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The Best in the West
The first step towards identifying training needs

IF you do what you’ve always done, you’ll get what you’ve always got, but choosing the new thing to do can be a daunting process.

Past experience tells us that learning something new takes time and effort and that new knowledge, once gained, must fight against old habits and the safety of the comfort zone before it can be used. Because making change is hard, the motivation to persist needs to be strong.

Many beef producers are currently experiencing the pressures of negative motivating forces such as poor seasons, low returns and high debt burdens.

These factors certainly provide motivation for change but provide no guidance for what change is needed, apart from ‘get out of cattle!’

For those looking for more positive motivation, the process of completing a self-assessment module in the Grazing BMP program might be the answer.

The old adage “you can only manage what you can measure” is one that fits well with Grazing BMP — a program that allows producers to measure what they do to better manage the outcomes they achieve.

The program also provides a link to training, extension and some funding opportunities to producers choosing to improve an area of their business.

One of the central Queensland graziers has been motivated to think about change after looking at how they ‘stack up’ against industry best practice in most areas, with just a little tweaking required here and there.

“However, in the business module, there were a few areas where we just weren’t up to speed,” said Ann, who and Larry have worked hard on fat from their operation and feel they really have little room to move in reducing costs.

“In our industry, the margins are now so small, we have to be able to put our businesses under the microscope,” said Ann.

“Larry and I knew we needed to be able to analyse our business more closely, but we didn’t know where to start.”

“We had looked at the Business Edge course before, but had been unable to justify the expense.”

However, following the BMP workshop, the decision was made to invest time and money in gaining new knowledge and skills and Ann attended the Business Edge workshop in Rockhampton on August 14-15.

The Fitzroy Basin Association (FBA) provided some welcome funding assistance, covering part of the cost of the workshop for attendees from the Fitzroy Basin.

“We were looking for some alternatives that didn’t just involve working harder; we wanted to maintain a balanced lifestyle by maximising what we could get out of our business,” said Ann.

After attending the Business Edge course, Ann feels she now has the starting point to be able to truly determine what she should be focusing on.

Using their current accounting package, Ann has made some adjustments in order to generate her own management reports.

These reports will show true business performance without the distortion of tax compliance, which relies on unrealistic assessments, which relies on unrealistic assumptions.

Larry and Ann are keen to look at where their business may be under-utilised and now have the tools they need to analyse possible alternative options, such as intensive cropping on their small parcel of irrigation land.

Whatever Larry and Ann decide to do in their business, they will have confidence that their decision is based on realistic figures.

Proper business analysis gives producers far greater control of the outcomes they achieve and in today’s market, that’s worth a lot.

Jo Gangemi
Beef Extension Officer
futurebeef.com.au
0749029178

What’s on:

● Turn to page 12 to find out about the AI training course to be run at Mundubbera.

KEY POINTS

● Grazing BMP (best management practice) can provide positive motivation for change of practice.

● The Grazing BMP program is linked to extension, training and support.

● For graziers looking to improve their financial literacy and understanding of business performance, Business Edge is a great training option.

● Larry and Ann Coward from Fairview, Calliope, travelled the path from BMP to Business Edge and are working to implement new knowledge and skills into their business.

The Grazing Best Management Practices (BMP) self-assessment program has identified some training gaps for beef producers Larry and Ann Coward from Calliope. If you’re keen to benchmark your practices against industry standards and identify areas for improvement, get in contact with your local beef extension officer. We are only too willing to help.

When you brand your calves this summer remember the correct formula for calculating a branding percentage is:

Branding % = No. of calves branded in 365 days No. of cows mated in last year’s 365 days x 100

Also some important questions to ask at branding time are:

How many conceptions did you lose from your pregnancy testing to branding?

What was the pattern of conception like? When did the conception occur?

Are the cows in a body condition where they will be able to support the number of calves dropped after pregnancy testing to branding?

What was the weaning weight of your calves and how many calves dropped after pregnancy testing to branding?

Are the cows in a body condition where they will be able to support the number of calves dropped after pregnancy testing to branding?

If you have a problem with branding, please contact Larry at (07) 4983 7467 Emerald Beef Extension Officer or Jo Gangemi 07 4902 9178, Beef Extension Officer.
management program

Ann and Larry Coward at the Gracemere Saleyards. - Picture courtesy of Kathleen Calderwood/IAPN

We were looking for some alternatives that didn’t just involve working harder; we wanted to maintain a balanced lifestyle by maximising what we could get out of our business.

● Climate Clever Beef - to deal with the impact of climate change and manage greenhouse gas emissions while improving business resilience
● Grazing BMP program - to improve the economic and environmental performance of beef enterprises
● Next Gen Beef Breeding Strategies - investigating genetic and genomic strategies to increase beef reproductive efficiency in northern Australia.

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The FutureBeef website is home to a suite of more than 150 projects.

From cutting-edge research to innovative extension, you will find the FutureBeef team in the thick of it!

Working with producers, the FutureBeef team is supporting sustainable and profitable productivity gain through collaborative projects including:

Botulism risk increases during drought times

WHAT IS IT?

BOTULISMS is a paralysing disease caused by botulinum toxin, which is produced by the bacterium Clostridium botulinum. Botulinum toxin is important as one of the most potent toxins known to mankind. Only a small quantity is needed to produce disease.

Clostridium botulinum spores are common in the soil, and also in the gut of healthy cattle and other animals in tropical environments (which includes most of Queensland), where they are not a problem. Spores are the dormant form of the organism.

Only the actively growing Clostridium botulinum bacteria produce botulinum toxins, i.e. the toxin that causes disease. Clostridium botulinum spores only germinate and grow where oxygen is totally excluded, such as within rotting animal and vegetable matter. The toxin binds strongly to nerve endings, preventing nerve impulses to muscles and causing paralysis.

Seven types of toxin have been identified, designated A to G. In Australia most botulism outbreaks in cattle and sheep are due to types C or D toxin. Once produced, the toxin is quite stable and may remain in contaminated feed or water for some time. Vaccination is the only effective way to prevent botulism from occurring.

WHERE IS IT SEEN?

Botulism is commonly seen in Queensland, especially in phosphorus deficient areas and during droughts, where it is often associated with cattle eating bones and carrion to satisfy a craving for phosphorus and/or protein.

Outbreaks are also seen in intensively fed beef and dairy cattle mostly due to feedstuffs contaminated with dead animals such as snakes, birds, possums, mice. Large outbreaks have occurred in dairy cows being fed total mixed rations based on silage. In some cases, producers have lost two-thirds of their dairy herd over a two-week period. Other outbreaks have involved daily herds where poultry litter has been used to fertilise pastures.

Legislation now prohibits feeding animal matter, including chicken faeces and chicken litter to livestock and livestock must be denied access to this material.

SYMPTOMS

Symptoms vary dramatically depending on the dose of toxin and any pre-existing immunity that may be present. Signs vary from sudden deaths (animals collapse and die in a couple of hours) to a slowly progressive paralysis where animals may take days to die. In the latter case, the first signs are cattle off their feed and water. Then they develop a wobbly gait (staggers) and eventually go down. During the staggers stage, some cattle become aggressive because they feel helpless. Not all cattle that develop botulism symptoms will die. Some mildly affected cattle will recover. Generally speaking, once cattle go down, their likelihood of recovery is poor.


On the other side of this page...

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Ann and Larry Coward at the Gracemere Saleyards. - Picture courtesy of Kathleen Calderwood/IAPN

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Ann and Larry Coward at the Gracemere Saleyards. - Picture courtesy of Kathleen Calderwood/IAPN

Online information at your fingertips
Tips for using Breedplan data when selecting your bulls

Critical tools to guide objective selection

<table>
<thead>
<tr>
<th>Lot</th>
<th>Id</th>
<th>Gestation Length (days)</th>
<th>Birth Wt (kg)</th>
<th>200 Day Wt (kg)</th>
<th>400 Day Wt (kg)</th>
<th>600 Day Wt (kg)</th>
<th>Milk (kg)</th>
<th>Scrotal Size (cm)</th>
<th>Eye Muscle Area (sq.cm)</th>
<th>Rib Fat (mm)</th>
<th>Sump Fat (mm)</th>
<th>Retail Beef Yield (%)</th>
<th>IMF (%)</th>
<th>Export Steer Index ($)</th>
<th>Domestic Steer Index ($)</th>
<th>Comments</th>
</tr>
</thead>
</table>

BREEDPLAN estimated breeding values (EBVs) and individual animal data, e.g. scrotal circumference, are critical tools to guide the objective selection of bulls that will improve the growth, fertility and carcase traits of the herd. However, the volume of data available can make evaluation difficult and time consuming. The tips presented below can make handling and evaluating Breedplan data easier.

COLUM HEADINGS FOR BREEDPLAN DATA

When sale catalogues or data is downloaded from Breedplan into Excel, the column heading for each of the Breedplan EBVs, e.g. 600 Day Wt (kg) and breed indexes are spread over three or four rows. This makes sorting data difficult.

The solution is to create a one-row header of the Breedplan EBVs traits, which can be placed on top of the data. The table above shows the header row for Brangus Breedplan data. Applying the Excel data table filter to the column headings makes it easy to sort the data by any EBV, e.g. sort the animals from highest to lowest scrotal size (cm) EBV.

Colour coding makes it easier to identify bulls with below average scrotal size.

Adding a comments column enables notes to be made on individual bulls when looking at the data and the bull.

For example, EBVs in the top 29pc could be coloured green; those above average blue; and the average EBVs yellow.

This system avoids having to refer back to breed average and percentile bands data.

Colour coding makes it easier to identify bulls with a good balance of growth, fertility and carcase traits.

PHENOTYPIC DATA

The phenotypic data (commonly called supplementary data) presented can comprise:

- Live weight
- Scrotal size
- Horn status
- Carcase scan data (e.g. EMA, rump and rib fat, IMF etc)
- Sperm morphology

Guidelines for scrotal size relative to live weight are used to identify bulls with better phenotypic scrotal size.

A column can then be added to the bull data table to identify bulls with above average scrotal size for their weight.

FORMATTING DATA

It is worth taking some time to format data and pages so the data is easier to look at on the screen and when printed. Good formatting also makes printed sheets easier to handle when looking at bulls in the yard.

If you would like help with organizing and evaluating your data please contact your local beef extension officer.

Mick Sullivan
Beef extension officer
(07) 4923 6223
mick.sullivan@daff.qld.gov.au

If you would like help with organising and evaluating Breedplan data please contact your local beef extension officer.

Ben Thomas
Beef extension officer
(07) 4071 9223
bthomas@mla.com.au

Global demand for Australian beef likely to hold strong

QUEENSLAND cattle markets continue to feel the pinch after two very dry years for most regions have driven slaughter numbers to levels not seen in almost four decades and minimal interest from re-stockers.

However, while there has been heavy pressure on the markets from the large cattle supply, some very positive factors are likely to remain in place over the coming years, adding support to cattle markets once the drought breaks.

Northern beef producers have seen incredibly strong live cattle export demand, where more than one million head of cattle were destined in the past 12 months. The total number of live cattle exports for 2014 and 2015 is forecast to exceed one million head, with demand from Indonesia and growing demand from newer markets such as Vietnam. Through the strong live export trade, markets such as the Middle East, Indonesia, the EU and China continue to demand high volumes of slaughter cattle.

The US will be Australia’s largest beef export market in 2014, with the tight US supply situation causing manufacturing beef prices to find new highs over the course of the year.

While the Australian adult cattle kill has been at levels rarely seen, meaning once there is a break in seasonal conditions, the capacity for herd growth to respond will be slower than in previous years. This, combined with the likely maintenance of strong global demand for Australian beef, should provide plenty of support for cattle prices over the coming years.

While demand from our traditionally largest customers (Japan, Korea, and the US) is likely to remain strong, markets such as the Middle East, Indonesia, the EU and China continue to demand high volumes of Australian beef during the extended period of surging supplies.

The current national herd liquidation is at the cost of the breeding herd, with female kill rates at levels rarely seen, meaning once there is a break in seasonal conditions, the capacity for herd growth to respond will be slower than in previous years. This, combined with the likely maintenance of strong global demand for Australian beef, should provide plenty of support for cattle prices over the coming years.

To book your advertisement or for more information contact GAYLE HOPES (07) 3826 8232, 0421 655 138 or email: gayle.hopes@fairfaxmedia.com.au

Bookings close 5 December 2014.

45% Qld farmers with high school aged children send them to a boarding school.
The Queensland government has released a suite of changes to rural leasehold land legislation. These changes make leases more secure and allow for easier and more affordable conversion from a lease to freehold title. Lease payments for term leases will also become more affordable under the new arrangements.

To make leases more secure, the government has committed to rolling term leases. Rolling term leases have already been offered to all eligible rural leases that are due to expire before December 31, 2034. Rolling term leases offer an immediate extension of a lease term for the same period as the lease was originally issued for.

To reduce costs and help ease the financial burden on rural landholders, the government has changed the way it calculates annual rental. These changes affect term leases, licences and permits to occupy that are for primary production purposes (Category 11.2 leases).

The calculation has reduced the rental from 1.5 per cent of the current unimproved value down to 0.75pc.

Many landholders will take advantage of this saving to pay for the costs of conversion to freehold title. The hottest topic at many landholder forums has been the changes to rules relating to the conversion of leasehold land to freehold land.

The purchase price of freehold title on Category 11 (primary production) leases has been reduced by using a new calculation method known as the Net Present Value of Revenue calculator.

The government is encouraging landholders to take up the offer of freehold title by reducing the conversion price and by contacting all perpetual lease landholders.

The new freehold rate is also applicable to all eligible Category 11 leases including term leases, special leases and pastoral holdings over state land.

Leases issued over roads, reserves, state forests, national parks, timber reserves and regional parks cannot be converted to freehold through this process because they are deemed to have a different primary use.

The new calculation method for freehold land is complicated. Landholders can get an idea of the price by multiplying their prescribed annual land rent (rent a landholder would pay if there were no capping, rebate or deferral arrangement) by 13. Using the calculator, the purchase price of a property with an unimproved value of $485,000 would now be $95,302 as opposed to $485,000.

This example demonstrates that there is a significant saving in purchase price. The government hopes leaseholders will take advantage of this saving to offset other costs that may be associated with a conversion to freehold such as addressing native title, survey costs or purchasing the rights to commercial timber.

There are other changes to rural land administration including the rules relating to subdivision, buying and selling leases which also offer more flexibility and security.

If you would like to know more about these changes or any of the information above, call in to the nearest Department of Natural Resources and Mines (DNRM) business centre, call 13GGOV (13 74 68) or visit DNRM at www.dnrm.qld.gov.au.

Contact your Queensland Country Life Representative for further details.
PRODUCERS facing drought conditions or responding to difficult market circumstances are making good use of farm finance and drought concessional loans of up to $1 million available through QRAA.

Based on current approvals, producers could be realising a benefit of up to $150,000 over the five-year concessional loan term ($20,000 to $30,000 per year).

More than $80 million has been approved under the schemes to date, with 68 per cent ($55 million) of loans being approved to beef production enterprises. Thirty-four per cent of all loans have been approved for producers located in central Queensland with these enterprises benefiting from nearly $28 million in loans.

With the Bureau of Meteorology forecasting drier than average conditions to continue until the end of 2014, interest in and uptake of drought concessional loans continues to increase. QRAA client Jeff Coy explained how his farm business has benefited from the financial assistance available through QRAA.

“We have a long association with QRAA and we have found them to be always helpful and easy to deal with. “QRAA has been excellent to deal with and a client liaison officer visited on-farm to assess our situation, giving us a better perspective on what we are doing and what we are going through. “The farm finance concessional loan has taken some stress out of life and will enable us to look into replacing some of our machinery down the track.”

Longstanding QRAA client Andrea Stewart weighed in on how receiving a loan under the Drought Concessional Loans Scheme had assisted.

“We have a long association with QRAA and we have found them to be always helpful and easy to deal with,” Mrs Stewart said. “The Drought Concessional Loans Scheme is helping us to continue on from difficult times, as well as lessening the burden of our interest bill. QRAA are not only a huge help financially but also psychologically. They have a strong rural sense and an understanding of what we are going through.”

It is important for producers not to self-assess their eligibility for a loan. QRAA has client liaison officers based in Rockhampton, Mackay and Emerald who are available to visit producers on-farm to explore how the eligibility criteria may apply to a producer’s individual situation and help with the application process.

A number of temporary offices are scheduled in November and December. QRAA customer relations staff are also available to assist on Freecall 1800 623 946 or via email: contact_us@qraa.qld.gov.au.

Drought and farm finance concessional loans schemes are funded by the Australian government and delivered by QRAA.

For more information on eligibility criteria, loan conditions and how to apply, visit www.qraa.qld.gov.au or Freecall 1800 623 946.
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CONTACT: Byrony Daniels
4983 7459 / 0427 746 434
Spelling strategies for the recovery of pasture condition

Updated research data from the Monteagle and Wambiana sites

SUMMARY
THE Spelling Strategies Research Project now has four years of information from the Monteagle site, and five years from Wambiana. Spelling has given a small improvement in the crown cover of desert bluegrass but only under moderate stocking rate. Land condition and pasture composition have been stable whether spelled or grazed so far. Under high stocking rate, end of wet season pasture yields are increased with spelling. There has been very little effect from spelling under moderate or high stocking rates, and land condition improvement will take many years. Seedling establishment of 3P grasses happens episodically, and is necessary to drive land condition improvement. Spelling to improve land condition will take many years and must be in synergy with the best management practices: stocking to long-term carrying capacity; managing stock numbers for the feed available in a risk-adverse manner; and managing for even grazing distribution through burning and infrastructure development.

BACKGROUND
Wet season spelling of grazing land is a key recommendation for improving land condition. However, there is little reliable and relevant information on which to guide the design of cost-effective and practical regimes of wet season spelling. This project is improving the evidence base and modelling capacity underpinning recommendations for use of wet season spelling to recover poor condition grazing land and design more reliable spelling options for producers.

RESULTS SO FAR
Monteagle
Monteagle has had variable rainfall over the previous decade, with predominantly dry or very dry conditions. Good growing conditions, prior to and during the first summer, and for the second summer of recordings resulted in high pasture yields and crown cover. The third year of the trial was very dry with a mild drought through the trial paddock in November 2012 and very dry conditions. At Wambiana, the research is conducted under a moderate or a high stocking rate. Improvement in land condition can take many years and/or be episodic and difficult to detect.

Spelling is a key management strategy to improve land condition, however, the poorer the land condition the greater the duration and frequency of spelling needed. The spelling research is beginning to show small improvements in the key pasture parameter – crown cover of desert bluegrass. Desert bluegrass is an important 3P grass across much of northern Australia, and is a cornerstone of productivity and sustainability. Spelling to improve land condition will take many years and must be in synergy with the best management practices: stocking to long-term carrying capacity; managing stock numbers for the feed available in a risk-adverse manner; and managing for even grazing distribution through burning and infrastructure development.

Cattle ticks and tick fever management strategies: the facts from Queensland's cattle industry that significantly reduce cattle liveweight gain and milk production and can transfer tick fever. With significant numbers of producers not undertaking tick control there are opportunities to improve the effectiveness of tick control programs and can the amount of treatment be reduced?

BEEF BREEDS
In the 1970s the composition of the Queensland cattle herd changed significantly as Bos indicus breeds and crosses replaced British breeds. The change was most pronounced in the tick-infested areas of Queensland. Introducing Bos indicus cattle was a major development as it reduced the impact of ticks and the need for tick control treatments. European breeds were also introduced in the 1970s and have been used extensively in crossbreeding with Bos indicus cattle. In the last decade many producers have reduced the Bos indicus content of their herds. This is due to increased crossbreeding and composite breeding and demands...
Spelling has given a small improvement in the crown cover of desert bluegrass when compared to continuous grazing at moderate stocking rate, at both sites.

The most recent research

from some store and slaughter cattle markets for lower Bos indicus content cattle. Reduced Bos indicus content increases the susceptibility of herds to ticks and increases the risk of tick fever.

Survey results showed that Bos indicus bulls are still the predominant breed of bull (Figure 3). Mackay

Whitsunday data for bull breeds was not included as it was incomplete.

TICK FEVER VACCINE

Despite tick fever vaccination of weaners being a long-standing recommendation for tick-affected regions, vaccination rates were low in the Burnett Mary (40%), Fitzroy (32%) and Burdekin (23%) (Figure 3). None of the properties surveyed in the Mackay Whitsunday region vaccinated weaners for tick fever but this could reflect the small sample size.

Calfes raised in tick endemic areas that are exposed to tick fever organisms (Babesia bovis, Babesia bigemina and Anaplasma marginale) between three and nine months of age rarely show symptoms and develop a strong, long-lasting immunity. It is the commonly held belief that cattle born and raised in tick endemic country are immune to tick fever; and it is common not to vaccinate homebred stock, but only vaccinate introduced stock.

However, the percentage of calves exposed to all three tick fever organisms is not high and varies from year to year. So a proportion of calves may remain susceptible to one or more types of tick fever. These calves can die if exposed to tick fever organisms once their calfhood resistance wanes.

Most outbreaks occur in non-vaccinated homebred stock and the most common animals affected are aged 18-36 months, which includes young steers and replacement heifers. In most situations vaccinating young stock with tick fever vaccine prevents outbreaks and deaths. All cattle raised in tick free areas are susceptible to tick fever if introduced into tick endemic areas.

Both vaccines protect against all three tick fever organisms. The chlirfed vaccine is the most commonly used as it is conveniently delivered ready to use. However it only has a four day shelf life so you need to plan carefully before ordering it. It can be delivered to most places within 24 hours.

Efficiency of pasture use and preventing patch grazing can be managed by promoting evenness of pasture use. The selective grazing behaviour of cattle can never be completely controlled. However, fencing to land type, burning and spelling will help improve evenness of pasture use.

Recent research does not support the view that intensively managed multi-paddock grazing systems will deliver improved land condition or cattle production. The aforementioned best management practices will largely achieve acceptable outcomes regardless of the grazing system applied. Wet season spelling will always be a key strategy for maintenance or improvement of land condition, despite there being very few evidence to draw on. Spawning rate management is of primary importance and there are increasing recommendations that stocking rates can only be marginaly increased (-10pc) when subject to a wet season spelling system. Wet season spelling is a key management strategy to allow recovery of overgrazed patches and land types.

Paul Jones
Senior Scientist
(07) 4983 7415

For more remote areas, the frozen vaccine is a better alternative. It is shipped and stored in liquid nitrogen, has a long shelf life and can be stored on site until ready to use. It is preferable where large numbers of animals are to be vaccinated over several days or weeks, and overnight delivery of chilled vaccine is difficult.

Frozen vaccine can be thawed out and used as required, but it must be used within eight hours of thawing. Tick fever vaccination does not mean you can forget about tick control. It is still worth keeping ticks under control to avoid heavy burdens establishing, especially in introduced cattle as this prevents condition and livestock loss, anaemia and death as well as preventing the potential for the transmission of tick fever.

Tick fever vaccines can be ordered through the Tick Fever Centre (07 3898 9655), your local veterinarian or rural agency by phone or fax.

Emily Bates, DAF, Rockhampton
Phone: (07) 4983 6226
Email: emily.bates@daf.qld.gov.au
Wet season spelling: a producer case study site

Oakland site adds to research from Clermont and Charters Towers

BACKGROUND

Wet season spelling of grazing land has long been considered a key recommendation in improving land condition to benefit sustainability, production and profit in agriculture. The spelling strategies project aims to improve the evidence base and modelling capacity unpinning such recommendations.

CASE STUDY SITE - OAKLANDS

In addition to two research sites at Clermont and Charters Towers, a producer case study site has been established on the Oaklands property 80km south of Duaringa, owned by the Dunne family, in central Queensland.

Primarily a Climate Clever Beef Project focusing on integrating carbon farming practices into beef businesses, the pastures are being monitored to add further understanding to the effect of wet season spelling on poplar box woodland to achieve land condition maintenance and/or improvement. Data has been recorded for two wet seasons at this site.

Four treatments are being measured, with each vegetation type subject to two grazing treatments – continuously grazed and wet-season spelled. The treatments include:

- Remnant box woodland (RemnGraz or RemnSpel)
- 10 year old box regrowth (SuckGraz or SuckSpel)
- Recently cleared 10 year old regrowth (ClearGraz or ClearSpel)
- Completely cleared with Graslan herbicide (GraslGraz or GraslSpel).

RESULTS SO FAR

The 2012/13 wet season resulted in increased pasture yields across all treatments. This appeared to be an increase in pasture yield in spelled treatments compared with those grazed, however this was not consistent across all treatments and is not a strong effect (Figure 1).

Spelling lifted pasture yield in the Graslan-cleared and 10-year-old regrowth treatments compared with those grazed, while the remnant and cleared regrowth treatments did not. Ground cover was high across all treatments and did not change, however crown cover appeared to increase under spelling compared to grazing.

Pasture yields increased over the 2013/14 wet season however were reduced compared with the previous summer. The remnant treatments were the exception with tree competition probably limiting pasture growth. The Graslan-cleared treatments were burnt in November 2013, which resulted in reduced pasture yield, ground cover and crown cover. Spelling appears to have improved pasture yield for the cleared, regrowth and Graslan-cleared treatments. Land condition is generally poor across all treatments, however the cleared treatment appears to be improving.

DISCUSSION

The 2012/13 wet season was wetter than average and resulted in good growing conditions. The growing conditions in 2013/14 were poorer with above average rainfall following a long dry period mid-summer. The Graslan-cleared treatments are located in a separate paddock and variation in stocking rates may be confounding the results.

While there appears to be a small increase in pasture yield due to spelling, it is quite variable across all treatments and is not a strong effect. The varying stocking rates across the site may have masked the effects of spelling, while the conservative stocking rate or better starting condition in the Graslan-cleared treatment may have influenced the large increase in pasture yield. Land condition remains poor across all treatments due to a poor pasture composition and low crown cover.

Research conducted under the spelling strategies project at the Clermont property has shown similar results over the 2010/11 and 2011/12 wet seasons. During these good seasons, spelling has had minimal impact on pasture parameters when compared to grazing at a conservative stocking rate. Pasture yield and composition has not changed with spelling, and this is consistent with the Oaklands monitoring.

Carly Harris
Technical officer (grazing systems)
DAFF Emerald
(07) 4983 7420

KEY POINTS

- Spelling has had minimal impact on pasture parameters when compared to grazing at a conservative stocking rate.
- While ground cover is good land condition remains poor across all treatments due to a poor pasture composition and low crown cover.
- Research conducted under the spelling strategies project at the Clermont property has shown similar results.
Water quality: the effects on cattle during dry seasons

Water is often overlooked when calculating dry season and drought rations

When calculating dry season and drought rations the water component is often overlooked. Access to good quality water is essential as it affects feed intake, paddock utilisation, cattle growth rate, lactation and reproduction.

For example, in Central Queensland daily intakes of breeders forced to drink poor quality water during winter dropped as low as 9-12L/head but recovered to 12-15L/head when water quality improved (Entwistle & Jepcott 2005).

This article looks at water quality factors that can adversely affect cattle and other livestock. Some of which, such as cyanobacteria (blue-green algae) and salinity, are exacerbated during extended dry periods and/or high temperatures.

The following information is from the ‘Review of the effects of water quality on ruminant health and productivity prepared by Dr Raj Kurup et al (2011) available from Meat & Livestock Australia. Water issues are vast and complicated but an understanding of the source, climatic conditions, soil type, etc.

The impact of water quality has on cattle varies due to their diet and physiological state. It’s important to be aware that just because you’re in an area known for water quality issues it’s best to get it tested.

Factors that affect water quality include: colour and taste; physical and chemical properties; presence of toxic compounds; concentrations of micro- and macro-nutrients; and, microbial contamination.

Some potential culprits of poor water quality are:

- **pH**
- **Total dissolved solids or electrical conductivity**
- **sodium**
- **calcium**
- **magnesium**
- **nitrate and nitrite**
- **sulphate**
- **heavy metals** (e.g. fluoride)
- **blue green algae**

When calculating dry season and drought rations the water component is often overlooked.

### Livestock

<table>
<thead>
<tr>
<th>Livestock</th>
<th>No adverse effects on animals expected</th>
<th>Animals may have initial reluctance to drink or there may be some scouring, but stock should adapt without loss of production</th>
<th>Losses of production and a decline in animal health and condition would be expected. Stock may tolerate these levels for short periods if introduced gradually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef cattle</td>
<td>0-4000</td>
<td>4000-5000</td>
<td>5000-10,000</td>
</tr>
<tr>
<td>Sheep</td>
<td>0-4000</td>
<td>4000-10,000</td>
<td>10,000-13,000</td>
</tr>
<tr>
<td>Horses</td>
<td>0-4000</td>
<td>4000-6000</td>
<td>6000-7000</td>
</tr>
</tbody>
</table>

* Adapted from ANZECC (1992), * Sheep on lush feed may tolerate up to 13,000mg/L TDS without loss of condition or production.

### TOTAL DISSOLVED SOLIDS

**Total dissolved solids (TDS)** is a measure of all inorganic salts dissolved in water and is a guide to the quality of water. The measurement also includes other dissolved substances such as organic compounds.

### pH LEVEL

pH level is determined by the concentration of hydrogen ions in water. A pH of 7 is ‘neutral’, values less than 7 are increasingly acidic, and values greater than 7 are increasingly alkaline. The optimum pH range for beef cattle is 6.5 to 8.5. For the most part the pH of groundwater across northern Australia is within the acceptable range for cattle.

Alkaline water (pH greater than 8.5) may cause digestive upsets, diarrhoea, poor feed conversion, reduced water and/or feed intake. If the pH is less than 5.5 it is acidic and reduced feed intake may occur (Kurup et al 11).

**SODIUM TOXICITY**

Sodium toxicity is related to the availability of water. If animals can drink excessively good quality water they can increase sodium excretion. However if they can’t drink sufficient good quality water they’ll suffer acute sodium toxicity. Acute sodium toxicity results in dehydration, neurological signs (e.g. blindness, incoordination, convulsions) and death. Acute intoxication of cattle has occurred when they’ve drunk water containing around 5000mg/L of sodium.

**Chronic sodium toxicity in cattle has resulted after drinking water containing 250mg/L of sodium. Cattle suffering from chronic sodium toxicity drink more, have diarrhoea, eat less and produce less milk.**

The ‘safe’ level for sodium depends on the availability of low saline water; feed intake of salt and the metabolic status of the animal, e.g. dry, pregnant, lactating or growing.

*Sodium chloride* toxicity has been reported in animals drinking both surface and ground water. It was suspected in Queensland in 2003 where five year old Merino wethers died from drinking very salty bore water.

They suffered incoordination and recumbency before death. *There have also been reports of animals dying from urinary calculi and obstruction, presumed to be due to the high mineral content of the water* (Kurup et al 2011).

Calcium levels of up to 1000mg/L can be tolerated by cattle. However high levels are less tolerated: dietary phosphorus is inadequate; high concentrations of sodium and magnesium are present, or, if additional calcium is added to the diet in supplements.

High calcium levels can interfere with phosphorus absorption and cause phosphorus deficiency. Although not common, excess calcium can result in skeletal disorders and under some circumstances can be deposited in skeletal and heart muscle, potentially compromising heart function.

Magnesium at high levels such as 5000mg/L have been associated with diarrhoea, lethargy, lameness, decreased feed intake and decreased performance. Nitrate and nitrite occur naturally in waters and can both cause toxicity.

**Nitrate concentrations less than 400mg/L in stock water are unlikely to cause a problem, however nitrate concentrations greater than 30mg/L can be hazardous.**

High levels are usually associated with contamination from fertiliser, manure or other waste material.

**Sulphate is also found in most natural waters. Less than 1000mg/L of sulphate should not cause a problem, however concentrations of 1000-2000mg/L can adversely affect young or lactating animals (e.g. diarrhoea).** It can also be a problem in dry hot weather when cattle drink more. Levels greater than 2000mg/L can cause chronic or acute health problems.

#### Fluoride

Fluoride can be an issue in bore water, concentrations greater than 2mg/L may be hazardous to stock. Because it’s a cumulative toxic animal that live longer are more likely to develop chronic fluorosis. Australia’s National Animal Health Information System reports one case of fluorosis in 2003 affecting three year old Santa Gertrudis cows near Longreach. The cows had generalised lameness, thought to be associated with the high concentrations of fluoride (18mg/L) in the bore water.

**BLUE GREEN ALGAE**

Algae blooms, including blue green algae (cyanobacteria) are more likely to occur:

- in stationary surface water sources with high concentrations of organic material, e.g. manures, run-off from cattle etc.
- during periods of sunny weather with temperatures between 15-30°C, and
- in water with a pH of greater than or equal to 6.

Kurup et al (2011) found that the two most commonly reported cases of poor water quality related livestock deaths in Australia were cyanobacteria poisoning and salt toxicity.

#### MORE INFORMATION

More information about water quality and its effects on cattle, improving water quality and water quality sampling can be found in:

Water quality: How it affects your cattle

Golden rule – if you have any doubts about quality, get it tested

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Total dissolved solids (mg/L)</th>
<th>Loss of production and a decline in animal health and condition would be expected. Stock may tolerate these levels for short periods if introduced gradually.</th>
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*Adapted from ANZEC (1992).*

When calculating dry season and drought rations the water component is often overlooked. Access to good quality water is essential as it affects feed intake, paddock utilisation, cattle growth rate, lactation and reproduction.

For example, in Central Queensland daily intakes of breakers forced to drink poor quality water during winter dropped as low as 9-12L/head but recovered to about 25L/head when water quality improved (Ewart et al 2005).

In BeefTalk 37 (p20) we looked at how much cattle eat and drink. This article looks at water quality factors that can adversely affect cattle and other livestock.

Some of which, such as cyanobacteria (blue green algae) and salinity, are exacerbated during extended dry periods and/or high temperatures.

The following information is from the ‘Review of the effects of water quality on ruminant health and productivity’ prepared by Dr Raj Kurup et al (2011), available from Meat and Livestock Australia.

Water quality varies depending on the source, climatic conditions, soil type, etc. The degree of impact water quality has on cattle varies due to their diet and productive conditions, soil type, etc. The degree of impact water quality has on cattle varies due to their diet and productive conditions.

Some potential culprits of poor water quality are:

- **pH**
- **Total dissolved solids or electrical conductivity,** including:
  - **Sodium**
  - **Chloride**
  - **Magnesium**
  - **Sulphate**
  - **Nitrate and nitrite**
  - **Calcium**

**TOTAL DISSOLVED SOLIDS**

Total dissolved solids (TDS) is a measure of all inorganic salts dissolved in water and is a guide to water quality. The measure also includes other dissolved substances such as organic compounds, when present. The TDS of natural waters reflects the geology of source areas; the major contributing ions include:

- Sodium
- Chloride
- Magnesium
- Sulphate
- Nitrate and nitrite
- Calcium
- Heavy metals (e.g. fluoride)
- Bicarbonate and carbonate

**TOLERANCES TO TOTAL DISSOLVED SOLIDS (SALINITY) IN DRINKING WATER**

<table>
<thead>
<tr>
<th>Livestock</th>
<th>TDS (mg/L)</th>
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<tbody>
<tr>
<td>Beef cattle</td>
<td>0-4000</td>
<td>No adverse effects on animals expected</td>
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*Adapted from ANZECC (1992).*

**BLUE GREEN ALGAE**

Algae blooms, including blue green algae (cyanobacteria) are more likely to occur:

- In stationary surface water sources with high concentrations of nutrients, for example, run-off from fertilised pastures.
- During periods of sunny weather with temperatures between 35-38°C (95-100°F).
- In water with a pH of greater than or equal to 6.

Kurup et al (2011) found the two most commonly reported causes of water quality related livestock deaths in Australia were cyanobacteria poisoning and salinity toxicity.

More information about water quality and its effects on cattle, improving water quality and water quality sampling can be found in:


Associated with cyanobacteria, this is caused by the high mineral content of the water. It was suspected in Queensland in 2003 where five-year-old Merino wethers died from drinking very salty bore water. They suffered incoordination and recumbency before death. There have also been reports of animals dying from urinary calculi and obstruction, presumed to be due to the high mineral content of the water (Kurup et al 2011).

Calcium levels up to 1000mg/L can be tolerated by cattle. However, high levels are less tolerated if dietary phosphorus is inadequate; high concentrations of magnesium are present; or if additional calcium is added to the diet in supplements. High calcium levels can interfere with phosphorus absorption and cause phosphorus deficiency. Although not common, excess calcium can result in skeletal disorders and some circumstances can be deposited in skeletal and heart muscle, potentially compromising heart function.

Magnesium at high levels such as 5000mg/L have been associated with diarrhoea, lethargy, lameness, decreased feed intake and decreased performance. Nitrate and nitrite occur naturally in waters and both can cause toxicity. Nitrate concentrations less than 400mg/L in stock water are unlikely to cause a problem, but nitrite concentrations greater than 30mg/L can be hazardous. High levels are usually associated with contamination from fertiliser, manure or other waste material.

Sulphate is also found in most natural waters. Less than 1000mg/L of sulphate should not cause a problem, but concentrations of 1000-3000mg/L can adversely affect young or lactating animals (for example, diarrhoea). It can also be a problem in dry hot weather when cattle drink more. Levels greater than 2000mg/L can cause chronic or acute health problems.

Fluoride can be an issue in bore water, concentrations greater than 2mg/L may be hazardous to stock. Because it is a cumulative toxin, animals that live longer are more likely to develop chronic fluorosis. Australia’s National Animal Health Information System reports one case of fluorosis in 2003 affecting three-year-old Santa Gertrudis cows near Longreach. The cows had generalised lameness, thought to be associated with the high concentrations of fluoride (18mg/L) in the bore water.

Even if the salinity or TDS is within limits, specific ions can cause health problems. Where TDS exceeds 4000mg/L it is advisable to do a detailed analysis of the ground water. TDS concentration in water can increase through evaporation.

**SODIUM TOXICITY**

Sodium toxicity is related to the availability of water. If animals can drink enough good quality water they will not cause sodium excretion. However, if they cannot drink sufficient good quality water they will suffer acute sodium toxicity. Acute sodium toxicity results in dehydration, neurological signs (for example, blindness, incoordination, convulsions) and death. Acute intoxication of cattle has occurred when they have drunk water containing about or over 5000mg/L of sodium.

Chronic sodium toxicity in cattle has resulted after drinking water containing 2500mg/L of sodium. Cattle suffering from chronic sodium toxicity drink more, have diarrhoea, eat less and produce less milk. The ‘safe level’ for sodium depends on the availability of low salinity water, feed intake of salt and the metabolic state of the animal, for example, dry, pregnant, lactating or growing.

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