seasons have given us a clear indication of what the shrubs can do - at Merredin they continue to grow, so we can hope to always achieve that. Condobolin shows what they can do under optimal conditions. The inter-row pasture will always be important - it is the critical component of the feed base. The more we see and the more we learn, the more we understand that to be the case. But we also know the shrubs are additional to the inter-row pasture. Having the shrubs does not stop the inter row pasture - we saw that at Condobolin this year. Condobolin also showed us that shrubs provide additional feed in wet years. Merredin highlighted that during dry years shrubs provide feed when there is little else on offer - they act like an insurance policy. Unlike most insurance policies, you can claim on them every year, in good times and bad, without a penalty." Jason said people often think shrubs just tick along slowly. But the growth at Condobolin proves that when conditions are optimal they can respond quickly. "Forage shrubs can take the opportunity that comes with good seasons. And in bad seasons, they provide a back-up," Jason said.



A new booklet "Perennial Forage Shrubs - Key Findings from Enrich" has just been released. It lists the top-performing shrubs for a range of parameters, such as shrub edible biomass, digestibility and rumen fermentation, crude protein, minerals, rumen bioactivity, palatability and reduction of gut parasites. An extensive table of all species tested in the Enrich project is also included. An electronic copy of the booklet can be downloaded from the FFI CRC website: www.futurefarmonline.com.au

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Evergreen Farming 10 year anniversary quotes...

Ed Barrett-Lennard (Research Officer, Centre of Excellence for Ecohydrology, DAFWA, University of Western Australia)

“The truly remarkable thing about the Evergreen Group is its survival. The most important farmer group that I have interacted with over the last decade has been the Saltland Pastures Association. However the SPA kept going mainly on the enthusiasm of a very small core group, and now sadly it has succumbed. I wish the Evergreen Group the very best on this occasion and I look forward to it taking a stronger role in the area of saltland pastures.”

Tracey Kira (Development Officer – Esperance, DAFWA)

“What I noticed in 2002 was that the Evergreen group raised the awareness of perennials in Esperance via their seed mixes and then further built people’s interest with their events. They created a stir and hum that put perennials on the lips and front of mind of livestock farmers and this seed they sowed has grown into passion and commitment to perennial farming systems.”

Perry Dolling (Research Officer, Katanning, DAFWA, Future Farm Industries CRC)

“Evergreen has played a major role in researching and promoting perennials. It is a network that has been pivotal to my work over the last several years.”

Looking forward: “Farmers require on-going support to assist in the adoption of perennials and therefore Evergreen is important to the process. To remain relevant to its members Evergreen will need to continue evolve new ways to communicate relevant research.”

Paul Sanford (Research Officer, Albany, DAFWA, Future Farm Industries CRC)

“In the last decade Evergreen has effectively supported producers interested in perennials through down to earth field days on local properties and valuable information delivered through their newsletter, website and seminars. As a researcher in perennials this helped me immensely to get new ideas to those who can implement them on farm. Well done Evergreen you can proudly say you have made a difference. “My hope is that in the future perennials will become a common choice for forage systems over a much greater area of the south-west of WA. This will of course require a much more diverse range of robust perennial options.”

Dean Revell (Research Scientist, CSIRO, Future Farm Industries CRC)

“Evergreen has helped open our minds that productive systems can be just that – productive – year round. They’ve shown that by incorporating new and different perennial forages, and improving livestock management, we can start to imagine systems with no ‘feed gaps’.” In next 10 years: “I think Evergreen can help by encouraging us, through long-term testing and demonstration, that a good pasture might actually be patchy and diverse. These are common features of natural systems in variable and resource-limited environments, like ours, but too often overlooked in agriculture, and rarely studied in detail in short-term projects.”

