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CQ BEEF

Better Economic and Environmental Futures

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Good seasonal conditions a cause for optimism

Tim McRae
Economist MLA , Sydney

One of the best starts to a year in many decades has provided the impetus for stronger cattle prices in the first half of 2010, with producers across the NT, Queensland and south east Australia finally seeing the benefits of widespread rain. While some regions continue to face tough conditions, especially across WA, the 2010 season is expected to provide the momentum for national herd and production growth in coming years.

The much better season in 2010 has been the main driver behind higher cattle prices in 2010, which has largely overshadowed the ongoing tough export environment. Sluggish economic conditions and financial uncertainty in key markets, along with the high A$, continue to weigh upon the market and constrain beef export returns.

With the significant improvement in seasonal conditions expected to underpin expansion, the national cattle herd is forecast to grow 1.5% in 2010–11 and reach 29.7 million head by 2015, 6% higher than in 2010. While cattle numbers in Queensland were estimated to be steady in the year to June 2010, the extent of the better season across most regions will have seen many producers taking steps to start rebuilding herds. The Queensland cattle herd is anticipated to exceed 13.1 million head by 2015, provided seasonal conditions and market conditions are favourable from 2011 onwards.

Total beef and veal production in 2010 is forecast to be back 0.6% on the previous year, as a jump in weights largely offset a fall in slaughter.

Many of the positives for the Australian cattle and beef industry that were outlined at the start of the year will continue to underpin prices for the remainder of 2010. This includes the better season across the eastern half of Australia, improving economic conditions in export markets and a robust domestic market.

However, there have also been some developments of concern to the industry, most notably fears of a double dip recession in key markets and restrictions on live cattle import permits and weight restriction for cattle to Indonesia.

While the economic recovery is anticipated to continue in Japan and the US in the second half of 2010 and into 2011, questions still hover over the ability of these economies to rekindle and sustain growth in consumer spending, especially with unemployment, debt and weak consumer confidence remaining. Indeed, for a sustained recovery in beef prices, the US and Japanese consumer must return to eating beef and be able to absorb these higher prices.

With the A$ assumed to range between 85US¢ and 95US¢ for the remainder of 2010, Australian exporters are again expected to face a difficult period.

While demand for Australian beef in export markets will continue to face hurdles in the second half of 2010, the domestic market is likely to offer a viable alternative, with positive growth and high consumer confidence. The domestic market's share of total production is expected to increase significantly in 2010, with total consumption forecast to jump 3.4%, to 760,000 tonnes cwt.

One of the features in recent years, besides the recession led fall in global consumer demand, has been declining cattle herds in the major beef trading countries of North America, South America, Oceania and Europe. Additionally, major importers, such as the US and Japan, have reported beef stocks at very low levels, which will heighten export demand once consumer demand recovers. This should help underpin higher global beef prices throughout 2011 and beyond.

Over the medium term, improved cattle returns will also influence herd expansion, as demand for beef recovers in North Asia, North America and Europe, the A$ eases from recent highs and the competitive position of the US in global markets stabilises.

For the live export arena, the outlook for the coming

Editorial

MLA Economist Tim McRae was a speaker at the Middlemount groups marketing day in July. Tim fielded a barrage of questions at Middlemount and with the release of the MLAs 2010 Cattle Industry Projections mid-year update we thought it important to cover some of this information in the newsletter. Thanks for contributing Tim. Members from the Middlemount CQ *BEEF* group have also recently attended a Nutrition Edge course. We feature the Black family from the Middlemount group as this issue's Producer Profile.

New Billaboo facilitator Prue Becker has summarised some of the information shared at the Billaboo Breeder Reproductive Performance field day for this issue. The Billaboo group have since held a meeting where results of the Reproduction Producer Demonstration Site were shared and discussed. The newsletter also features an article on moving herds into control mating.

Last year central Queensland Beef producers were invited to participate in a series of discussions about their experiences with Buffel grass rundown. Gavin Peck has compiled a summary of these discussions; Gavin is currently working on the review of productivity decline in sown grass pastures. Stuart Buck has provided and update on the Leucaena Establishment Producer Demonstration Site run with the Biloela group.

As it's bull buying season we've asked DEEDI staffer Peggy Rohan to write about using Estimated Breeding Values to make more informed bull purchases. Peggy previously worked for Breedplan and has used this experience along with input from DEEDI breeding and genetics specialist John Bertram to write the article.

Well done to all who have completed their *ProfitProbes*.

I hope you enjoy the read.

Byrony Daniels, CQ *BEEF editor*

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five years is uncertain, being highly reliant upon demand from Indonesia. While access to Indonesian import permits is likely to be the main impediment to trade, it will also take some time for the production systems to adjust to the 350 kg limit for cattle to Indonesia.

Expectations as to how live export orientated producers, and indeed the market, will deal with the limitations on marketing heavy cattle differ. One possibility is that producers will retain cows if seasonal conditions remain favourable, which will boost numbers in coming years. Increased exports to other markets are also likely, with the timing of the recent resumption of trade to Egypt relieving some supply pressures.

The Middle East will become an increasingly important market for Australian beef and cattle over the medium term, although the competitiveness against other proteins, particularly beef from South America, will be crucial to overall demand.

Valued exposure: Using photographs to monitor land condition

Joe O'Reagain
FBA Biloela

Key points

- Land in good condition is better able to respond to rain and will produce higher forage yields and better quality feed.
- Monitoring land condition ensures you can identify problems.
- Photo sites provide a quick easy monitoring system and an excellent visual record.

The excellent falls received across much of central Queensland have shown how critical land condition is to forage production when the rains arrive. The capacity of grazing land to respond to rainfall is a key determinant of forage production and overall carrying capacity and underscores the importance of keeping an eye on the condition of your country.

This article revisits the ABCD land condition framework described by Gina Mace in the July 2009 CQ *BEEF* newsletter ('Grazing Land Management Condition Assessments – It's as easy as ABCD') and provides a guide to using photographs to monitor land condition over the long term.

Importance of land condition

For land to produce its maximal amount of useful forage, it must be functioning well as an ecosystem – that is, capturing the maximum amount of solar energy and converting it to plant growth, efficiently cycling nutrients and maximising available soil moisture available to plants. If grazing land is performing all of these functions efficiently, it will achieve its forage potential in response to rainfall.

Therefore, land condition can be defined as 'the capacity of land to respond to rainfall to produce useful forage'.

Land condition can be classified as being in either A, B, C or D condition using the following indicators:

- Density, coverage and health of 3P (perennial, palatable and productive) grasses
- Ground cover levels
- Soil surface condition
- Evidence of erosion
- Presence of weeds
- Woodland condition.

Pastures that are in A or 'good' condition will generally have a strong presence of 3P pasture species, good levels of ground cover and organic matter, a stable soil surface, few weeds and undesirable grasses and will not be in strong competition with trees for light and moisture.

Conversely, pastures that are in C or D ('poor' or 'very poor') condition have few desirable species, low ground cover, signs of soil instability and may also play host to weeds and woodland thickening.

Maintaining a strong presence of healthy 3P grasses is the cornerstone of optimising the health of your country and the quality and quantity of feed grown each season. The production benefits of having a high proportion of 3P species in your pasture are:

- Soil is kept in place when the first storms arrive and rainfall infiltration is maximised.
- They respond faster to rain than annuals as established plants regrow from tussocks, while annuals grow from seed.
- They grow a far greater bulk of palatable material than annuals and have a longer growing period. This results in a higher carrying capacity and live weight gains.
- Healthy tussocks limit the ability of weeds and undesirable grasses to establish.
- The ground cover tussocks provide minimizes evaporation and protects soil structure and stability by limiting erosion and compaction.

Maintaining land condition

As 3P pasture species are a key to good land condition, maintaining their health and density is paramount. Management can promote their presence by:

- Implementing rotational spelling at the beginning of the growing season, for long enough to permit seed set and drop.
- Avoiding prolonged periods of grazing during the active growth period.
- Maintaining ground cover above 50%
- Preserving the growing points on tussocks.

Benefits of monitoring land condition

Land degradation is usually a very slow process and if not recognised early can be very costly in the long term in terms of lost production. Considerable time, money and effort are required to restore it and in more fragile land types, this may not be economically feasible.

By monitoring land condition, problem areas can be identified early and appropriate action taken. Land condition assessment will also aid in more accurate assessment of long term carrying capacities and short term stocking rates.

Photo monitoring

Setting up photo sites is an excellent way to keep track of the condition of your country as they provide a powerful visual record.

What you'll need Star pickets, picket caps (or 50 mm PVC pipe with wire) and camera.

Site selection When selecting sites take into account the layout and condition of the paddock, including land types and problem areas. In large paddocks it may be best to have one site within each land type to account for preferential grazing effects. Alternative approaches are to locate the site on the dominant landtype or the one that is at most risk. Either way, ensure the site that you select is representative of the condition of the overall paddock or land type in question. Also be aware of the sites proximity to water, fences and supplementation areas as these will have different grazing and traffic effects when compared to the rest of the paddock.

When you have selected your site, position two pickets ten metres apart in a line running north-south. It is a good idea to record the location of your sites with a GPS unit so they can be marked on your property map.

If you do not wish to have pickets left at the site, dig a hole and insert some bore casing or poly pipe – that way you can easily stand a picket up when the time comes to take a photo. It's a good idea however in this case to have a marker at your site such as a painted plough disc or stone to help you relocate your sites when you revisit them.

Taking photographs

The best time for taking photographs is on a clear day between 9am and 3pm. Always take photographs facing south and aim to take your photographs at the same time (month) every year. You may wish to take photos at the end of the growing season and then again at the end of the dry. Most importantly, be consistent – this way photos will be more comparable when viewed in sequence over a period of years.

Take two photos at each site, a trayback and a landscape. The trayback photo will look into the pasture and give a clearer image of ground cover levels, species present and erosion, whilst the landscape photo will provide a broader picture of the overall condition of the area.

The trayback photo

Park your vehicle beside the photo site post and stand on the back with the camera so you are looking south.

Position the base of the post (numbered 1 in figure 1) in the middle of the viewfinder, focus on the pasture, make sure the image is level and take the picture.

An alternative to standing on the back of a ute is to stand on a four-wheeler, drum or step ladder.

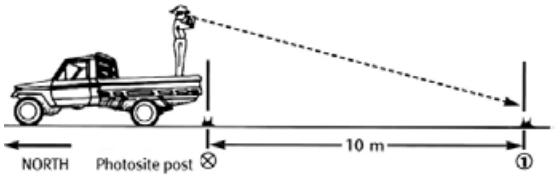


Figure 1. The trayback photo

The landscape photo

Stand on the ground next to the photo site post (don't get it in the photo) and line it up with post 1 (see figure 2). Position the top of post 1 in the top of the viewfinder, focus on infinity, make sure the image is level and take the photo.

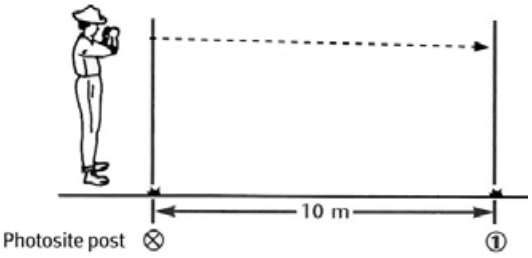


Figure 2. The landscape photo

Rolleston CQ BEEF member Matthew Peart sets up a photo monitoring site as part of a PDS investigating legume establishment

Stocktake workshops are an excellent opportunity to learn more about assessing land condition and accurately calculating pasture growth versus animal demand. The Fitzroy Basin Association is holding a Stocktake workshop in Emerald on 5 October. Further workshops will be scheduled for early 2011. For enquiries contact Joe O'Reagain – Phone: 4992 5417 Mobile: 0427 572 200 Email: joe.oreagain@fba.org.au

Landcruiser versus Datsun – know what you're buying

Peggy Rohan
DEEDI, Emerald

Key points

- Bulls have a significant long-term impact on the genetics of your herd and therefore your profitability.
- EBVs are a handy tool to be used in conjunction with visual assessment when purchasing a bull.
- Use EBVs to target traits that you want to improve in your herd in order to meet your breeding objective.
- Use EBVs to predict the performance of a bull's progeny.

Buying a new bull is similar to buying a car. If you are in the market for a Landcruiser, you wouldn't want to pay your money only to find that hiding under the cruiser exterior is a Datsun 120Y engine. When buying a bull, you cannot open the bonnet to see what is inside. A visual assessment will reveal essential structural information, but for the genetic make-up, the best tool a bull buyer has available is Estimated Breeding Values (EBVs).

People often place a high value on selecting their best heifers as replacement breeding stock. These heifers have the potential to inject their genetic influence into the herd by producing one calf per year over their breeding lifetime, which may be 8–10 years. Where real genetic progress is made though, is in bull selection. If one bull works for say four seasons, then he has the potential to sire 4 x 40 calves (if the bull percentage is 2.5%) over his lifetime. Those calves will inherit 50% of their genes from their sire; the heifers that you keep for replacements will be in your herd for up to 12 years. Therefore the decision of which bull to buy should not be made lightly as he will have a very broad and long term impact on the genetics of your herd.

An EBV is the best prediction of an animal's genetic merit that modern technology can provide; they show the difference between an individual animal's performance for a trait and the genetic base to which that animal is being compared.

EBVs are reported in the same units that the trait is measured in, for example if a bull has an EBV of +20 kg for 400 day weight, it means that bull is genetically superior by 20 kg at 400 days of age compared with the genetic base of the relevant cattle population.

EBVs are calculated for a range of traits including those associated with fertility, growth and the carcase. (A full description of all the available EBVs can be found on the BREEDPLAN website: www.breedplan.une.edu.au).

Table 1. Comparison of 600 day weight EBVs

Arnie and Brutus have 600 day weight EBVs that are above the breed average. Each of them will pass on half of their genetic difference to their progeny.

Bulls	Arnie		Brutus
600d wt EVB:	+ 40 kg		+ 20 kg:
	↓	Half of sire's genetic potential is passed on to progeny	↓
Progeny			
600d wt EVB:	+ 20 kg		+ 10 kg:

Arnie's progeny will be on average 10 kg heavier than Brutus' at 600 days of age. If Arnie and Brutus both sire 40 calves in a year, then there is a potential difference of 400 kg between the total liveweight of Arnie's progeny versus Brutus' progeny at 600 days of age.

When purchasing a bull, it is very important to have a clear breeding objective in mind so that you know which traits to focus on when reading a sale catalogue. The breeding objective for your herd will depend on the markets you plan to target as well as aiming for low cost and efficiency of production. Most breeds have a $Index EBV for domestic and export markets that combines (with varying weightings) the economically important traits, into a single EBV.

EBVs cannot replace visual assessment – a bull can have superior genetics, however they are useless if he is not physically capable of siring a calf under paddock conditions. A recommended method for selecting bulls is to study the catalogue prior to the sale and narrow your selection down to the bulls that meet your herd's requirements in terms of their genetic performance. A Bull Breeding Soundness Evaluation (BBSE) veterinary certificate on your chosen bulls can act as an insurance policy by providing an independent visual assessment of structure plus an assessment of fertility traits that are critical but not externally visible in the bull. Finally, your personal inspection provides the opportunity to assess docility and overall suitability to your herd.

Sale catalogues contain a breed average EBV table which shows how the breed has progressed since the genetic base was originally calculated (for most breeds the base was set in the 1980s and remains constantly set at zero). This table allows you to compare a bull's EBVs with the breed average for his year of birth as well as with other bulls.

When looking at bulls in a sale catalogue, some EBVs will have a higher accuracy than others. The higher the accuracy, the more confidence you can have in the EBV and the less likely that EBV will change as more performance data is analysed for that bull or his relatives. For an EBV to be published for a particular trait, it must meet a minimum accuracy requirement. Therefore, if you were considering two bulls of equal genetic merit, then the bull with higher accuracy EBVs would be the one to buy as his EBVs are less likely to change over time.

Progeny performance is something that cannot be accurately determined by visual assessment of the bull. For example scrotal size is a physical trait that is easy to see in a bull at sale, however like weight, it is a trait that is markedly influenced by nutrition as well as age and breed.

BREEDPLAN only compares animals that have been managed under the same conditions and then uses common pedigrees (genetic linkage) as a benchmark to make comparisons across herds (within a breed). Table 1 gives and example of how EBVs can be used to compare two bulls for a particular trait.

If you would like to learn more about using EBVs to enhance your bull selection, there are a number of BREEDPLAN workshops conducted regularly as well as the Breeding EDGE series of workshops that focus on breeding objectives for the northern beef producer. Please contact a member of the CQ *BEEF* team if you would like to know more.

CQ *BEEF* Billaboo group; Breeder Reproductive Performance and Management Field Day

Callistemon, Springsure
15 June 2010

Prue Becker
FBA, Biloela

The CQ *BEEF* Billaboo group identified a common interest to better evaluate the reproductive performance of their breeder herds and manage reproductive diseases. As a result, the group has developed an MLA funded producer demonstration site (PDS) focused on three main areas measuring reproductive performance, assessing the risk of reproductive diseases and developing cost effective strategies for managing diseases.

During the development stages of the PDS the Billaboo group hosted a breeder reproductive performance and management field day, where key industry professionals Dr Geoffry Fordyce from DEEDI Charters Towers and Professor Michael McGowan from the University of Queensland spoke. The field day was held on the 15 June at Bruce and Trudy Robert's property *Callistemon* near Springsure.

The day proved to be very informative and was well supported with 29 local producers attending. Some of the key topics covered on the day included replacement heifer management, breeder reproductive management and reproductive diseases. Below is a summary of the discussions on each of these topics.

Replacement heifer management

To maximize maiden heifer pregnancy rates; Geoffry Fordyce advised that weight is the most critical factor rather than age. *Bos indicus* heifers reach puberty on average around 330 kg. This is considerably higher than the long accepted target mating weight of 280 kg and consequently heifer growth from weaning is critical. Another way to assess heifer weights is the weight at pregnancy test i.e. May–June. If heifers reach 380–400 kg at pregnancy test good pregnancy rates can be expected.

Where heifers cannot achieve a suitable mating weight as yearlings, then two year old mating is preferable. However, if cattle control is an issue and significant numbers of heifers are likely to conceive accidently before joining at two years, then yearling joining can help prevent out of season conceptions. In this situation, pregnancy testing to identify when the females are due to calf, can help the implementation of management options for calving and lactation.

Heifers that calve out of season have poor reconception rates and can be at risk due to the stress of lactation running down their body condition.

Over-mating and culling heifers on the basis of foetal ageing is the most effective means of selecting more fertile animals.

Breeder reproductive management

When it comes to the older cow, Geoffry said that the most important factor in reproductive performance is body condition. Condition at calving and lactation is critical and consequently next year's conceptions are determined by this year's grazing, weaning and nutritional management.

Geoffry put forward some strategies to increase weaning rates;

- Stock paddocks according to forage availability. Property infrastructure also plays an important role in good grazing management.
- Prevent postpartum anoestrus by ensuring cows are in good body condition at calving. Cows that are in poor condition or that are having their first calf are more likely to be anestrous (not ovulating).
- It is imperative to wean at the right time; if cows loose too much condition you will be sacrificing next year's pregnancies.

Geoffry further discussed the topic of seasonal mating, and stressed that the aim is to limit the number of calves born at the wrong time of the year (when there is little or no feed to support a lactating female). Aside from the benefits of more uniform lines of weaners and the prevention of out-of-season calving, seasonal mating also streamlines the entire breeder management process and most importantly makes it easier to objectively assess the reproductive performance.

Fertility diseases

Professor Michael McGowan gave an overview of the four main infectious diseases that cause reproductive losses in breeder herds, namely; Vibriosis,Trichomoniasis, Leptospirosis and Pestivirus.

Vibriosis

This disease is spread by infected bulls and causes abortions at five to seven months of pregnancy. Most heifers return to service and conceive over three to five months but some become permanently infertile and can act as disease reservoirs.

Fortunately there is an effective vaccine and in most herds a bull vaccination program will control it. Maiden bulls require two initial vaccinations, four to six weeks apart with the second dose being given 6 weeks before mating. Thereafter bulls require an annual vaccination. Older bulls are more likely to carry the disease and culling at six to seven years is recommended. Joining maiden bulls to maiden heifers is also important.

Pregnancy testing to remove empty cows and culling cows which fail to produce a calf is important as it removes potential sources of infection.

Where high levels of infection are found heifer vaccination can lead to significant improvements in fertility.

Trichomoniasis

Trichomoniasis can cause abortions in the first five months of pregnancy and like Vibriosis is spread by

Key points

- **To maximize maiden heifer pregnancy rates; weight is the most critical factor rather than age.**
- **With older cows, the most important factor in reproductive management is body condition at calving and during lactation.**
- **Next year's conceptions are determined by this year's grazing, weaning and nutritional management.**
- **The four main fertility diseases in the breeder herds include; Vibriosis, Trichomoniasis, Leptospirosis and Pestivirus.**
- **CQ *BEEF* Billaboo group commenced collection of pregnancy test and weaner data for their Reproductive Disease PDS in June 2010.**

Table 1. The clinical outcome of infection by stage of the reproductive cycle/pregnancy when infection occurs (Guidelines for the investigation and control of BVDV, 2nd edition 2008)

Around time of mating/AI	First trimester	Second trimester	Third trimester
Disrupts ovulation and fertilisation Early embryonic death	Production of persistently infected (PI) calves Late embryonic death, abortions, stillbirths	Abortions Late delivery of unviable or abnormal calves at birth Central nervous system effects Eye defects	No reported problems associated with infection during this period
Reduces conceptions and pregnancy rates Increases returns to service Delays conception date		Reduction in number of calves born and viability of calves	

infected bulls. Because there is no vaccine, control depends on joining maiden bulls to maiden heifers, culling bulls at six and seven years, pregnancy testing to identify empty cows and culling cows which fail to produce a weaner.

Leptospirosis

This disease may cause abortions in breeders and the death of young calves but is also a serious health risk to humans. It spreads via urine from the infected animals and can enter the bloodstream through mucous membranes or other soft skin. It has the ability to mutate rapidly and live inside the host animal. The majority of herds across northern Australia have been exposed to the disease. There is an effective vaccine available.

Pestivirus

There is wide spread infection across Australia, with 'naïve' herds or 'naïve' groups within herds being at highest risk. When 'naïve' non-pregnant animals are infected they experience a transient infection and the virus is cleared by the immune system, 10–14 days after exposure. Infections are usually mild and of short duration except where cattle are in intensive situations such as feedlots where animals can experience bovine respiratory disease and other infections due to suppression of the immune system.

The infection of 'naïve' females during mating and pregnancy produces the greatest problems. The impact at different stages of the reproductive cycle and pregnancy are summarised in table 1.

Persistently infected (PI) animals carry the disease and can infect susceptible females. Every bodily secretion of a PI animal contains the virus. Most PI animals die by two years of age; however some live longer and show no symptoms of the disease.

Michael advised on some options for controlling pest virus in a herd or individual breeding mob:

- Vaccination
- Partial vaccination
- Auto vaccination - controlled, natural transmission of infection using PI animals
- Removing PI animals from the herd or management group
- Biosecurity measures.

To effectively control Pestivirus, a combination of control measures such as vaccination and implementation of biosecurity measures is recommended. For further information please go to website www.bvdvaustralia.com.au

Billaboo group PDS activities

The Billaboo group commenced collection of data for their PDS in June 2010 with six properties currently involved in the project. Pregnancy testing and weaning data has been collected and samples taken to assess the Pestivirus status of the herds. This information is being used to plan breeder and disease management strategies.

Gavin Peck
DEEDI, Toowoomba

Is your buffel as productive as it used to be?

Producers in southern and central Queensland report that buffel grass pasture productivity has declined since establishment. Graziers have observed reductions of 25–50% in carrying capacity coupled with lower live weight gains. Most graziers believe that pasture productivity decline has to be addressed to maintain profitability for their enterprise.

These findings are part of a review of productivity decline in sown grass pastures that DEEDI and Meat and Livestock Australia are currently conducting in consultation with graziers, research agencies and agri-business. Approximately 50 producers have participated in discussions held in Moura, Rolleston, Clermont, Roma, Nindigully and Wandoan.

Symptoms of pasture productivity decline

Graziers observed that productivity decline happened quicker on low fertility and lighter textured soils. Although some groups thought there was a greater overall decline on more fertile soils. Symptoms of productivity decline reported were:

- Reduced pasture growth with a reduced carrying capacity.
- Changes in pasture density with smaller tussocks and/or reduced numbers of tussocks.
- Nitrogen deficiency symptoms of yellowing and/or reddening of leaves.
- Reduced animal performance with lower weight

gains and increasing difficulty in reaching market specifications.

- Pasture composition changes with more native grasses and increased density of less productive exotic grasses.

Nutrient cycling (especially nitrogen), overgrazing, reduced rainfall infiltration and disease were all recognized as contributing to declining pasture production. There were differing views as to the relative importance of these causes, however previous research has demonstrated that nitrogen availability is the primary cause.

How are graziers addressing productivity decline?

Most producers indicated that pasture productivity decline had to be addressed in their enterprise. Some producers believed it may not be currently economic to renovate pastures, but as productivity declines further it will reach a point that it pays to do something.

The mitigation strategies used by graziers were:

- Mechanical renovation ranging from single cultivations (e.g. chisel ploughs, ripping or blade ploughing) through to short term cropping or crop/pasture rotations. There were mixed reports on the results of renovation depending on the method used, seasons and the reason for renovation (e.g. scalded areas compared to poor pasture growth). Many participants observed good responses on initial mechanical renovation but rundown occurred more quickly with poorer responses to subsequent renovations. Other producers have renovation cycles where pastures are cultivated every few years.
- Legumes for improved feed quality and nitrogen fixation. These benefits are recognized through improved prices for land with Leucaena but not for other legumes. Producers reported mixed results from legumes with successes but also many failures. Many producers did not think legumes other than leucaena were a viable option with buffel grass due to its competitiveness despite notable examples to the contrary (e.g. figure 1). Most producers thought legumes were either not widespread or not as widespread as they should be in their district. Key constraints of legumes identified by producers were:
  - Establishment – legumes are difficult to establish in buffel pastures however most producers are using low cost and low reliability establishment techniques (e.g. 'chucked out of a plane').
  - Persistence – even when legumes are established few species have persisted long term.
  - Adaptation – Need commercially proven legumes for clay soils in central Queensland, and summer growing legumes for all land types in southern Queensland.
  - Nitrogen fixation – the amount fixed and the effect on companion grasses was questioned by most participants.
  - Production – the amount of dry matter production has varied widely.
- Fertilizer. No one in the groups routinely uses fertilizer on their pastures however several people have tried it. Most people did not think fertilizer on buffel pastures is economically viable or environmentally sustainable.
- Spraying out of buffel grass on small areas has been observed by several graziers to provide a response similar to mechanical renovation.
- Fire. Some producers strongly supported the use of fire reporting greener buffel grass and better growth. Other people were strongly against the use of fire suggesting negative responses.
- Other grasses. Decline was observed to occur in all sown grass pastures however it was considered more of a problem with buffel.
- Grazing management was thought to have some impact on rundown.
- Woody vegetation rotation where suckers are allowed to grow before being chained was thought to improve nutrient cycling by some participants.
- Slashing is thought to improve grass growth by some participants.
- Soil biology treatment – compost teas have been tried by a few participants with no visible response.
- Live with rundown and accept lower production. Options under this strategy were buying more land, developing more land, supplementing cattle and reducing stocking rates.

Other parts of the review

A grazier in central Queensland advised the project that 'Poly pipe, Brahman cattle and blade ploughs have driven productivity gains; the next step is to address rundown and improve pasture production'. With this in mind the review will help guide research and development into the future.

In addition to consulting graziers, the review is also:

- Consulting researchers, pasture seed companies and resellers.
- Mapping the distribution of buffel grass in Queensland.
- Analysing the economic returns of management options used to address pasture productivity decline.

Owen Anderson, Moura CQ BEEF group, inspecting Caribbean stylo established in buffel grass pastures on brigalow soils on his property near Theodore. The legume seed was sown behind a blade plough 13 years ago (March 1997). Initially there were only isolated legume plants but it has thickened dramatically in recent years.

Key points

- **Productivity decline in buffel grass pastures is widespread with 25–50% reduction in carrying capacity.**
- **Range of ways to reduce the impact, however for most buffel pastures graziers have simply reduced stocking rate to maintain land condition and animal performance.**
- **Mechanical renovation and legumes are the most widely used approaches to improve pasture production in rundown buffel.**
- **Important issue for the beef industry with significant opportunities to increase productivity.**

Ken Murphy,
Mick Sullivan
DEEDI, Rockhampton

Ross Dodt
DEEDI, Mackay

Russ Tyler
DEEDI, Brian Pastures

Alan Laing
DEEDI, Ayr

Getting started with controlled mating

The December 2009 edition had an article on controlled mating. The practice is widely adopted because it can improve enterprise performance by producing more even lines of sale cattle and simplifying branding and weaning operations. Another major advantage is that enables more effective identification of better performing breeding and growing animals.

Breeder body condition is one of the critical factors in getting cows to cycle. Good grazing, weaning and supplement management is needed to have cows in Body Condition Score 3 (1–5 scale) or better at calving. Poor body condition is the principal cause of low conception rates in controlled mated herds and extended inter-calving intervals in continuously mated herds.

Moving to controlled mating

The traditional approach has been to start mating heifers in the desired time period and gradually reduce the joining period for the rest of the herd. In the first year, bulls could be removed in September then July and the desired end point reached over another year or two. Depending on the calving pattern of the herd and how body condition is managed this would see a small drop in calf numbers until the herd settles into the desired calving period. A problem with this approach is the time required for the benefits of a tighter calving to be realised.

Pregnancy testing can identify the out of season calvers and if these are sold the herd can be quickly converted to the desired calving period. However, this approach is likely to cause a significant reduction in breeder numbers and consequently weaner numbers until the herd builds back up to its normal size. Selling the out of season breeders will generate extra income in the short term but the reduced weaner numbers will flow through to lower turnoff numbers and income. The timing of the impact will depend on the age of turnoff. The extra income generated by the sale of 'cows that will calve out of season' can be saved and used when income from 'normal' turnoff drops.

Retaining all or some of the outer season calvers and managing them into the desired calving period is the more common approach as it has less impact on breeder and weaner numbers and income. There will be some impact on weaner numbers due to the need to have a longer intercalving interval for some cows during the conversion e.g. not rejoining cows that calve in the dry season until December.

When should mating start?

There are many factors that need to be considered when deciding the optimum calving period. Calving too early means that early calvers are lactating a long time before the season breaks. Conversely, calving too late means that late calves have to be weaned young and light if all calves are to be weaned before winter. The general 'rule of thumb' is to have all calves on the ground before Christmas. This enables a well grown calf to be weaned in April–June before feed quality has declined too much. Calving by Christmas assists drought management as weaning down to 100 kg can commence in March if required.

The key factor in determining the calving period is the season with the aim of having most cows lactating when feed is good. While no two seasons are exactly the same rainfall records are a good guide to when a seasonal break can be expected. Rainman software can be used to determine the probability and likely dates of particular rainfall events (table 1).

In 50% of years a 40 mm rainfall event does not occur until November and in many cases late November. The date when this event occurs in 70% of years ranges, from 24 November at Bajool to 25 December for Clermont. Breeders need adequate body reserves and grazing management has to be planned, so cows can lactate on poor quality feed until the end of December without loosing too much body condition.

Cows that calve in July–August potentially face very long periods on poor quality feed (table 2). This was a particular problem in 2009 when feed was below maintenance from early June and most areas did not get a seasonal break until Christmas. The problem is more acute with first calf cows due to their higher nutritional requirements.

Because of the risk of a late seasonal break many producers in central Queensland commence joining from mid November to mid December. This is a good compromise between the risk of calving too early and the costs in weaner weight of calving too late. Some producers successfully calve in July - August but they are prepared to proactively manage the situation and wean very early (before Christmas) if necessary to preserve cow body condition. Early calving is less of a risk on better country, with conservative stocking and good supplement management.

Table 1. Dates in 50% and 70% of years when a rainfall event of 40 mm over three days can be expected at selected central Queensland locations (Rainman)

Location	Date in 50% of years	Date in 70% of years
Bajool	2 Nov	24 Nov
Biloela	23 Nov	17 Dec
Blackwater	19 Nov	18 Dec
Clermont	21 Nov	25 Dec
Emerald	19 Nov	14 Dec
Rolleston	4 Nov	2 Dec
St Lawrence	19 Nov	6 Dec

Table 2. Days to a seasonal break for a range of mating and calving dates

Mating date	Calving date	Days to seasonal break at	
		1 Dec	1 Jan
1 Oct	18 Jul	136	167
1 Nov	18 Aug	105	136
1 Dec	17 Sep	61	106
1 Jan	18 Oct	44	75

In dry years and when the seasonal break is late it is a common practice to delay the start of mating on the basis that 'the cows won't be cycling'. This is detrimental to herd performance because it delays calving in the whole herd which will carry over for a number of years. Also it means that the fertile cows (and there are plenty of them) which cycle when lactating under tough conditions are prevented from conceiving at the right time. This sets them on the road to a later calving pattern.

Mating periods

To produce a calf every 365 days cows have to reconceive early in their lactation. As *Bos indicus* cattle have a 290 day pregnancy (283 days for *Bos taurus* breeds) they have 75 days from calving to reconceive. This effectively becomes 33 days as few cycle in the first 42 days after calving.

Quick reconceptions are hard to achieve on tougher country such as coastal spear grass and mating periods of four to five months are usually required for lactating cows. The longer calving period invariably means two weanings. If the first weaning is undertaken in March–April, weaned cows which have not yet cycled will usually conceive after weaning. Maiden heifers joined at two years and any empty cows retained from the previous year should conceive in three months. If you give them longer you are not chasing performance.

On better country such as brigalow, all breeders should be conceiving in three to four months.

Some producers and particularly those on tougher country leave bulls in for longer and use pregnancy testing to control the calving period by culling late conceivers. This gives some flexibility in drier years if conception rates are down. However, without accurate foetal ageing and rigorous culling the system fails. Allowing mating periods to extend is often the start of out of season calving again.

An important consideration must always be that most of the herd are calving at the right time, so those that do not are less fertile and herd improvement is delayed by retaining them.

Heifers

Maiden heifers are the best starting point to implement controlled mating. Whether you are mating yearling heifers or two year olds, the management considerations are the same. Country type is the principal determinant of whether you mate yearlings or two year old heifers. Heifers are 330 kg on average when they reach puberty so they need to be this weight at mating or reach it early in the mating to achieve good conception rates. Heifers require good management from weaning and unfortunately in dry seasons, they are often not a priority with preference given to pregnant or lactating breeders.

Introducing controlled mating increases the culling rate in the breeder herd because cows are under greater pressure and poorer performers are identified and removed. Consequently, joiner heifer numbers need to be increased as soon as the conversion to control mating begins.

The *Breedcow/Dynama* herd budgeting software package is a valuable tool for assessing breeder herd structure, culling rates and joiner heifer numbers.

Older breeders

The strategy adopted to move older breeders into controlled mating has to be developed on an individual property basis to take into account herd structure, seasonal conditions and property finances. If most cows are already calving in the desired period it is easier than if there are significant numbers of calves being weaned in the second half of the year.

Pregnancy testing with accurate foetal ageing enables segregation and management of breeders on the basis of when they will calve. Knowing how many will calve out of season allows the impact of culling some or all of these to be assessed. Old cows calving out of season can be calved out and fattened rather then rejoined. In a dry year these animals are a risk and selling them is often the best option.

Getting out of season calvers into the desired pattern requires their remating to be delayed. For example many cows calving in May are likely to reconceive during the dry season and so remain out of sequence. If the bulls are kept out until say December they will conceive at the desired time but production of their next weaner has been delayed. Knowing how many cows will calve after the desired period and when, enables a decision to be made on whether these cows need to be rejoined to prevent next year's weaning being adversely affected.

Segregating the out of season calvers enables earlier weaning to ensure they have adequate body condition when rejoined.

The first weaning round is an opportune time to pregnancy test and segregate dry cows as they can be easily drafted off and segregated into management groups. This will also identify dry empties that can be culled.

The wet cow group will comprise freshly weaned cows and those to be weaned on the second round. At the second round, when the balance of the cows are weaned, they can be pregnancy tested and segregated into management groups. This avoids having to mother up and draft cow and calf units.

Key points

- **Controlled mating where appropriate is a critical strategy for improving herd performance.**
- **Because calving has to begin in the late dry season, timing the beginning is a compromise between the risk of calving too early and the costs in weaner weight of calving too late. Likely date of the seasonal break is an important consideration.**
- **Heifers are the starting point for implementing controlled mating.**
- **Pregnancy testing and culling cows that will calve out of season can be used to bring continuously mated herds into controlled mating.**
- **Controlled mating will not work if breeder body condition is not maintained with good grazing, weaning and supplementation strategies.**

Stuart Buck
DEEDI, Biloela

Ripping prior to planting leucaena on loam soils improves establishment

Background

A common theme in the Biloela CQ *BEEF* group is the need to increase production, and a range of options and strategies have been developed, including the utilization of Leucaena. Many producers in the Biloela group have already planted leucaena with a number wishing to extend existing plantings. However rising input costs (fuel, fertilizer, chemical, and labour) have many growers asking questions about establishment options to minimize costs and lost production time, yet ensure successful establishment.

The key establishment option for investigation was whether to pre-rip the leucaena rows prior to planting. Ripping is advocated to provide a better soil environment, including greater soil-water and fewer impediments to root growth, resulting in reduced establishment risk (failure) and more vigorous, even growth during the establishment period which produces earlier and more productive grazing in the long term.

Establishment costs are a significant barrier to the adoption of leucaena primarily due to the high initial costs and the time period before returns are received (up to 3 years). Ripping prior to planting can add $75–$100/ha to establishment costs depending on the row spacing and machine used. Therefore planting without ripping reduces establishment costs; however the question remains as to the risks and longer term production costs associated with not ripping.

Methodology

To investigate this issue, two trials were initiated with support from the MLA Producer Demonstration Sites project on separate properties in the Biloela district. Trial 1 was established on native bluegrass country with non-cracking loam soils and trial 2 on buffel country with cracking clay soils.

With the aim of retaining the existing grass for soil erosion control and minimising establishment costs, strips 3 m wide (width of equipment) on 6 m centres (trial 1) and 8 m centres (trial 2) were cultivated first using a Yeomans ripper, followed by a number of passes with an offset disc plough. Once strips were prepared, selected areas were ripped and others left for comparison. Ripping was undertaken with a Caterpillar D5 bulldozer with 2 tynes 1 m apart, which penetrated to around 65 cm. After ripping, the strips were ploughed a few more times to prepare a seedbed and control weeds.

Trial 1 was planted late January 2009, and trial 2 was sown in February 2010. Both trials were sown on good moisture profiles to the variety Cunningham at about 3 kg/ha with a double disc opener set on twin rows 1 m apart. Spinnaker and Roundup were applied to control weeds both post-planting pre-emergence. No fertilizer was applied. Very good establishment resulted because of thorough paddock preparation (well prepared seedbed, stored soil moisture) and the use of an effective planter.

Soil measurements (moisture and nutrients) were taken just prior to ripping and then again at planting. A three month fallow occurred between these operations.

Outcomes and benefits

Trial 1 – Non cracking loam soils

Soil measurements at planting indicate greater moisture accumulation in the ripped plots compared to non-ripped (figure 1). This was due to the non-ripped plots loosing moisture over the fallow period, whereas the ripped plots maintained moisture (or slightly increased) This result was a little surprising as it was expected that soil moisture would have accumulated in both areas, with the ripped areas to accumulate significantly more moisture. However this was not the case.

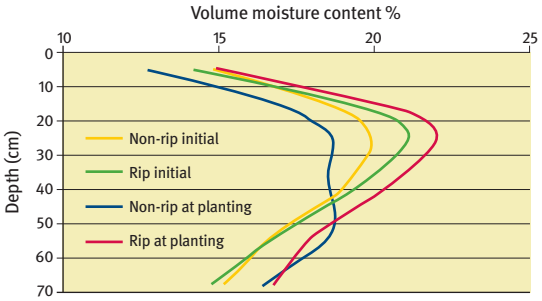


Figure 1. Soil moisture pre-ripping and at planting Trial 1

Plant measurements were collected 4 months after sowing (late May 2009), at the end of the first growing season. Leucaena yield was significantly higher where the soil was ripped, and more plants had established (table 1).

Measurements taken 14 months after planting (March 2010) showed the large differences in yield that were measured initially had disappeared. Plants in the non-ripped plots had caught up with their ripped counterparts and leucaena yields were no longer significantly different (table 2). The first grazing occurred after these biomass measurements were taken.

Table 2. Leucaena yield – trial 1 at March 2010

Treatment	Leucaena yield (kg/ha)
Rip	1,090
Non-rip	956

Table 1. Leucaena yield and plant populations – trial 1 at May 2009

Treatment	Leucaena yield (kg/ha)	Plant population (plants/m of row)	Plant population (plants/ha)
Rip	418	13.5	44,861
Non-rip	240	10.2	33,889

Trial 2 – Cracking clay brigalow soils

Soil measurements taken at the start of the fallow period and again at planting show large differences in soil moisture accumulation, demonstrating the benefit of capturing rainfall and controlling weeds (including volunteer grasses) during the fallow. However, at planting there was no difference where ripping was conducted compared to the non-ripped areas (figure 2). This could have been due to the cracking nature of this soil, where ripping provides minimal water infiltration benefits compared to those obtained in non-cracking soils.

Plant measurements were collected 4 months after sowing (late June 2010). There were no significant differences in leucaena yield or plant population due to ripping (table 3). More measurements will be collected in about 12 months to determine longer term impacts.

Results to date have provided several valuable insights which will assist producers to ascertain when ripping might be beneficial prior to planting leucaena. On the loam soil type (trial 1), ripping has provided significant establishment benefits during the initial 4 months of growth, however, 12 months later these differences had disappeared. On the cracking clay soil type (trial 2), ripping has not provided any benefits to date.

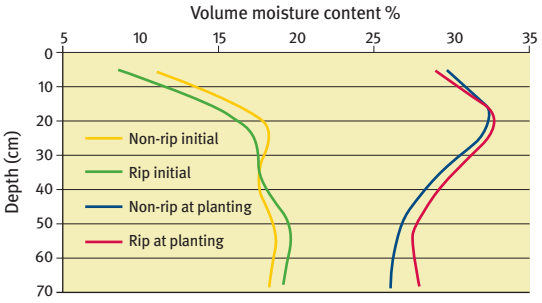


Figure 2. Soil moisture pre-ripping and at planting trial 2

Treatment	Leucaena yield (kg/ha)	Plant population (plants/m of row)	Plant population (plants/ha)
Rip	329	13.6	45,300
Non-rip	326	12.9	43,000

Table 3. Leucaena yield and plant populations – Trial 2 at June 2010

Key points

- **Leucaena has the potential to improve production and enterprise profitability; however rising input costs are increasing the cost of establishment.**
- **Pre-ripping is advocated to provide a better soil environment resulting in reduced establishment risk (failure) and vigorous growth.**
- **Ripping on a non-cracking loam soil has increased soil moisture at planting, resulting in higher Leucaena biomass and plant populations during the initial 4 months of growth. However this difference had disappeared 12 months later.**
- **On a cracking clay soil, ripping did not increase soil moisture levels at planting and no leucaena biomass or plant population differences were measured 4 months after sowing.**

Family businesses – Do's and Don'ts

This issue of maintaining smooth relationships in family businesses is one that faces all businesses; rural and commercial. It is an issue that should be planned for from the start of any business.

From working across many businesses we have observed some strategies that may take some of the friction out of business succession and make life easier and happier. It is important to remember that the purpose of a business is to provide a life for those that work in it.

DO have **SMART** (simple, measurable, agreed, realistic and time constrained) goals. Goals should be developed for the business and each person in the business should have their own personal goals.

The goals should be part of a written business plan. A business plan should include job descriptions, roles and responsibilities, salaries and wages as well as a working plan for the property and other assets of the business.

DO review the business plan annually. It is also important to monitor the performance of the business.

DO hold regular structured meetings to discuss plans and determine written action items.

DO have written salary packages for each member of the business with benefits listed. Salary packages should reflect individual roles and responsibilities. If someone is being paid a lower wage because they are to receive ownership, make sure it is written down and all parties understand the arrangement.

DON'T assume that everyone knows anything. Mind-reading hasn't been perfected yet!

DO keep talking and communicating, no matter what happens. **DON'T** let small issues simmer; talk them through.

DO plan for a fair (not always equitable) share of the estate for off-farm offspring. This may be done using off-farm investments.

DO investigate alternative ownership structures (pros and cons) for the business. Company structures may offer more protection in times of hardship. Accountants and solicitors can provide advice on this.

DO make sure that every person in a business with dependants has income protection and life insurance. This includes partners who don't work directly in the business – if something happened to them, who would care for your children?

DON'T be afraid to seek independent professional advice. Use a mediator first, and then accountants/ solicitors to draw up the documents after agreement has been developed.

DO maintain a will relevant to tax laws and business circumstances.

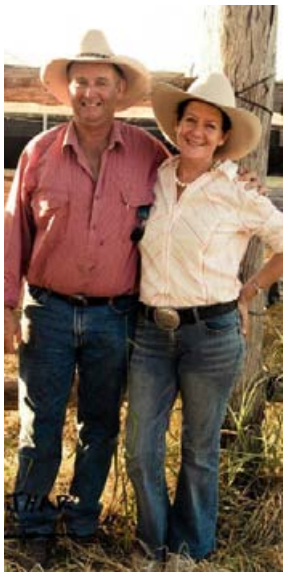
DO have written rules and policies regarding holidays. **DON'T** feel guilty about having holidays. **DON'T** have holidays at home.

DON'T make informal loans to any family member. Loans made to any family member should always be properly written up, so there is no confusion about repayments and repayment periods.

Finally, **DON'T** think that you are the only person in the world with relationship problems within a family business. With clear agreements and communication though, many of these problems can be solved.

If you would like more information or assistance with succession planning some useful websites for a starting point are:

www.proagtive.com.au/index.cfm?page_id=1011&display_news_id=
www.brennanmayneag.com.au/
www.successionservices.com/index.html
www.highresolutions.com.au/ - Lyn Sykes



Don and Kaye Black

Producer profile
Black family

The Black family business consists of two properties *Langley* and *Morpeth* in the Middlemount district, a 9000 ha aggregation in total. Don, Kaye their eldest son Adam and his partner Kristie all reside on *Langley* which is situated half way between Middlemount and Clarke Creek on the May Downs Road. It consists of approximately 1600 ha brigalow scrub country with predominantly black soils and some melon hole country, 2800 ha of easy slopes and flooded brigalow coolibah flats and 500 ha of box forest easy slopes on sandy soils. Adam works full time for the family business while Kristie works for the Fitzroy Basin Association as a field officer for the Isaac/Connors Catchments. Donald is also a councillor on the Isaac Shire Council.

Morpeth is situated 10 km off the Beef Rd near the Valkyrie School and is home to Brendon and his partner Anna. Brendon works at the Coppabella mine, Anna works on *Morpeth* and gets assistance from Brendon on his days off. *Morpeth* comprises 4100 ha of brigalow scrub country. *Langley* and *Morpeth* are 100 km apart and both properties are set up to grain assist with grain grown on *Langley*. Don and Kaye comment that feeding grain in the paddock when required helps to keep the turnoff flowing all year round.

The Black's run mainly a fattening operation but also run 400 breeders. They sell approximately 1500 bullocks per year, mainly direct to Swift or Teys meatworks in Rockhampton or Borthwicks Mackay depending on which is offering the best price. Store stock are purchased either privately through regular suppliers or through the Nebo, Emerald and Gracemere saleyards when necessary.

The Black's are currently in the process of having *Langley* EU accredited to widen marketing options, and are confident that their grain assist regime will help their cattle meet the grade. The 550 ha of farming country on *Langley* grows forage for silage, sorghum and wheat. Most grain is fed in their grain assist program with any surplus sold. The investment in an Excel Stubble Warrior Planter is reaping rewards for the cropping enterprise with 950 tonnes of sorghum harvested off 260 ha of dryland cultivation. The 12 metre precision planter, with 1 m row spacing's guarantees a good strike in harder soils says Don.

The Black family also operate a Brahman stud 'Cobra Ball Brahmans', selling bulls through private sales to repeat buyers annually. Recently they have begun breeding Brangus bulls following increased demand.

The vision for the business is 'to improve productivity and profitability in order to allow the business to support all family members involved, at the same time as improving land condition'. Kaye says the best thing about being a part of CQ *BEEF* 'is the access to support staff that we don't usually get. The incentive to look into production figures closely and the enthusiasm for the business that you get from meeting with like minded producers. We've been fine tuning our supplementary feeding and our recording capabilities. The first thing we realised when doing *Probe* was that we don't keep enough accurate records. We have always known that our cost of production was too high and have been able to identify partially why. We are hoping to understand more from our second year of undertaking *ProfitProbe*', Kaye says.

When asked about what they are passionate about in the industry Don and Kaye respond 'We are very passionate about how difficult it is for the younger generation to get a start in this industry. There are no incentives and high interest rates make it near impossible. We see a scarcity of food and water coming worldwide. Australia could be in the box seat with help from the government. The food we produce, both beef and grain is done on natural rainfall. This should be encouraged and expanded and is the way of the future'.

Another passion for the family is campdrafting. Don and Kaye are the brains and legs behind the Clarke Creek Campdraft as president and secretary. Adam and Kristie are keen competitors.

When they do eventually get time for a break Kaye would like to take in 'the Greek Isles, Italy and Tuscany sampling local cuisines all the way', Donald would prefer a look around Australia.

Staff profile
Lyndal Rolfe
Biodiversity Officer
Fitzroy Basin Association

Childhood: Born in Springsure and grew up on our family property between Springsure and Rolleston.

Career: Completed a Bachelor of Applied Science Animal studies and specialised in Pasture and Rangeland Management at University of QLD Gatton. Once I graduated I went to Goondiwindi as a Research Assistant at the UQ Veterinary Centre. In 2005, I took a position with the then DPI&F working on a project in the Mitchell Grass region, following this I worked with Agforward in Emerald as a project officer. In July this year I commenced work with FBA after spending 12 months travelling and working in Scotland.

Interests: Travel, cycling and horses.

Something I have achieved: I have cycled the Camino De Santiago, a pilgrim trail that starts in France and runs across Northern Spain to finish in the city of Santiago de Compostela. ... I didn't get a flat tyre or lost!