



Recent dry conditions haven't slowed down the subtropical perennial pasture seeding programs of farmers in the Northern Agricultural Region. In fact, the dry conditions of the last few years have actually accelerated the interest in perennial pastures, given their advantage over annual pastures in these poor years. To give an indication of the scale of adoption, 3 of the largest farmers / seeding contractors in the region have sown well over 1000 ha each this year. That is in addition to the many other farmers and contractors who have sown smaller programs. Let's hope some spring rain is forthcoming and well prepared paddocks, like this one sown by Murray Green at Gingin, turn into an oasis of green summer feed.

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Lucerne cover crops

This trial at Darkan is examining the effect of different cover crop sowing rates and configurations when establishing lucerne. The plot on the left has barley sown at 80 kg/ha but only in every second row, while the plot on the right has barley sown at 40 kg/ha but in every third row. Some plots have no barley, while others have barley sown on every row with the lucerne. Photo 21 Aug 08



Senate Committee visit to WA

The Senate's Rural and Regional Affairs and Transport Committee is holding an inquiry into Climate Change and the Australian Agricultural Sector. Bob Wilson and Tim Wiley flew to Canberra in late June to present their submission on soil carbon. As a result, the Committee flew to Murray Carson's farm at West Binnu to view perennial pasture developments first hand. Senators Glenn Sterle and Kerry O'Brien are seen here admiring the root zone of a subtropical perennial pasture. Photo 19 Aug 08.



Trial Site at Manjimup

The Manjimup Pasture Group has set up a large variety evaluation site this year just east of Manjimup. A wide range of species are being tested. The light coloured cross strip is where ProGibb (Gibberellic Acid) was applied in early August. The light colour is due to the plant's cell size rapidly increasing, diluting the amount of green chlorophyll. The economic responses are best in cold conditions on dense grassy pastures. Photo 4 Sept 08 courtesy Paul Omodei, agVivo.



Pasture Cropping at Dongara

Craig Forsyth of Dongara has pasture cropped this old, low density subtropical perennial grass paddock with white lupins this year. It was sown with knife points and press wheels in early May following a knockdown of SpraySeed, and has also received selective post-emergent sprays for both annual grasses and broad leaves. The crop is podding up well and Craig expects it to yield between 1.0 and 1.5 ton/ha. Photo 4 Sept 08.



Committee Column

Erin Gorter (President), Kojonup

One of the highlights since the last newsletter has been the announcement that Evergreen Farming has been successful in receiving Federal Government funding as part of the Caring for our Country program. This will enable your group to continue the positive work being done throughout WA, along with fostering a stronger

relationship between leading WA grower groups – WA Lucerne Growers, Saltland Pastures Association and Evergreen Farming. A project such as this is a huge undertaking and we believe will have benefits and positive ramifications for producers throughout the state.

2008 has seen another successful Pastures for Profit workshop series with nearly 200 people attending between Mt Barker, Dandaragan and Esperance. This year I managed to join the P4P 'Roadshow' and attended each location. This gave me an opportunity to meet with members throughout the state and get a better feel for what is happening beyond the boundaries of Kojonup! It was interesting to see and hear a wide range of topics, covering both high and low input systems. Most of the presentations are available in the member's section of the website so I urge you to visit the website to view these.

On the home front, Thys and I are currently busy sowing this year's perennial pasture program. The success we've had from our first paddock of a mix of lucerne and chicory has encouraged us to sow another area on some sandy gravel country. We've fenced off the lighter sand in this paddock (some with rushes and therefore water!) and will sow kikuyu for the first time. I am really keen to see how it grows in our relatively cold part of the state. The other end of the paddock is loamier, and will be fenced off and sown to a mixture of lucerne and winter active Tall Fescue next autumn. Deciding on which species to use on each soil type has been a challenge but, as always, the good advice available through Evergreen has been invaluable.

I hope the rain has reached all of you at long last and that you all have a favourable finish to the season, leaving plenty of moisture in the soil profile for the 'other' season – the summer active perennial growing season! I look forward to seeing many of you at the AGM on 25th September at CSIRO headquarters in Floreat.



Committee Exposé

Craig Forsyth, Dongara

Craig Forsyth runs an innovative cattle breeding, trading and backgrounding operation at Irwin. He has developed a wagon-wheel cell grazing system which has transformed his 2,800 arable hectares into 54 paddocks. Once the system is fully established Craig aims to turn-off 4,000 to 5,000 cattle annually while maintaining low stocking rates in the summer months to ensure sustainability. Perennial pastures are an integral part of the total grazing in Craig's system. Large areas have been sown to both subtropical perennial grasses and tagasaste.

One not to stand still, Craig is trialling Pasture Cropping this year and has sown an older, low density perennial grass paddock to lupins. So far, so good, as he reckons it is set to yield at least 1 ton/ha, probably more.

Craig has noticed this year that perennial grass paddocks that were rested during autumn and allowed to accumulate dry matter have been much more productive through winter and spring. Both the perennial and annual species in the paddock have benefited from the rest. In contrast, paddocks that were heavily grazed during the autumn have been sparser and less productive over the last few months.

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Evergreen Farming and WA Lucerne Growers join forces



Marcus Sounness and Erin Gorter sign a merger agreement

The chairs of Evergreen Farming and WA Lucerne Growers Erin Gorter and Marcus Sounness recently announced that they will join forces.

According to Erin and Marcus “The new body will continue to focus on perennial pastures and fodder shrubs to assist growers to be more sustainable.”

“Now we can both concentrate even more on broader pasture options which include lucerne and hopefully other perennial legumes.”

Evergreen major supporter Heritage Seeds is particularly pleased as it is a provider of both lucerne and sub tropical perennial pasture seed in Western Australia.

The joining of the two associations will be assisted by a recently announced ‘Caring for our Country’ Federal Government funded project. The project titled Perennial Pasture Companions also involves developing closer working arrangements with the Saltland Pastures Association (SPA).

This project will assist farmers wanting to grow perennial pastures. A series of farmer implemented demonstrations, field days and workshops will allow advisers and the farmer members of the associations to consider and discuss latest findings from research and case studies.

The recent Pastures for Profit Seminars were an opportunity to consider the option of sowing crops into perennial pastures in WA.

‘Perennial Pasture Companions’ to drive member value

Evergreen Farming together with Lucerne Growers and the Saltland Pastures Association submitted a joint application titled ‘Perennial Pasture Companions’ earlier this year to the Federal Government’s new ‘Caring for our Country’ program.

In late July we received word that ‘Perennial Pasture Companions’ was funded. Total dollars made it the highest funded project in Australia in this round. Hence the pressure is now on to ensure that we make the most of this much appreciated opportunity.

Evergreen plans to concentrate on driving member value. We will divide the state’s members into around ten geographically based focus groups. Each focus group will be targeted for a demonstration, a series of field days and selected on farm advice.

This approach will not only allow us to continue to disseminate information to all members on perennial pasture systems but also help us set up for future information sharing at your local level. Each group will be linked to a committee member and ideally be the source of future committee members.

‘Perennial Pasture Companions’ refers mainly to an important aim of the project; to investigate how the three groups can

work closer together. Obviously the project has already been highly effective in facilitating the merger of Evergreen and WALG. Joint project work and discussions with SPA are continuing. Shortly we will be sending all members a planned 32 page joint Evergreen SPA newsletter and we will run the Pastures for Profit workshops together.



Mixed sward: Glenice Batchelor (SPA), Marcus Sounness (WALG) and Erin Gorter (Evergreen) are all smiles after the announcement of the new project.

Perennials North & South “Demo Sites”

Philip Barrett-Lennard, Evergreen Farming, Ph: (08) 9475 0753.

Evergreen Farming has set up a number of on-farm demonstrations in 2008 as part of the NLP funded “Perennials North and South” project. These will be used to fine tune our current establishment and management packages for a range of perennial pasture species.

1) Lucerne sown with cover crops – Darkan

The major cost of establishing lucerne is the lost grazing during the year of establishment. Sowing lucerne under a cover crop reduces this opportunity cost as some income is received from the grain crop. The downside is that the cover crop can compete with the lucerne and reduce initial plant density. This trial has 5 rates of barley cover crop (from 0 to 80 kg/ha) in 3 configurations (barley sown in every row, barley sown in every second row, barley sown in every third row). It was sown in early June with a triple disc no-till drill following two knockdowns to achieve excellent weed control.

The adjoining paddock has been sown to lucerne with an oat cover crop that will be cut for hay. The oats were broadcast out first and the lucerne sown afterwards with an airseeder.

2) Ridge seeding to overcome waterlogging - Beaufort River

Temperate perennial grasses such as Tall Wheat Grass, Tall Fescue and Phalaris are usually sown on winter waterlogged and mildly saline valley floors throughout the Great Southern. A challenge is deciding when to sow, as these sites are often too wet and boggy to sow in Spring, and a late Autumn sowing can drown given a wet winter (like this year!). This winter drowning is exacerbated when knife points and press wheels are used, creating water harvesting furrows. This is good on well drained country, but no good in this country. So, instead, why not sow the seeds on the ridges between the furrows created by sowing points. DAFWA researcher Derk Bakker has sown a small trial at Rob Rex’s farm at Beaufort River exploring this concept.

A Boyup Brook farmer I recently visited is using this technique with canola by dropping the seed in front of Maxi points so the seed is pushed up onto a ridge. He says it makes a huge difference in alleviating temporary waterlogging.

3) Annual legumes sown into subtropical perennial grasses – Eneabba

A good subtropical perennial grass stand needs annual legumes to provide winter and spring feed and to fix atmospheric nitrogen. Most paddocks sown to subtropical perennial grasses have little or no annual legume component.

In this demonstration, a mixture of Charano and Margurita serradella, Urana subclover and Safeguard ryegrass was drilled in to an existing stand of Panic, Signal and Rhodes grass. A knockdown of 1 L/ha of SpraySeed was applied in early June to kill emerging annual weeds and to suppress the perennials. The day after the knockdown, the annual seed mix was drilled in to the perennials using a triple disc no-till air seeder with press wheels. Conditions were dry but some follow up rain was received soon after sowing. The paddock will be de-stocked in September and October to maximise the seed set of the Serradella.

A neighbouring farmer has used the alternative method of broadcasting serradella seed on to an existing subtropical perennial grass stand before the break of the season and using sheep to trample the seed in. This paddock will also be de-stocked in spring to maximise serradella seed production.

4) Pasture Cropping – Gillingarra

Pasture Cropping involves sowing an annual winter growing crop in to a summer active perennial pasture. In this demonstration, a paddock will be sown to Gatton Panic this spring and cropped over in future years with either lupins or cereals. The paddock is typical West Midlands sandplain that supports poor annual pastures and is marginal to crop due to the poor nutrient and water holding capacity. Gatton Panic was chosen as the perennial species due to its superior drought tolerance, feed quality and ability (hopefully) to withstand cropping herbicides. We do not expect to pasture crop the paddock every year, but opportunistically as the seasons allow. A triple disc no-till drill will sow the annual crops in future years, following a knockdown such as SpraySeed to control annual weeds.

5) Subtropical Perennial Grass establishment – Gillingarra

Over the last 5 to 10 years we have learnt a lot about establishing subtropical perennial grasses in the Northern Ag Region. Our list of “9 establishment must-do’s” is a result. In this demonstration we will further explore the furrow sowing “must-do” by comparing a number of different machines with different under-carriage set-ups. Some with discs, some with modified points, and hopefully a triple disc no-till drill.

We will also examine the use of a cereal cover crop sown down one row of the combine to produce a “hedge” to slow down the wind and hopefully reduce the risk of erosion over summer. The current dry conditions make wind erosion a real concern this summer.

No Kill Cropping - An Alternative Cropping Option

Bruce Maynard, Narromine, NSW, Ph: (02) 6889 0110.



Close up of oats growing amongst pasture plants, including weeds



Monitoring of crop in 2007

What is No Kill Cropping?

No Kill Cropping is the method of sowing crops into existing plant and litter cover without eliminating any other plants. It works on the complementary effects of diverse pastures rather than competition factors. It is a very low cost, flexible approach to crop growing that allows growers flexibility throughout the growing season. It is one of the only two cropping systems in the world (the other being Pasture Cropping) that work within grasslands rather than replacing grasslands to grow crops.

How does it work?

No Kill sows directly into the pasture or grassland with zero disturbance, no fallow period and uses livestock as nutrient recyclers.

There are 5 Principles:

1. Sowing is done dry
2. Coulter type implements are used (no tynes)
3. No herbicide or pesticides
4. No fertiliser
5. Good grazing management

Sowing is done dry to give the crop the advantage over germinating annual weeds along with keeping compaction effects to a minimum by travelling over the ground at its highest strength and that leads to low fuel usage.

Coulter type implements are used in order to cut through the existing plants and residue while disturbing as little as possible. The two main consequences of this are very low draft in dry soil and the ability to retain large amounts of residues on top of the soil.

No herbicides or pesticides are used so that no organisms are taken out of the system - either plant or animal. This leads to the maximum amount of biological activity throughout the year which then feeds the organisms that create topsoil.

No fertiliser is used for economic and ecological reasons. By not expending up-front cost with fertiliser application, risk is low and return on capital high while ecologically no simplification of the grassland occurs.

Good grazing management is critical to the long term with this method as it allows for the conditions that promote desirable plants while inhibiting the germination and growth of weeds.

Continued



Wide view of oat crop (note the height), almost covering the fence and Saltbush in the paddock

What are the results?

No Kill typically costs around 10% of a standard cropping approach while achieving similar or better whole year gross margins. This seems impossible until the extra grazing value is added in and the reduced yields subtracted. It is here that for many producers a problem arises. Are they willing to have less productivity? Many won't take that choice even though the margin is better. Productivity remains the yardstick of much of the industry.

Over 12 years No Kill has shown results in all but the worst of years with spectacular results in above average years. Some main advantages are the flexibility with livestock operations and the low ecological risk. This point may become even more important if the climate becomes more variable.

No Kill is now used not only for production purposes but also for rehabilitation of degraded areas as it puts organic matter on and below the soil surface, starting processes that repair the sites.

Is it suited to conditions in Western Australia?

The No Kill system is especially suited to areas that experience a definite seasonal rainfall band along with marginal moisture zones. By sowing much of the crop before the Autumn break the sowing operation is more spread and on the edges of the regular cropping districts sowing can be done with no risk to the existing groundcover.

With non-wetting soils this method offers good long term prospects as surface mulch layers are retained, thereby allowing organic matter to assist wetting up. With soils deficient in nutrients this approach keeps all residues not harvested and all the associations of soil microorganisms that come with that.

No Kill offers a very viable, ecologically and socially responsible system that can suit a wide range of producers in Western Australia - just as it has in the Eastern states.

If you would like to find out more please email:
angus@pasturecropping.com



Close up of wheat growing amongst pasture, including weeds

Case Study - Nick & Jane Trethowan, Kojonup

Future Farm Industries CRC

Summary



Name: Nick & Jane Trethowan

Location: Kojonup, Western Australia

Property size: 777 ha plus a further 700 ha leased

Mean annual rainfall : 510 mm (50-year average)

Soils: Heavy sandy loams

Enterprises: Merino sheep, canola, barley and oats



Lucerne has proved a best fit in Nick and Jane Trethowan's farming system, providing a vital source of green feed during summer for ewes and lambs, controlling rising water tables while fitting in nicely with their cropping rotation.

After a visit to Kojonup earlier in the year, the Future Farm Industries CRC recently caught up with fourth generation farmers, Nick and Jane Trethowan, to see how the season was progressing and get the latest lowdown on their lucerne.

"I remember during the summer of 2001, when the pasture paddocks were all dry feed, looking at the side of the road seeing green perennial weeds like phalaris, paspalum and veldt grass," Nick said.

"This inspired me to look at perennials as a potential source of green feed over summer.

We first tried sorghum after a heavy rainfall event during December 2002. We dived in with a knockdown herbicide and seeded the crop, grazing it twice before winter.

The following year we were ready to try our luck again, but our farm adviser suggested we look at lucerne as an option because of its perennality. He also felt it would be a better fit with our farming system, which already involved rotational grazing. So we grabbed it from there and ran with it.

Our adviser was right. Lucerne does fit in well with our system, mainly because we don't see rotational grazing as a barrier, like many more traditional livestock producers in our area. We have been rotationally grazing sheep for about 20 years.

Also, we were already growing canola and so equipped with most of the tools to manage small seeds, including the direct drill technology and the knowledge that bug and weed control is critical - if you can grow canola you can grow lucerne.

Exceeding expectations

Originally we didn't expect the lucerne to do much over summer unless we got out-of-season rainfall. We did expect it to extend the season — a few weeks before summer hit

and then a few weeks after it finished, but we didn't think it would do much without a rain event. However, it has never gone dormant — we keep rotationally grazing it and it keeps growing back. We have tried some other perennials, including an Evergreen subtropical perennial mix, and found it didn't work in our area — it was too wet and cold during winter.

I think we have learnt a lot through our failures. Even with the lucerne we've made every mistake you can make — from sowing on acid soil, to overgrazing and not controlling insects.

As a result we know a fair bit about what it can and can't take.

The key management tools are to ensure the soil pH is right (5 or above), get insect control and grazing management in the first and subsequent years. It is critical to allow the pasture to regrow between grazings to allow the stand to persist.

We often have graziers interested in how we manage our lucerne, but most are using set stocking and the rotational grazing is seen as a huge barrier to adoption.

Companion cropping

The other big thing for us now is companion cropping on top of the lucerne.

We did it for the first time, probably during 2004, putting some oats over lucerne as a fodder crop after hearing of others doing a similar thing.

At that stage, we had a heap of lucerne in and I felt it wouldn't be a drama if we stuffed it. But, it worked beautifully.

We grazed the oats that season, but it would have equalled at least an average crop if we had harvested.

Continued



Lucerne and chicory planted September 2003, companion cropped with canola in 2006 (1.3 t/ha), oats in 2007 (5.1 t/ha) and planted to Baudin Barley May 2008.

Two years ago we direct-drilled canola into a lucerne stand and that equalled our average yield of 1.3 t/ha.

This year gone, we achieved a 5 t/ha oat crop off the same paddock that was under canola last year and we are now seeding barley into the same paddock.

Multiple benefits

The benefits of lucerne are greater than just the increased pasture production and green feed during summer.

Paddocks we used to get bogged in every year, we haven't been bogged in since putting them under lucerne.

We currently have about 130 ha under lucerne but will hopefully increase that this year along with other perennials such as tall wheat grass and strawberry clover for our waterlogged saline country where lucerne is not an option.

In terms of lamb production lucerne gives the lambs a huge boost compared with the lambs without access to lucerne. I think the first year we ran lambs on lucerne they cut half a kilogram more wool per head.

We start lambing in early July through to the second week of August. The lucerne gives the lambs a great start after weaning.

We don't try to keep pure stands and I've noticed this year the lucerne paddocks are full of clover, so we'll get a good winter

pasture. We use winter active varieties, but they remain fairly dormant, so we want the clover and grass to be there.

When we decide to crop the lucerne we spray top during the previous spring using gramoxone and then rotational crop for two years. We then leave the lucerne out of crop for three years and the clovers regenerate.

The first paddock we put in during 2001 is still going strong except for a sandy seam with a low pH and it is mainly PL90 (winter active). We'll keep it going until it is too thin to use, but it is generally poor management that results in thinning.

We'll still have 10 plants per square metre and I consider that a good pasture. Some research suggests five plants per square metre will maintain a stable water balance."

This article has been provided by Future Farm Industries CRC.



Nick Trethowan getting up close and personal last summer with a companion cropped lucerne stand growing through the thick stubble of a 5 ton/ha oat crop.

EverGraze - Prime lamb production system update

Paul Sanford, DAFWA, Albany, Ph: (08) 9892 8475.

Most people have heard of EverGraze but for those that haven't it is a national research project developing perennial based systems that increase livestock profit while addressing natural resource management goals. In WA the project is demonstrating a prime lamb production system based entirely on perennials at Wellstead.

At the start of the project a whole farm model was used to simulate the potential increase in livestock production as a result of introducing perennials into the entire feed base. Now that we have 2 years worth of data it's interesting to compare the performance of the field demonstration to the targets set by simulation modeling (see table 1).

While drought reduced the benefits of perennials and substantially increased the amount of supplement fed in both 2006 and 2007, the field site produced more lamb for every 100 mm of rainfall than the simulated annual and perennial pasture systems. Unfortunately neither year was profitable due to the high cost of supplement and the inability to finish lambs due to lack of feed. Based on the number of lambs weaned, the field system has the potential to produce between 42 and 70 kg of lamb per 100 mm in an average season. However the key to how profitable the system could be is the amount of supplementary feed required.

So how have the pastures at the field site performed over the two years of drought? The performance of kikuyu in terms of yield, persistence and grazing days was extremely good in comparison to the other pastures. Summer-active tall fescue yielded well in 2006, however it failed to survive the dry summer of 2006/07 suggesting that this species is marginal in this environment. Surprisingly chicory did persist and while its yield was relatively low this species has potential on the south coast. Lucerne performed well and is suited to this environment however soil constraints at the site were the most likely cause of plant losses.



The paddock of Gatton Panic and Setaria (and Lovegrass!) is used to provide shelter for lambing ewes.

Given that a productive pasture should convert every mm of rainfall to at least 15 kg/ha of dry matter, only the kikuyu pasture was able to efficiently convert rainfall to dry matter over the two years of drought (see table 2). All of the remaining pastures either failed to persist or were inefficient.

While much of the state is enjoying a good season this year, rainfall at Wellstead has been below average. By the end of July the site had only received 173 mm compared to 216 mm and 174 mm at the same time in 2006 and 2007 respectively. Long term average rainfall to the end of July is 282 mm. Good opening rain in April was followed by reasonable pasture growth which slowed during May and June due to lack of rain and low temperatures. July recorded average rainfall however pasture growth has been low due to the cold, wet conditions. Currently all pastures are between a FOO of 300 and 550 kgDM/ha.

Stocking rate this year was set at 4.3 merino ewes per ha (approximately 8.4 DSE/ha) with the goal of achieving a high weaning percentage and finishing lambs at around 45 kg liveweight with minimal supplementary feed. Ewes were

Table 1. Comparative performance of field site with simulated annual and perennial pasture system.

	Rainfall (mm)	Stocking rate (DSE/ha)	Supplementary feed (kg/ha)	No. of lambs weaned per ha	Total lamb produced (kg/ha)	Total lamb produced per 100 mm (kg/ha/100 mm)
Simulated annual	500	8.5	279	4.6	161	32
Simulated perennial	500	12.0	95	7.3	260	52
Field site 2006	290	9.9	559	7.8	195	67
Field site 2007	333	6.0	627	4.7	197	60

Continued

joined on 12 February to Poll Dorset rams for 30 days and were scanned in May, returning a potential lambing of 156%. At the end of June we had fed out 203 kg of supplement per ha (almost 50 kg per ewe). Lambing commenced in July and while we don't have accurate figures to hand we look to be on target for a weaning of around 120%. Most lamb deaths have been the result of miss-mothering rather than hypothermia even though we have experienced some severe storms. During the first of these, the lambing ewes were effectively provided shelter in the setaria/panic paddock.

Hopefully this year we will receive good rains in both spring and summer, allowing us to demonstrate the potential value of perennials to prime lamb production.



EverGraze is funded by the Future Farm Industries CRC, Meat and Livestock Australia and Wool Innovation.

Table 2. Yield, basal cover & grazing days of different pasture types at the Wellstead EverGraze demonstration in 2006 & 2007.

	Year	Kikuyu	Tall Fescue	Lucerne	Chicory	Setaria panic	Annual pasture
Yield (kg/ha)	2006	5307	4753	3902	1235	1096	4020
Efficiency (kg/ha/mm)	2006	18	16	13	4	4	14
Yield (kg/ha)	2007	4551	1229	3261	3115	1657	1036
Efficiency (kg/ha/mm)	2007	14	4	10	9	5	3
Basal Cover (%)	2006	83.6	3.7	1.4	2.7	1.0	-
	2007	85.4	0.0	0.3	2.6	4.0	-
Grazing days	2006	97	86	34	28	10	-
	2007	94	0	21	43	9	-

2008 Pastures for Profit a Success

Thank you to everyone who helped make the 2008 Pastures for Profit workshops a success. About 200 people attended in total.

Evergreen Farming and WA Lucerne Growers would also like to thank this year's sponsors and supporters, including CSBP, Heritage Seeds, NACC, ERF, Elders, WR Carpenter Agriculture, NLP, South Coast NRM and DAFWA.

A major emphasis this year was alternative cropping systems, and our two keynote speakers, Colin Seis and Bruce Maynard, gave very thought provoking and challenging presentations.

Colin's talk on Pasture Cropping highlighted the benefits of having both crop and pasture in the one paddock at the same time. He sows mainly winter cereal crops (wheat, oats, cereal rye) in to summer active native perennial grasses. Interestingly, he said an initial yield decline can occur but once soil condition improves (after a few years with better perennials and better management), this soon disappears. This improving soil condition has also allowed him to slowly reduce fertiliser inputs.

Bruce's talk on No-Kill Cropping was more challenging to the croppers given the lack of weed control, but appealed to many



Even the cold couldn't but a damper on the discussion session at Esperance Pastures for Profit

of the graziers in the audience looking to bulk up perennial paddocks with winter cereals for stock feed. His 9 to 5 dry sowing approach using a ute looks to be almost as lazy as auto-steer! The carbon neutral battery operated ute (recharged using solar panels) he showed was quite possibly a look in to the future!

EverGraze Supporting Sites Overview

Paul Omodei, agVivo Pty Ltd, Manjimup, Ph: (08) 9777 2980.

The EverGraze project in WA has one major research site at Wellstead (see page 10) plus a number of Supporting Sites along the South Coast and in the Warren Catchment (Kojonup to Manjimup). These supporting sites are paddock scale examples of perennial pastures being monitored for production and persistence. The information below is an introduction to the supporting sites in the Warren Catchment. Detailed stocking rate and persistence data will appear in future newsletters.

1) Erin & Thys Gorter

Location: South West corner of Kojonup Shire

Enterprise: Mixed farming - grain & cross bred lambs

Species Selection: Lucerne & Chicory

Sowing time: 14th September 2006

Area sown: 33 ha paddock

Soil type: Gravelly loam; sand over clay

Aim of planting: For finishing prime lambs as a lower-cost alternative to feedlot and backgrounding lambs prior to feedlot entry.

Results so far: Good production and grazes throughout summer and autumn months. Used for finishing lambs during summer, lambing ewes in early winter and bought in ewes in mid winter.

Lambs were weighed when entering the feedlot from the perennial paddock as well as when leaving the feedlot. Some were finishing faster after coming off the chicory and lucerne.

Management Issues:

Persistence - Having mixed perennial pasture species makes grazing management difficult at times due to both species growing at different rates and requiring different management. In time, one species may become more dominant than the other so the balance of the two species in the sward changes.

In one site, lucerne plants had noticeably been selectively grazed much harder by stock than chicory which had hardly been grazed at all. This could lead to some persistent issues with lucerne at this site down the track.

Timing of Sprays - Control of broad leaf weeds and insect pests in a stand of chicory and/or lucerne such as this is very important. This site had some broad leaf weed problems (namely capeweed and geranium) and quite a bit of pressure from RLEM when sampled in autumn. The problem was getting onto the paddock early enough to spray as the Gorters were waiting for spraying contractors. This meant that by the



Gorter's paddock during May, following break of season. Broad leaf weeds evident in space between perennial plants, good production following break of season.

time the spraying could be done, the weeds were already too large and the pest pressure had increased.

To control weeds such as geranium, a selective grass herbicide such as Verdict will take out geranium and also grasses. In this case the stand was not very dense, so taking out grasses would have left a lot of bare ground which risked further weed colonisation and less production.

The decision was taken to use 24-D-amine to control both geranium and capeweed.

2) Daniel and Narelle Simpson

Location: West of Kojonup

Enterprise: Mixed farming - grain, wool and cattle

Species Selection: Kikuyu

Sowing time: September 2007

Area sown: 20 ha

Soil type: Loamy sand, gravelly sand.

Aim of planting: Extra feed during summer months and to take the pressure off hand feeding.

Results so far: Results so far have been quite good at this site. The site was used for weaner sheep to graze twice in summer and has been continually stocked with wethers since the break of the season. The pasture has stood up well and received minimal inputs. Wethers have not required any hand feeding since autumn.

Management Issues:

Ground cover - This site is noticeable because it has taken some time for the runners to spread and to achieve a good

Continued

level of ground cover. Plant density is not an issue, it was sown at a higher than normal rate (5 kg/ha as opposed to 2 kg/ha). This may be affecting competition and the ability of the plants to spread into the gaps and cover the inter row space. Daniel does not see this as a problem as the plant density outweighed the lack of feed in the inter rows and winter annuals have filled the space and are providing the bulk of the feed while the kikuyu is dormant.

3) Jim, Lorraine and Ben Dorrell

Location: East of Manjimup

Enterprise: Mixed farming - cattle, sheep and horticulture

Species Selection: Kikuyu

Sowing time: 6th October 2007

Area sown: 12 ha

Soil type: Gravelly sand to gravelly loam

Aim of planting: A low lying sandy paddock that was nearly always semi-moist, well suited to kikuyu. Soil was naturally a bit acidic.

Results so far: Production at this site has been phenomenal. It was grazed within ten weeks of sowing and, to date, the main trouble has been keeping stock up to it.

Management Issues:

Tight Grazing - the main trouble with this stand has been getting stock to keep up with the amount of feed. This is a particular problem when grazing kikuyu with cattle (as in this case) because they are not able to eat it down far enough. If anything, this site requires heavier grazing.

Broad leaf weeds - Having previously been a semi-moist, predominantly unproductive annual pasture, there were some residual broad leaf weeds that are typically associated with low-lying wet paddocks such as this. As far as establishment goes, this does not appear to have been hindered by the weeds. Site monitoring shows plant numbers and density continuing to increase. It is anticipated that the weed populations will decline as the kikuyu becomes more established so in this case there has not been the need to spray. In most cases, particularly drier sites, an autumn broad leaf weed spray would be recommended.

4) John and Danielle Mottram

Location: South East of Manjimup

Enterprise: Cattle and Sheep

Species Selection: Winter Active Tall Fescue



Dorrell's kikuyu during May (good feed levels following autumn break).

Sowing time: June 2007

Area sown: 12 ha

Soil type: Karri loam; Deep River Loam

Aim of planting: Increase winter and spring production, extend the growing season in autumn and end of spring.

Results so far: Initial production estimates have been quite encouraging from this site. It was grazed three times in 2007, its establishment year, and reported three grazing events for the first half of 2008. Rotational grazing has been the key to growth rates, allowing rest periods so the plants continue to grow. Pasture is left to reach at least 2,500 kg/ha dry matter per ha and not grazed too heavily, down to 1,000 kg/ha DM.

Management Issues:

Broad leaf weed control - This has been an issue at this site in the establishment year and this year. The problem with broad leaf weeds (mostly capeweed) not being controlled early has been competition with newly recruited perennial seedlings. Weeds have taken space away from seedling recruits which, in turn, will reduce the plant density of the perennial species.

Variable establishment - Where there was uneven establishment in the stand it is evident that there is uneven growth in some sections of the pasture. This has led to uneven grazing as the stock (cattle) have over grazed the poorer growth areas and under grazed the high growth areas. In the longer term, this may affect persistence of the perennial species in the poorer growth areas. Some unevenness may be avoided by getting stock on to the pasture to graze earlier for the first graze after the break. This should even up the growth a bit going into winter.

Rhodes turns deep sand around

Alison Cooke, Evergreen Grain & Graze project officer, Ph: (08) 9952 5030.



Annual pastures consistently provide 70 to 80 per cent of the annual grazing on the Panizza's two properties.

Aubrey Panizza and his brother Phillip have transformed the sandiest soils on their Badgingarra properties by planting them to Rhodes grass.

The brothers were founding members of Evergreen Farming and have been sowing perennial grasses for over 15 years.

Working strictly to soil type, Aubrey has established 503 ha to Rhodes and signal grass and realigned fences.

He claims that these perennial grasses now support stocking rates of 9 DSE/ha during winter and spring.

“In the past, these sandy areas would have been brome grass and struggled to support 0.25 DSE/ha during the growing season,” he says.

The Panizza family run a 2,400 ha sheep operation on two properties, Yerramullah Park and Stone End, 13 km west of Badgingarra.

Soils are sandy with gravel ridges and annual rainfall is 600 mm.

Located 40 km from the coast, frost is seldom an issue and perennial grasses grow actively during the winter months.

All pastures on the Panizza property are fertilized with 70 kg/ha of Coastal Super, however this rate was cut back this year given the spike in fertilizer prices.

Devoted to sheep and the wool industry, Aubrey runs 5,200 ewes – 70 % of ewes are crossed to AMS rams

and the balance, terminal sires. The long term plan is to run more wethers and fewer prime lambs.

The Panizza family were one of 13 demonstration farmers in the Northern Agricultural Region involved in the Grain & Graze project, which compared production from perennial and annual pastures with crop stubbles over a three year period.

In this case, three fodder types (annual pasture, Rhodes grass and oat stubble) provide complementary grazing at crucial times of the year.

The three year study highlighted the value of the annual pastures which consistently provided 70 to 80 percent of the annual grazing and supported annual stocking rates in excess of 6 DSE/ha, with the peak stocking rates achieved during winter and spring.

The area established to Rhodes and signal grass, which was the sandiest country on the farms, covers 24 percent of the farms' arable area.

In Aubrey's experience, grazing the perennial grasses during the summer caused the plant density to decline, instead he grazes the grasses from the season break to November.

In the event of summer rainfall, the perennial grasses are grazed opportunistically.

In 2006 and 2007 these perennial grasses supported 14 percent and 22 percent of the farms' total grazing and stocking rates of 9.1 DSE/ha were achieved on the Rhodes grass pasture in the winter and spring of 2007.

This data backs up Aubrey's observations that the stands of perennial grasses continue to thicken up over time.

Because the perennial grasses respond instantly to the opening rains of the season, the Panizza family are able to defer grazing annual pastures and save on supplementary feed.

Table 1. Panizza grazing results by fodder type from August 2005 to April 2008

	Fodder	DSE/ha	DSE grazing days	Area (ha)	% area	% of grazing
2005	Annual pasture	6.08	1,489,553	1346	67	82
	Rhodes grass mix	1.94	148,279	420	21	8
	Oat stubble	4.36	185,529	234	12	10
2006	Annual pasture	7.49	3,545,454	1297	65	79
	Rhodes grass mix	3.70	616,738	457	23	14
	Oat stubble	3.61	324,420	246	12	7
2007	Annual pasture	6.46	3,058,961	1298	65	72
	Rhodes grass mix	5.45	940,234	473	24	22
	Oat stubble	3.24	270,697	229	11	6

Continued

Stock on the perennial grasses do not get the 1 kg of grain fed weekly to those sheep on annual pastures.

Aubrey crops about 12 percent of his property annually to a mix of oats and lupins and this stubble is a valuable source of fodder during summer and autumn, which complements the grazing available on the perennial grasses.

High stocking rates of 13.2 DSE/ha were achieved on the stubble in autumn 2006 as the sheep grazed an oat crop as standing fodder.

Some 74 mm of rain in December 2007, with a further 30 mm in February 2008 enabled the Panizza family to make use of their perennial grasses from March 1, saving on grain and hay.



Table 2. Seasonal stocking rate by pasture type, measured in DSE/ha

Pasture	2005		2006				2007			
	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer
Annual volunteer	8.14	4.16	4.72	8.40	10.67	6.58	5.47	7.78	8.09	4.85
Rhodes grass mix	3.38	0.54	0.89	7.80	5.16	1.15	1.87	9.10	9.14	1.97
Oat stubble	0	8.81	13.19	0	0	1.46	8.28	0	0	4.85

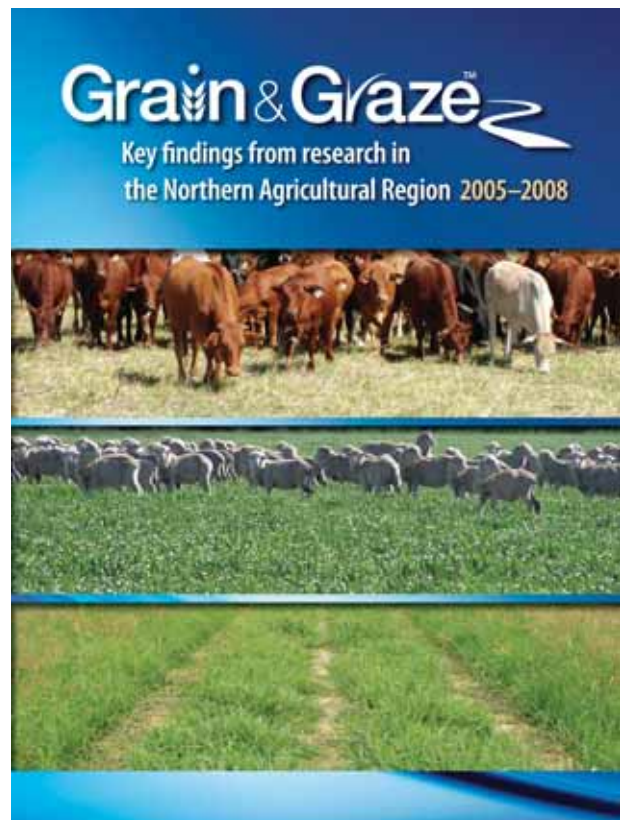
Key Findings - Grain & Graze

The results from 4 years of research and on-farm monitoring by the Grain and Graze project in the Northern Agricultural Region have just been released in a "Key Findings" booklet. The 130 page booklet contains Discussion Papers, Research Reports, Case Studies and Economic Analyses. Detailed information on stocking rate by pasture type by season is also presented for 13 Demonstration Farms. In addition, an audio CD has been produced featuring interviews with farmers from the NAR discussing how and why they adopted perennial pastures.

Evergreen members in the NAR will soon be mailed a copy of this booklet and CD. Non-NAR farmers can request a copy by ringing Charlene on 08 9475 0753.

Talking... Perennial Pastures

Listen to growers from across WA's Northern Agricultural Region discuss their experience with perennial pastures



Lucerne grazing management for sheep and cattle

Tom Bailey, WA Lucerne Growers, Katanning, Ph: (08) 9821 3263.



Lucerne is a perennial pasture that provides valuable green feed during the traditional autumn feed gap. It is highly digestible (65-75%) with good energy levels of 8-11 MJ/kg dry matter. It also provides a reliable source of 15-25% crude protein which is above the protein requirements (12-14%) for optimal growth of young animals. This article explains how to manage lucerne stands for best productivity and longevity under sheep and cattle grazing pressure.

Good grazing management techniques guarantee optimum production from lucerne stands. Lucerne plants develop a 'crown' that stores energy for plant growth and from which buds or shoots form. Overgrazing happens when this new growth from the crown is repeatedly eaten out, exhausting plants as they try to photosynthesize and return carbohydrate reserves to the crown. Thus, when planning a grazing program, it is recommended to use a high stocking rate for a short period of time so that any regrowth is not prematurely grazed. This period can range from one to three weeks depending on growing conditions and stocking rate. The high grazing pressure will force animals to be less selective thus removing stems as well as leaves. It is also suggested that after grazing, a stand is given sufficient recovery time, usually four to six weeks during the growing season.

Whichever system you use, graze at a high stocking rate for a short time.

When the shoots flower, growth slows down, and lucernes' nutritional value begins to decline. If mature shoots are not removed, growth of new shoots slows, and feed quality declines with a greater risk of leaf drop. Consequently, it is

generally acceptable to allow grazing at 10% flowering. In spring and autumn where day length and temperature change, flowering is inhibited, and the indicator for time of grazing should therefore be when the secondary growth reaches two to five centimetre in height.

Grazing the established lucerne stand

For best results, lucerne should be rotationally grazed if it is to persist in a grazing system. The grazing program adopted depends on the number of lucerne paddocks, stock numbers and whether sheep or cattle are grazing. Make sure that you adjust stocking rates so that dry matter is reduced to about 300-400 kg/ha at the end of each grazing period, or that plants are grazed to a height of about one to two centimetres. Sheep require more intensive management than cattle. Sheep graze much closer to the ground and can damage crowns and regrowth if their grazing habits are not controlled. Cattle seldom remove all leaves, and so are less likely to damage crowns.

Graze at 10% flowering or when the secondary growth reaches two to five centimetres.

For sheep, the ideal grazing program ranges from a three-paddock system (grazed for three weeks then rested for six weeks), to a six-paddock system (grazed for one week then rested for five weeks).

For cattle, the grazing regime can be as simple as a four week grazing period followed by four weeks rest, or a four week grazing period followed by eight weeks rest. This simpler system is adequate, for several reasons. Firstly, cattle do not



A grazed lucerne stand in the Woogenellup area



An ungrazed lucerne stand in the Mt Barker region

Continued

graze lucerne as closely as sheep so they can stay in a paddock for longer without risk of damaging the plants. Secondly, lucerne paddocks can be spelled for longer, from six to nine weeks, when grazing cattle to compensate for longer grazing periods and because cattle tend to do better on the more mature lucerne. Finally, the economics of grazing cattle on lucerne dictate fewer paddocks, since the costs of fencing and watering for cattle are higher.

Grazing in the year of establishment

Grazing in the first year of establishment must be managed to allow a crown with adequate buds to develop. During the year, primary growth will draw energy from the crown to produce stems and leaves. However, when secondary growth occurs, energy from the leaves replenishes the crown providing the plant with reserves if regrowth is required. Young lucerne stands of less than 12 months are particularly vulnerable to grazing. The young plants are still establishing, sending down extensive taproots and developing strong crowns. Grazing of the top growth interrupts this process and deprives young plants of food and they can easily die. Grazing during a

lucerne establishment year should therefore take place only when the lucerne stand starts flowering. When flowering begins, new shoots will sprout from the crown of the plant. As mentioned above, your indicator to start grazing during the spring to autumn period should be when secondary growth reaches two to five centimetres tall.

By far the biggest health issue of livestock grazing on lucerne is bloat; it is a bigger issue for cattle than for sheep. This is most likely to happen on pure lucerne stands, especially during spring. Red gut is a minor problem and has only occurred in isolated cases. Both bloating and red gut can be avoided by providing adequate quantities of roughage (hay) in the paddock or the gate can be left open to adjacent stubble paddocks.

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Animal health issues from grazing Lucerne

Tom Bailey, WA Lucerne Growers, Katanning, Ph: (08) 9821 3263.



Bloat

Bloat is rarely reported in sheep. However death caused by bloat is the biggest single health issue for cattle grazing lucerne. This is most likely to occur on pure lucerne stands, especially during spring. Some animals are more susceptible than others.

Management:

- Provide a constant supply of cereal or meadow hay
- Set stock during high risk periods instead of rotational grazing.
- Only graze cattle on lucerne in summer and autumn, use sheep during winter and spring.
- Ensure cattle are not hungry when they enter new lucerne pasture.
- Avoid grazing young succulent lucerne. Flowering or more mature stands have less risk.

Enterotoxaemia (pulpy kidney)

May cause animal losses on lucerne as on many other high quality feeds or grain supplements.

Management:

Both sheep and cattle should be vaccinated

Pizzle rot

Wethers tend to get more pizzle rot when grazed on lucerne, because of the higher nitrogen content in the urine, compared to normal annual pastures.

Management:

Reduce the protein content of the feed, supply roughage.

Red Gut

Redgut, is a condition that occurs predominantly in sheep who have unrestricted access to, and therefore gorge on, lush leguminous or leguminous mix pastures. Whilst the first reported cases were recorded from sheep grazing lucerne the condition can also occur in sheep grazing subterranean clover pastures.

Sheep who suffer this condition die within 3-6 hours from an intestinal mass that twists, blocking blood vessels which then leads to shock and subsequent death. To identify suspected cases of redgut a post mortem examination should be conducted straight after the animal has died.

Post-mortem examination:

Always open up a suspect carcass on its back. Look for the following:

- Intestinal position twisted 180-360° in a clockwise rotation when viewed from the top of the intestinal mass.
- Colour of the displaced intestine is bright red; in recently deceased animals the colour is dark red.
- The area of colour change begins in the small intestine, usually 100 to 120 cm down from the stomach, and then continues through to the end of the colon.
- The heart may have subendocardial bleeding in the left ventricle.

Management:

Deaths can occur at any stage of the growth of lucerne, however it appears that actively growing stands and stands that are immature pose the greatest risk to the grazing animal. Farmers have controlled Redgut occurrence by providing roughage in the form of hay at times of the year considered most risky to stock and if pastures are particularly lush.

A cause for concern?

Redgut is a condition for farmers to be aware of but not concerned about. There have been no confirmed cases in WA in the last eight years however, some farmers in Gnowangerup and Borden have suspected Redgut when lambs died after being weaned onto lucerne. However, if farmers understand what predisposes stock to Redgut then most losses will be avoidable. The provision of roughage such as hay to young sheep who are being grazed, particularly for the first time, on young actively growing lucerne will be the most cost effective method of control.

This article has been extracted from Farmnote No 27/2003 Grazing sheep and cattle on dryland lucerne and a journal paper written by RC.Gumbrell. New Zealand Veterinary Journal V45:217-221, 1997



Lambs grazing a mix of lucerne and oats. They were moved onto this paddock after deaths on pure lucerne paddocks.

Some facts about lucerne from Heritage Seeds

- All Lucerne varieties grow during summer.
- Lucerne dormancy rating (1-10) describes winter growth.
- Winter dormancy does not automatically mean persistence.

All Lucerne varieties grow during summer providing there is enough soil moisture for active growth. Winter dormancy or activity is a term used to describe how tall a particular lucerne variety grows in winter.

The major differences between highly winter active and winter dormant lucernes are; how early the dormant type shuts down coming into winter, seedling vigour, speed of re-growth, leaf: stem ratio, time to maturity, plant height, crown structure and stand longevity (see Table 1).

It is misleading to think that just because a lucerne variety is a dormant type that it will persist longer than a winter active variety. There are big differences between the persistence of varieties within the same group, especially amongst highly winter active lucernes.

Factors such as pest and disease resistance, crown structure and where and for what purpose the variety was bred will impact on persistence. Some highly winter active lucernes display poor

persistence under grazing because they have been produced from imported varieties or breeding lines which are developed under short-term cut and carry systems, with no exposure to longer term grazing.

Grazing is such an integral part of Australian farming systems that for the last 20 years Lucerne breeders in Australia have been developing highly winter active lucernes to persist longer under grazing. Heritage Seeds markets highly winter active lucerne varieties that have been developed in Australia by SARDI under intense grazing, for broad Australian adaptation.

Table 1: Differences in plant characteristics typical to lucerne dormancies.

	Winter Dormant	Winter Active	Highly Winter Active
Dormancy Rating	3-5	6-7	8-10
Crown type	Prostrate	Medium	Erect
% total growth through winter	5-10 %	10-15 %	15-25 %
Seedling vigour	Moderate	Good	High
Cutting interval (Days)	30-35	28-32	25-28
Relative persistence (yrs)	5-8	4-6	3-5

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Resolute Fescue at Narrikup

Kelvin Ridgeway of Narrikup sowed this paddock to Resolute winter active Tall Fescue in August 2005. It is rotationally grazed, mainly with cattle, but also with sheep. This paddock is being monitored as part of the EverGraze Supporting Sites project so further information including stocking rates will be available in coming years. Photo 20 May 08 courtesy Darren Michael, South Coast EverGraze project.



Spider electric fencing system

Michael Harcourt-Smith demonstrates his portable "Spider" electric fencing system at a recent perennial pastures field day in Williams. This is similar to the "Rappa" system as it can un-wind and re-wind 3 hot wires in quick time. Insulated tread-in posts are pushed in without having to get off the bike. It comes from KiwiTech, the developers of the Techno Grazing system in New Zealand. www.kiwitech.co.nz. Photo courtesy Ned Crossley, DAFWA, Narrogin.



Puna Chicory at Esperance

This is a long term Puna Chicory paddock that has featured in this Newsletter a few times before. It was sown by Rob West of Esperance back in 2002 on loamy soil. Rob uses it to finish prime lambs after they have been backgrounded on subtropical perennial grasses. He uses very strict rotational grazing to maintain a high plant density. This photo taken 6 June 08 when things were really tough in Esperance. Photo courtesy Darren Michael, South Coast EverGraze project.



Temperate Grasses at Beaufort River

Rob and Caroline Rex have been sowing perennial pastures on their valley floor country at Beaufort River over the last 5 or so years. As the years go by, they are getting better and better results as they improve both species selection and ground preparation. This excellent mixed stand of Phalaris, Tall Fescue, Cocksfoot and Tall Wheat Grass was sown in late July last year. Interestingly, they are using liquid calcium injected in to the seed bed and sprayed on to the soil surface to improve establishment. Photo 21 Aug 08.