



Northern muster

Information for rural business in north Queensland

Producing quality food and
fibre for a healthy bottom line

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Issue 28 August 2011

editorial

Welcome to the 2011 winter edition of the *Northern Muster*. Dry season activities are well under way with weaning, selling cattle and dry season supplements all happening.

In this issue, we welcome and introduce new staff to the region. We also say farewell to some staff as well. Bill Holmes, our beef economist, who is known to many producers, has retired. A number of us hope to have some limited continuing contact with Bill. We wish him well in his retirement. Heather Lees has been behind the scenes for several years desktopping the *Northern Muster*. Heather has retired and we wish her well in her retirement where travel is part of the plan. Tonia Grundy has also had an important contribution in the production over the last few years. Tonia and her family are moving to Toowoomba. We wish them all the best for their new challenges. All three will be greatly missed and I would like to thank them for their support and contributions over the years.

Enjoy the reading in this jam-packed issue and please fill in the *Feedback Sheet* and send it in. Tell us what topics you would like included in future editions.

Alan Laing
Editor



Queensland Government

Farewell to DEEDI

Bill Holmes Principal Agricultural Economist (Retired)

By the time this issue of *Muster* goes to print, I will have retired. My last day with DEEDI is 30 June 2011. I will however be continuing in a limited capacity as a 'volunteer' in the Animal Science part of DEEDI. This is to look after user enquiries on Breedcow and Dynama software. I will also be providing input to a new project to rewrite Breedcow and Dynama on a new platform.

For the time being the email address bill.holmes@deedi.qld.gov.au and the mobile phone 0419646919 will continue to function.

This departure is after nearly 37 years with DPI/DPIF/DEEDI, and seven years with NSW Department of Agriculture at Tamworth before that.

At Tamworth I worked on cropping, machinery, taxation, chooks, dairy, pigs, grazing and farm surveys. My sense of culture and ethos however, were with open spaces and extensive grazing, so when the opportunity came I moved to Charleville with DPI, and from there to Townsville in 1986.

My rural roots run deep—the first of the Holmes clan came to the Hunter Valley in NSW in 1842 where they had wineries and cattle. The main place there was *The Wilderness* at Pokolbin. That was before wine-making became trendy. Great grandfather worked most of his life for Henry Dangar and managed *Yallaroi* near Warialda. It ran about 10 000 cattle then. On his retirement in the 1890s he bought *Bullerana*, 6000 ha in the Moree Watercourse. That stayed in the family

Issue 27 erratum

Page 14 incorrectly referred to *Carissa ovata* as current bush. The correct spelling is currant bush.

until my cousin sold it. Now it grows cotton. My own family had a sheep place at Collarenebri. Other bits of the family way back had places in the Gulf and elsewhere (Hungerfords) and helped set up AA Coy.

My work interests have ranged across options analysis (testing the profitability of change), financial counselling (when the regional economists still did that stuff), property surveys and benchmarking, running training workshops, newsletter editing, and writing and using decision support software.

My ongoing interests will include getting out into the bush. In the past 20 years or so I have developed an interest in birding ('finding' rather than 'watching'), which adds value to another bush interest—shooting pigs. The combined activity I refer to as 'armed birdwatching', which causes some consternation amongst mainstream birders.

I do intend also to do some limited professional work in a private capacity, mostly things that I can do with the Breedcow and Dynama software, so I am not finished with the beef industry yet.

My wife, of course, has an alternate retirement program mapped out for me.

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If you know of anyone who would like to receive the Northern muster drop us a note at:

DEEDI
PO Box 15
Ayr Qld 4807

Ph: 07 4720 5100
Fax: 07 4720 5198
Email: Alan.Laing@deedi.qld.gov.au

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Burdekin extension position appointments

The following five new beef extension staff have been appointed to work within the Futurebeef teams servicing the Burdekin catchment.

Megan Debney

**Beef Extension Officer,
Charters Towers**

Megan grew up on cattle properties in Queensland and Northern Territory, spending most of her school years at Glenormiston, near Boulia. After boarding school in Toowoomba, Megan spent a number of years working on cattle properties in North West Queensland. During this time she completed a Bachelor of Applied Science (Animal Studies) externally through University of Queensland Gatton. Megan commenced work with DEEDI as a Technical Officer at Swans Lagoon Research Station, Ayr, in 2004.

From there she moved to Charleville, and then Winton, as a biosecurity inspector. For the last five years Megan has been a biosecurity inspector in Mount Isa. During this time she has worked in other centres and was involved in the equine influenza and Hendra virus outbreaks.

Megan has been active in Mt Isa community events, including the campdraft. She has completed a Graduate Diploma in Legal Studies and is undertaking further legal studies. She is looking forward to the opportunities and challenges of the beef extension position at Charters Towers.



Olivia Pisani

**Beef Extension Officer,
Charters Towers**

Olivia is currently living at Woodberry in the Hunter Valley but has lived all over Australia including Townsville, as her father is in the Air Force. She also lived in Indonesia for a year.

In 2006, Olivia completed a Certificate IV and Diploma in Agriculture at CB Alexander Agricultural College, Tocal. She enrolled in a dual Agriculture/Law degree at University of New England in 2008 and she will complete the Bachelor of Agriculture in November 2011.

Olivia is a keen horsewoman and competes in eventing, dressage and showjumping. She is looking forward



to applying her studies and developing a role in the beef industry through the beef extension position at Charters Towers.

Lauren Williams

**Beef Extension Officer,
Mackay**

Lauren grew up on the Northern Beaches of NSW and has pursued her interest in agriculture by obtaining a Degree in Equine Business Management and a Masters Degree in Animal Science through the University of Sydney.

Lauren majored in ruminant nutrition, extensive livestock husbandry and animal behaviour. She has developed an interest in the use of modern technologies (e.g. GPS) in animal production.

For the past three years Lauren has worked in livestock insurance, with particular involvement in imports/exports and infertility. Lauren sees the beef extension officer role as an excellent opportunity to work in the beef industry and contribute to its development.



Laura Devlin

**Beef Extension Officer,
Emerald**

Laura grew up on a cattle property outside Wandoan in Queensland. After boarding school in Toowoomba she worked on a cattle ranch in Canada for six months to experience the beef cattle industry in another country. This ranch also had a tourism business and Laura assisted with trail rides and hunting trips.

In 2010, Laura graduated from University of Queensland Gatton Campus with a Bachelor of Agricultural Science, majoring in Rural Technology. A highlight of her course was a semester-long internship with the Northern Territory Pastoral Production teams in Tennant Creek and Alice Springs.

Laura undertook her fourth year project on bull breeding soundness examinations (BBSE) and worked with John Bertram and Michael McGowan. For recreation Laura enjoys a range of sports including netball, touch football, athletics, horse riding and gymnastics. She is looking forward to developing her career and skills in the agricultural industry.



Timothy Moravek **Agri-economist, Charters Towers**

Tim grew up on a small crop farm outside Gympie before moving to North Queensland, living for a while in the Burdekin and then Townsville. Tim completed a Bachelor of Economics through James Cook University and is currently undertaking a Masters of Professional Accounting.



For the past two years, Tim has worked for Queensland Health throughout North Queensland implementing disease control programs. He is looking forward to applying his economic knowledge and sees the agri-economist position at Charters Towers as an excellent opportunity to develop a role in the beef industry.

Megan Debney, Olivia Pisani and Timothy Moravek

Ph 07 4761 5150

Lauren Williams Ph 07 4967 0724

Laura Devlin Ph 07 4983 0700

Grazing BMP on track for late 2011 industry launch

Planning for Grazing BMP (Best Management Practice) pilot workshops across Queensland is advancing and cattle producers should be involved in operational projects toward the end of 2011.

Department of Employment, Economic Development and Innovation (DEEDI) Agri-Science Queensland industry development officer, Lindy Symes, is leading the Grazing BMP project, aimed at developing voluntary best management grazing practices. The two-year pilot project is modelled on the successful Grains BMP project, and is rapidly gaining momentum.

Initial support for the Grazing BMP project has been progressed by the Fitzroy Basin Association through funding from the Reef Rescue component of the Australian Government's Caring for Our Country funding with further support from AgForce and DEEDI. Now there is interest from Meat and Livestock Australia for the Grazing BMP project to link with existing industry quality assurance systems.

A Grazing BMP Landholder Reference Group, with representatives from grazing businesses in the Fitzroy, Burdekin and Burnett–Mary River catchments, has commenced. The group has the charter to develop self-assessment modules to enable cattle producers to monitor and accurately benchmark their own management practices and identify knowledge or training gaps in their businesses.

Based on a whole-of-business focus and industry supply chain, discussions are exploring potential market drivers for beef practices that clearly demonstrate environmental stewardship.

Queensland's cattle industry is the only major agricultural industry without a BMP program. Such a program will ultimately allow producers to

effectively manage and report on their environmental performance.

By collating recommended management practices, the cattle industry would have an industry scorecard to demonstrate to the wider community documented, good land management and environmental stewardship.

Graziers will be able to benchmark with other grazing businesses, both within their catchment and across the state, based on best management principles set at three levels—above, minimum and below standard. There is also scope to benchmark industries for mixed farming enterprises.

Through the Grazing BMP data, industry would be able to monitor the adoption of beef production and land management research, which is often funded through industry levies, as well as identify any shortfalls in the provision of extension and training.

The industry overview aggregated from graziers' responses should allow better targeting of incentive funding made available through natural resource management groups.

GRAZING BMP project leader, Lindy Symes, DEEDI, Biloela, says cattle producers should have access to the voluntary self-assessment grazing management modules in late 2011.

Lindy Symes

DEEDI, Biloela

Ph 4992 9178 or 0428 104 248

Lindy.Symes@deedi.qld.gov.au

Mick Sullivan

DEEDI, Rockhampton

Ph 4936 0239 or 0428 104 374

Mick.Sullivan@deedi.qld.gov.au



Better beef business training courses and workshops

Identifying opportunities

In this time of increasing change and climate challenges, FutureBeef training courses and workshops provide a chance to review critical aspects of your beef business and identify opportunities to strengthen its performance and sustainability.

We offer a range of workshops covering animal nutrition, sustainable grazing, reproduction and genetics, and business management across North Queensland. These workshops have been developed in collaboration with producers to provide practical information, tools and skills to apply on-property. They consider the whole business and are tailored to meet specific group and regional issues.

Workshops we deliver include:

- Nutrition EDGE
- Grazing Land Management EDGE
- StockTake: balancing supply and demand
- Artificial Insemination
- Breeding EDGE
- Breeding for Profit
- Business EDGE
- Managing for Climate & Weather
- Herd Management
- Bull Selection
- Pregnancy Diagnosis
- Better Decisions in the Business of Beef
- Testing Management Options

The EDGENetwork® is an education and information initiative of Meat & Livestock Australia, designed to benefit livestock producers and the wider industry. Contact 1800 993 343 or visit www.mla.com.au/edge

Nutrition EDGE

This three-day interactive, practical workshop covers all aspects of animal nutrition, including how nutrition affects animal growth rates, financial returns and market access. You will learn what nutrition and supplements are required to improve the health and growth of your stock, and to assess the level of nutrition provided by your pastures.

The Nutrition EDGE workshop helps you to:

- determine the nutritional requirements of your livestock
- estimate the feed value of your pasture and the production of your livestock

- find the balance between your pasture growth, pasture use and animal production
- make management decisions that consider different seasonal conditions
- know what supplements to feed
- save money on supplementary and drought feeding
- understand a feed product label and know what questions to ask feed companies.

Cost \$1620 plus GST (\$230 plus GST for the second person from the same business). FarmReady-approved (FRTC 00487).

Grazing Land Management EDGE

Grazing Land Management (GLM) workshops provide land managers with a practical and planned approach to improving productivity and sustainability. The workshops start by looking at grazing lands as ecosystems and how they function. The full range of management options for improving ecosystem processes, and thus improving production, grazing land condition and the business's bottom line are considered throughout the workshop. The workshop concludes with a property planning session.

Held over three days, GLM workshops provide information that includes long-term stocking rate calculations, forage budgeting, land condition assessment and information on sown pastures, fire and weeds specific to the land types. The climate and production systems of specific regions is also considered. The informal structure of the workshop encourages discussion and debate, as well as opportunities to share land management experiences.

Cost \$1620 plus GST (\$230 plus GST for the second person from the same business). FarmReady approved (FRTC 00317).

StockTake: Balancing Supply and Demand

This one-day practical training workshop steps you through the concepts of, and how to monitor, land condition and demonstrates field assessment techniques using a database. It is a monitoring package that 'takes stock' of your grazing resources and identifies points to improve management decisions. At the end of the day you will be able to:

- conduct paddock-scale assessment of land condition and pasture yields
- manage and interpret data for business planning
- quantify the potential for improvement in productivity
- complete forage budgets to determine how long feed is going to last with the present number of cattle in the paddock.

Cost \$300 plus GST (the second person from the same business is free). FarmReady approved (FRTC 00272).

Artificial Insemination

The course covers all aspects of AI training, including anatomy and physiology, heat detection and synchronisation, program planning, semen handling, and the care, purchase and maintenance of liquid nitrogen units. At the end of the four-day course, you will have the necessary skills to conduct AI programs on your herd. A one-day refresher course is also available.

Cost \$1415 (GST inclusive).

Breeding EDGE

This three-day interactive workshop and practical session covers all aspect of reproduction and genetics. During the workshop you will develop a breeding strategy for your property. A follow-up day is also offered to fine-tune this strategy.

This EDGenetwork® workshop will help you to:

- keep, and improve, the desirable traits in your herd
- capitalise on genetic gains
- effectively manage your breeding herd
- meet market specifications and maximise returns
- evaluate the success of your strategies and management.

Cost \$1620 plus GST (\$230 plus GST for the second person from the same business). FarmReady approved (FRTC 00488).

Breeding for Profit

This one-day interactive, practical workshop analyses the advantages and disadvantages of crossbreeding. You will learn how to:

- select bulls with desirable genetics for a target market
- segment the beef market and identify a target market
- assess the current performance of your business
- evaluate breeding program options.

Cost \$300 plus GST (the second and third persons from the same business are free).

Business EDGE

This two-day workshop will provide a lead for beef producers who want to improve the financial resilience of their business by fine-tuning their business skills. Specifically the workshop will cover:

- what information really matters
- interpretation of critical numbers in business accounts
- the key profit drivers (business and herd) and how to improve them
- the allocation of capital
- spreadsheet tools to help you
- follow-up professional advice.

Cost \$1850 per business (two people) + \$200 per extra person. \$925 if only one person attends. FarmReady approval pending.

Managing for Climate & Weather

This one-day practical workshop provides graziers with the tools to understand:

- weather and climate systems including the Southern Oscillation Index (SOI)
- weather maps
- rainfall probabilities and green dates
- how storms, cyclones and other local weather systems form and affect weather.

Cost to be determined.

Herd Management

This workshop provides participants with the skills to evaluate the performance of a beef herd. It involves:

- considering ways that herd performance can be measured
- calculating important measurements for the herd
- considering methods and setting goals to make the herd work harder to achieve business and personal goals
- an indication of how well the herd is performing
- measuring change over time
- measuring progress towards achieving herd performance goals
- identifying strengths of current management
- identifying opportunities to improve
- identifying weaknesses of current management.

Cost to be determined.

Bull Selection

This one-day hands-on workshop shows you how to improve your breeding program by evaluating the genetics of your bulls and their ability to serve and reproduce. The workshop also examines the technology that can impact on your herd's genetics.

Cost \$300 plus GST (the second and third persons from the same business are free).

Pregnancy Diagnosis

This three-day course provides you with the necessary skills to manually test animals for pregnancy (not for others for payment). You will be able to apply your knowledge and skills using an analytical approach to examine a range of factors in diagnosing pregnancy. Pregnancy testing may be used as a diagnostic tool as an integral part of a breeding program or where there is a need to accurately establish pregnancy or absence of pregnancy for other purposes such as culling, drying off or prior to the live export of animals.

Cost \$1045 GST inclusive.

Better Decisions in the Business of Beef

This two-day workshop will show you how to do standard farm business management budgeting and project assessment using Breedcow and Dynama software. You will learn how to:

- compare prospective, stable-state profit from different turnoff choices, husbandry systems or grazing intensities
- estimate future profit, cash flow, indebtedness and net worth based on herd projections under various scenarios, including pasture spelling for land condition improvement
- compare scenarios using discounted cash flow analysis to demonstrate return on investment
- compare store purchase options for pasture fattening or backgrounding
- compare forced sales options for drought or cash relief.

Cost \$1000 plus GST. FarmReady approved (FRTC 00213).

Testing Management Options

Are you interested in determining the economics of your grazing enterprise? Would you like to know the profitability of your whole-farm system? If you were to change your farming system, would you be better off?

This one-day workshop uses a simple whole-farm process to assess the profitability of different enterprise and management options such as:

- breeding cattle vs. trading
- selling to feedlots vs. growing Japanese ox
- buying more land
- supplementary feeding.

Cost \$300 plus GST (the second and third persons from the same business pay half price). FarmReady approved (FRTC 00397).

Contract training

Our training courses and workshops can also be delivered on a contract basis (price on application).

Custom-made workshops, field- or information-days can also be developed and delivered to meet specific industry, organisation or group needs.

Examples of these types of activities include:

- BREEDPLAN: beef cattle recording and selection
 - Buffel Rundown
 - Climate, Carbon and your Property
 - Managing your Livestock Business Through Drought
 - Weed Identification and Management
-

More information

If you would like more information or to register your interest in attending a workshop please contact your local FutureBeef officers at:

- | | |
|-------------------|--------------|
| • Ayr | ph 4720 5100 |
| • Bowen | ph 4761 4000 |
| • Charters Towers | ph 4761 5150 |
| • Cloncurry | ph 4742 1311 |
| • Kairi | ph 4091 9402 |
| • Townsville | ph 4760 1600 |

Or email the beef team at beef@deedi.qld.gov.au, phone the Business Information Centre on 13 25 23 or visit our website, at www.deedi.qld.gov.au

FarmReady reimbursement grants

FarmReady is the Australian Government's \$26.5 million program that boosts training and provides opportunities for industry, farming and natural resource management groups to develop strategies to adapt and respond to climate change. The four-year program offers up to \$1500 to cover course fees each financial year, with funding available to cover excess travel, accommodation and childcare costs.

To be eligible for the FarmReady reimbursement grant, you must be at least one of the following:

- a primary producer (a farmer, fisher or forester)
- an immediate family member of a primary producer
- a member of a management team of a primary production enterprise
- an indigenous land manager.

To find out more about FarmReady-approved courses, or to check your eligibility visit www.farmready.gov.au or phone the administrator on 1800 087 670.

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Tick fever: assessing the risk with increasing tick numbers

Should we vaccinate against tick fever? This is the question being posed by some producers who have been affected by the recent expansion of cattle ticks after the big wet season. This involves not only producers who have recently acquired cattle ticks and those whose risk has increased because neighbours are now infested; but also properties which are normally 'ticky', and where tick numbers have increased substantially this season.

These important reminders about the lifecycle of the tick fever organisms (*Babesia* and *Anaplasma*), and the way they are spread, help define the risk:

- Cattle ticks spread tick fever; so if ticks are present, there is some risk.
- Most calves show an age-related resistance that stays with the animal until about nine months of age. Calves exposed to tick fever organisms when the age-related resistance is high rarely show clinical symptoms and develop a solid, long-lasting immunity. If this happens to all of your calves, tick fever will not be a problem, but they must be exposed to all three tick fever parasites. If cattle are not exposed to tick fever as calves, the age resistance gradually wanes with time and these animals will become highly susceptible to tick fever.
- *Babesia bovis* is spread by larval (seed) ticks and *Babesia bigemina* by nymphs. When an adult female tick feeds on a beast infected with *Babesia spp*, the *Babesia* organism is passed on through the tick eggs into the larval ticks. When the larval tick attaches, *Babesia bovis* can be transmitted within a few days.
- *Anaplasma* organisms are transmitted directly from an infected animal to a susceptible animal as male ticks transfer between animals in the yards or when cattle are camping together. They do not pass through the eggs and into the larvae.

What then defines the risk?

Previous exposure to ticks and tick fever organisms

Obviously, if the herd has always been tick-free, all animals will be at risk. It is, however, a mistake to think that just because animals have run with ticks at some point that they are immune to tick fever. An engorged female tick can produce more than 3000 seed ticks, but only a very small number of seed ticks (sometimes considerably less than 1 in 1000) will carry the *Babesia* organisms. Because of this, calves do not always become infected (and therefore protected) following exposure to ticks—even though it only takes one infected tick to transmit tick fever. On top of this,

low cattle tick numbers, because of dry seasons and strategic tick control programs, can mean that a significant number of animals may not have been exposed to tick fever infections before they are nine months old and therefore are not naturally immune. This concern is real—low levels of immunity in weaners were verified in survey work across the tick-infested northern shires of Queensland in the mid-90s, with substantial property to property variation.

Breed

The message here is fairly straightforward. Brahman do not often show evidence of disease after infection with *Babesia spp* (babesiosis), but are susceptible to anaplasmosis. *Bos taurus* breeds however are very susceptible to disease after infection with either *Babesia* or *Anaplasma* species. Importantly, work at Tick Fever Centre has shown that exotic *Bos taurus* breeds such as Tuli and Senepol are just as susceptible to tick fever as the more traditional European and British breeds. Crossbred cattle are in-between—more brahman content increases the resistance; more *Bos taurus* content reduces it.

So how do we put this information together?

Scenario 1—A property, which has been tick-free, now has tick infestation

- If it is a high Brahman-content herd with recent introduction of ticks and the cattle have all been raised in a tick-free environment—the risk of babesiosis is small (by virtue of breed) and the risk of anaplasmosis is small (because there should be no *Anaplasma* carriers in the herd).
- If it is a high Brahman-content herd with recent introduction of ticks and cattle that have previously been exposed to ticks (e.g. strays, other introductions, including bulls) are running on the property—the risk of babesiosis is small (by virtue of breed) but the risk of anaplasmosis is substantial. There could be *Anaplasma* carriers in the herd, which are a source of organisms to transmit via the male tick to other susceptible animals.
- If the Brahman content is lower than in either of the above situations, then risk of babesiosis (derived from infected tick larvae on the pasture) increases substantially and the risk of anaplasmosis is also substantial if there is a chance of direct contact with carrier animals.

Scenario 2—A property, which has had ticks for some time, now has much greater tick numbers

- It is a risk in itself to assume that the cattle will be immune, simply because they have been running on a tick-infested property. The increase in risk of a tick fever outbreak will largely depend on the breed–disease interaction. The risk of babesiosis will not change much in a Brahman

herd, but the risk of anaplasmosis could increase substantially. If the Brahman content is reduced, then the risk of both babesiosis and anaplasmosis will be increased.

Tick incursions in the tick-free areas have typically been managed by strict tick control strategies. Tick fever will not occur in the absence of ticks. There have, however, been substantial losses on at least one property associated with tick fever this year in a previously tick-free area. Tick fever vaccination might need to be considered in combination with the tick control strategy.

Vaccination

Should you then vaccinate the whole herd if the decision to vaccinate is made? For all except Brahman herds, the answer is probably “yes”. The *Anaplasma* component of the vaccine is not transmitted by ticks; but we know that the *Babesia bovis* component of the vaccine is potentially transmitted by ticks in some situations, and can become more virulent in the process. This has not caused any concern with use of the vaccine in tick areas where virulent organisms are already present. However, the risk of exposure to larval ticks, which have dropped from naturally infected or vaccinated cattle, could be of concern in areas with new or rapidly expanded tick populations if it was decided to vaccinate only a proportion of the herd.

In any event, whether you have ticks for the first time, the first time in a long time, or have more ticks than usual, be on the lookout for signs of tick fever:

- lethargy
- fever (as the name suggests)
- ‘red water’ (red urine)
- anaemia
- weakness
- jaundice
- some neurological signs.

Get a diagnosis quickly. *Babesia bovis* in particular can cause death in a matter of days after signs are first observed; and the weakness and anaemia associated with anaplasmosis, whilst taking longer to develop, can also result in significant losses.

Further information on tick fever disease, control and vaccination can be found at:

Tick Fever Centre

Biosecurity Queensland
280 Grindle Road, Wacol Qld 4076
Ph 07 3898 9655
Fax 07 3898 9685
Email tfc@deedi.qld.gov.au

DEEDI

Ph 13 25 23
Visit www.biosecurity.qld.gov.au and search for ‘tick fever’

Ticks and tick fever in the Cattle Tick Free/Control Zone

With two good back-to-back seasons leading up to 2011 many beef producers are now facing a serious cattle tick problem. Already this year several outbreaks of ticks have occurred in the Cattle Tick Free/Control Zone. Most cattle in the Cattle Tick Free/Control Zone are susceptible to the disease carried by cattle ticks, known as tick fever.

It has been common practice to vaccinate cattle born and raised in the Free Zone against tick fever before introducing them into the Infected Zone, to prevent losses. However, in the past it has not been standard practice to vaccinate all the herd in the Free Zone, as the infection risk was nil.

The recent tick outbreaks have made the tick fever risk a real possibility and graziers with land located within two properties of any known infestation are urged to consider their options:

- vaccination
- do nothing—take the risk.

Tick fever can be caused by any of these three blood parasites: *Babesia bovis*, *Babesia bigemina*, or *Anaplasma marginale*. In Queensland, *Babesia bovis* is responsible for 80 percent of reported cases. The blood parasites in question are transmitted by *Bophillus microplus* (cattle tick).

Once contracted, tick fever is fatal to about five percent of animals during an outbreak; the remainder are also severely affected. The affected cattle may lose condition, abort, experience decreased milk production or, in the case of bulls, experience a reduced fertility rate due to the fever. Treatment for tick fever is possible but costly. Therefore, prevention is the most cost effective measure.

Beef producers with naive cattle who consider they are at a high risk of tick fever are encouraged to weigh up the costs of a vaccination program against stock and production losses in the event of an outbreak. Cattle ticks are a notifiable disease when they are present in the Cattle Tick Free/Control Zone and must be reported to Biosecurity Queensland on 13 25 23.

Further information can be obtained by contacting Biosecurity Queensland on 13 25 23 and ask to speak to your local biosecurity inspector.

Rachael Palfreyman

Biosecurity Inspector
Biosecurity Queensland, DEEDI, Cloncurry
Ph 07 4742 1311

IX International Rangeland Congress

Rosario, Argentina



The 9th International Rangelands Congress was a big undertaking for the Argentinean Association for Range Management, which was formed in 1999. I had the pleasure of travelling to South America with my wife Leean for five weeks including a pre-congress tour and attending the congress in Rosario, plus some time in Argentina, Peru and Chile before and after the congress.

Pre-congress tours

The South Patagonia pre-congress tour was a dramatic contrast to the rangelands of Australia. This 81M ha region is mostly grasslands and shrublands with smaller areas of wetlands and dense forests. In addition to rangelands, there are dense forests in high rainfall areas. Pastoralism is the most extensive land use.

Pastoralism: The region was settled in 1880s and stocked with sheep across 1200 properties. There are 800 remaining properties with areas ranging from 20 000 ha near the Andes Mountains (600 mm rainfall) to 50,000 ha in the east (150 mm rainfall). The climate is harsh (5–16 °C in summer and -3–4 °C in winter). There is wind-chill from high wind speeds that exceed 20 knots for days on end. Pasture yields with good land condition are 400 kg/ha on the grasslands and up to 2500 kg/ha on the wetlands. Stock numbers peaked at 21M sheep and 0.7M cattle in 1952.

After a long period of overgrazing (1.0 ha/DSE), approximately 10M ha (400 properties) has been abandoned due to desertification. The degradation includes both a loss of desirable perennial grasses and scrub dominance by verbenaceous plants, and watercourse incision which lowers watertables in wetlands resulting in a loss of natural sub-irrigation of pastures. Carrying capacity has been reduced to 10 ha/DSE in some areas. The region now carries 3M sheep and 1.25M cattle.

Foreign ownership is increasing. The foreign owners tend to run guanacos (small domesticated native llama) that produce a 0.75 to 2.0 kg fleece at 12 to 17 microns.

The current extension program to address the challenges faced by wool and sheep meat producers in South Patagonia is similar to extension programs that are conducted in Australia. Their program included: property mapping, land condition assessment, development of grazing management plans, improved sheep husbandry practices, disease control, genetic improvement, better marketing and enterprise diversification, e.g. agro-ecotourism.

We also visited Estancia Potro Aikea, a government research station near the Chilean border that hosts a longterm (12 years) grazing systems trial. The station staff prepared the most appetising parrilla of sides of

lamb for lunch with top-notch Argentinean red wine on what was a cold and windy day (for us Aussies anyway).

Travelling over the grass steppe plateau country is similar in places to driving over the undulating downs country of western Queensland.

Mining: South Patagonia has commercial quantities of coal, gold, oil and gas. Environmental management has been poor until recent years with impacts such as soil erosion, landfills, oil spills, saline waste water, soil compaction, roads and drilling disturbance. Some of this damage was clearly evident from the air when flying. There is now a stronger focus on reclamation activities with site assessment, planned rehabilitation, bio-remediation of oil, revegetation and monitoring, producing effective results.

Timber production: A commercial native forest-based timber industry exists in Tierra del Fuego. We visited a mill that was cutting Antarctic and Lenga beech from a 500 000 ha logging area. Some value adding is occurring locally by producing furniture. The acquisition of some mills by multinational companies is adding more pressure to the industry. The sustainability is questionable due to the short cutting cycle and low growth rates.

Feral animals: Beavers were introduced to Tierra del Fuego from Canada in the 1920s. The beaver populations have exploded and are dramatically altering the ecology of the landscape. There appears to be few, if any, options for management of this problem.

Workshops

The day before the workshops, a group of eight Aussies and Glenn and Bev Shewmaker from the USA did a boat tour of the Parana River at Rosario. There are big islands in the centre of the river that support a beef industry. Cattle owners live in high set homes and use boats as the primary means of transport for people, goods and livestock. The islands flood every year to a depth of one to two metres. This area is in dramatic contrast with the urban area of Rosario which is only two kilometres—but a world—away.

Day 1: Rangeland Management and Restoration Using Ecological Sites: Linking Scientific and Local Knowledge of Ecosystem Dynamics by the US Dept of Agriculture. The highlight was the accessibility of ecological site description reports, soils database (mapping, profile diagrams and vegetation descriptions) on a Google Maps/Google Earth platform at a large scale (i.e.

high level of spatial resolution) for the USA. Have a look at <http://usda-ars.nmsu.edu/esdAccess.html>. Irrespective of land resource assessment method, this is a model that Australia should aspire to for all land uses, including the extensive rangelands.

Day 2: Ecosystem Restoration—Rebuilding Rangelands from Microbes to Landscapes by the US Geological Survey with two case studies:

- *Restoration and sustainable development: examples from Mexico*—there was a great example of a successful bottom-up, longterm approach to land restoration of a severely degraded mixed farming area by a local community, against the odds of an inflexible and out-of-touch bureaucracy.
- *Restoration of Argentina's Rangelands*—demonstrated how a comprehensive program could start to address the challenges of urban drift, overgrazing, low production from livestock, over-harvesting of firewood and adverse mining impacts in the pastoral zone of Patagonia.

A memorable quote came from Dr Luz Bonvissuto when referring to rangelands communities under stress and their need to recognise and take ownership of problems by changing the paradigm, “Not me! – Yes me”, “Not here! – Yes here” and “Not now! – Yes now.”

I also attended *Assessing Rangeland Conditions: What is the Reference and How Is Departure Determined?* by the US Bureau of Land Management. This workshop highlighted the variable level of usage of rangeland assessment data to recommend and make appropriate changes to land management practices. For example, in countries such as South Africa, the demise of rangeland monitoring programs is due to the conversion of pastoral land to cultivation and freehold land to leasehold (communal) land. Google Earth imagery can be used to compare vegetation structure and function through time at regional and global scales—these techniques are worthy of wider use for monitoring range condition over large tracts of land.

The congress

The congress was held in the City of Rosario with the theme *Diverse rangelands for a sustainable society*. It attracted 632 papers, 40 of which were written by Australians, primarily on domestic topics and a few international topics. As with all IRCs there are concurrent sessions. It is not possible to listen to all presented papers.

I was most impressed by the following papers as they documented an outstanding community success story (first paper) or were based on good social or biophysical science (last two papers):

- Layne Coppock (Utah State Uni) *Achieving real development impact among pastoralists: lessons from Ethiopia* (p 679)
- Eric Peterson (Uni of Wyoming) *Developing a*

win-win relationship between producer and land management agency (p 725)

- Rebecca Bartley (CSIRO) *From beef to reef: challenges and triumphs in reducing runoff and sediment at hillslope and watershed scales in Australian rangelands* (p 44)

On reflection after the IRC, there were several ‘hot topics’ that emerged for me, including:

- monitoring rangeland condition and the rate of impact from changed management
- challenges in recovery and production from severely degraded rangelands and the lead taken by women to achieve change (particularly in developing countries)
- woody plants are taking over in the rangelands!!
- managing for production and biodiversity
- diversification of rangelands based enterprises
- managing rangelands under an increasingly variable climate (climate change?)
- indigenous management of rangelands
- land tenure—who owns what
- managing grazing distribution on rangelands

Mid-congress tour

The Beef Production Systems on Rangelands tour travelled across the famous Pampas Region (48M ha of mainly alluvial soils with the 600–1300 mm rainfall) of sub-coastal central Argentina. Traditionally Argentina's prime grazing land, it now also produces vast quantities of grain (soybean, maize, sorghum and wheat) and cotton. This area is rapidly being converted to cropping land (13M ha of soybean in 2003, 18.6M ha in 2011). The expansion of cropping has reduced the cattle herd from 34M head in 1994 to 26M head today. This is still 52% of the national herd. Cattle on the Pampas are British and Euro crosses.

Much of the remaining pastoral land has been over-sown with legumes such as lucerne to improve carrying capacity and individual animal performance.

Government policies on the marketing of agricultural commodities are having a negative impact on primary



producers. For example, there are export levees of 35 percent on soybeans and 15 percent on beef, plus export quotas on beef. In 2006 beef exports were banned for six months in an attempt to reduce the domestic retail price for red meat. This encouraged a rapid expansion of cropping and a reduction in beef production and supply, which increased domestic beef prices!! The increase in grain production has encouraged the expansion of the feedlot industry. In 2011, forty percent of Argentinean beef will be grain finished.

The tour group had the pleasure of visiting the Pampas estancia *La Blanqueada* a 3000 ha property 43 km NE of the township of Venado Tuerto. The property is one of the few in the district that is still run primarily as a beef estancia with 2500 ha of legume-grass pastures and 500 ha of cropping (soybean, corn and wheat). With an annual rainfall of 1000 mm and native *Brachiaria* and *Bothriochloa* pastures over-sown with lucerne plus areas of annual ryegrass and pure lucerne, the property carries 2500 head (1.0 ha/adult equivalent) of red and black angus cattle. Steers are sold at 20 months with a liveweight of 400–450 kg.

The tour group enjoyed a traditional asado (BBQ) lunch with a fine Aberdeen Angus Malbec (red wine) under the shade of a very large Australian river red gum that was planted at the back of the house in 1890. The beef, which was cooked on a parrilla (grilled on an open fire), was superb—as good as any I have eaten in Australia.



Bob Shepherd, FutureBeef Senior Extension Officer, receiving the North Australia Beef Research Council (NABRC) medal for Communications and Extension, 2010.

The rest of the day was spent at the Centro Agrotecnico Regional (Regional Agro-technical Centre) 6 km NE of Venado Tuerto. This is a private agricultural training day-school established in 1968 with 700 students from P to 12 and a 150 ha farm used for cropping, dairying, beef production and food processing.

This mid-congress tour was one of the highlights of the congress for me.

Future International congresses

The 10th International Rangelands Congress will be held in conjunction with the 23rd International Grasslands Congress at New Delhi, India in 2015.

The 22nd International Grasslands Congress will be held in Sydney, Australia in September 2013 with a series of pre- and post-congress specialist meetings and tours held across the country.

Conclusion

Visiting South America and attending the IRC was a real pleasure and a great experience. I can highly recommend the congress for graziers or anyone interested in travel and the rangelands. They provide an opportunity to visit areas that are off the tourist map and meet many people with common interests.

The North Australian Beef Research Committee generously provided me with funding assistance as part of my 2010 Extension and Communication Medal award. Thank you also to the Australian Rangelands Society for generously providing me with a travel grant; it was greatly appreciated.

I also thank my wife LEEAN for travelling with me; I can highly recommend that partners/spouses attend future IRCs.

The above is a reduced version of Bob's report. The full report is available if requested.

Bob Shepherd

Principal Extension Officer

Agri-Science Queensland, DEEDI, Charters Towers

Ph 07 4761 5150



DAVID ANTHONY

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Winter rain not good for grass

Pastures are continuing to deteriorate across the west in the wake of winter rain and cattle producers are urged to act now to prevent rapid weight loss in their stock.

It is important not to wait until there was a visible drop in stock condition.

Recent light rain was not enough for pasture growth, but instead leached nutrients from the grass, and significantly reduced its digestibility, as well as its protein and energy levels.

A reduction in the digestibility means feed intake will also drop dramatically, further contributing to a rapid deterioration in stock condition.

Even before the recent rain there was some fungal damage to grass leaves in the Mitchell Grass Downs country, a clear sign of deteriorating pasture quality, and stock were losing weight.

This weight loss may not have been visually obvious because overall, stock condition was quite good.

Mitchell grass provides the bulk of the feed at this time of year, with stock relying to a lesser extent on herbage for their nutrients.

Where there's buffel grass there may be a response to light rainfall, but even then, the amount of green feed available to stock and how long it will last needs to be considered.

Brittle leaves and feed going black are clear signs that producers need to consider taking immediate action. This could include weaning calves, feeding appropriate supplements, or selling or agisting cattle.

Weaning calves is highly recommended after spoiling rain, to take some pressure off the breeders and help them maintain their weight.

Even if grasses such as Mitchell received the significant amount of winter rain needed for growth, the response will be slow because they grow best in summer.

Even after useful rain, it takes a few weeks for any decent pasture growth and, in the meantime, stock condition will go down.

Producers should not use current stock condition as an assessment tool for making nutritional management decisions.

Diet quality analysis is highly recommended to determine whether urea-based licks will be effective or whether an energy and protein supplement is required.

If pastures are energy-deficient, reducing stock numbers should seriously be considered because it is extremely costly having to begin an energy supplementation program this early in the season.

Désirée Jackson

*Agri-Science Queensland, Longreach
Ph 07 4650 1200*

Post-Yasi: thinking about fire

Five months on, rural landholders in northern Queensland are still feeling the impact of Severe Tropical Cyclone Yasi. Destructive winds and high rainfall from the cyclone have resulted in higher than normal fuel loads from fallen timber and new growth, and few opportunities to clear up debris and establish fire breaks. Yasi's legacy is a potentially serious wildfire season.

A fire plan tailored to landholder aspirations and property conditions will help to reduce the impact of wildfire. To help with this, the Northern Gulf, NQ Dry Tropics and Terrain Natural Resource Management groups, with the assistance of environmental science firm Firescape Science and funding from Caring for Country, have put together a 'show-bag' of fire information resources. These bags are available free of charge to landholders in the cyclone-affected area.

The show-bag brings together practical information from a number of sources and puts it at your finger tips, including a detailed step-by-step guide to compiling a fire plan for your property, guides to estimating fuel load, a list of useful web sites, background material on the role of fire in land management and even an interactive CD for the kids.

Fire information show-bags will be available soon from your local industry extension officer, but if you would like one earlier, please call Firescape Science on 4091 1289.

We would like your feedback and ideas about fire management issues in the area. Let us know through your extension officer or by emailing admin@firescape.com.au.

Firescape Science

Ph 07 4091 1289

Livestock and language

The English language, as eccentric as it is, can be considered one of the most variable and expressive in the world. Many of us don't ever stop to consider the huge variety of expressions and sayings derived from the world around us that have become part of everyday use. Farm animals are no exception—below are just some of the common phrases linked to livestock:

- Black sheep of the family
- Beefing up
- Bull at a gate
- Bull in a china shop
- Bull's eye
- Cash cow
- Cattle class
- Cock and bull story
- Counting sheep
- Gentle as a lamb
- Have a beef with someone
- Have a cow
- Holy cow!
- How now, brown cow?
- Innocent as a newborn lamb
- Kill the fatted calf
- Lamb of God
- Like a lamb to the slaughter
- Mutton dressed as lamb
- One might as well be hanged for a sheep as a lamb
- Sacred cow
- Sacrificial lamb
- Separate the sheep from the goats
- Take the bull by the horns
- Two shakes of a lamb's tail
- Until the cows come home
- Wolf in sheep's clothing

How many others can you think of?

Tonia Grundy

DEEDI Information Officer, Ayr

Ph 0409 034 960

The little fly that could...

Ophiomyia camarae versus *Lantana*

The latest weapon in biological control for lantana is making its presence known in Queensland.

Ophiomyia camarae is non-selective in the form of lantana it invades, unlike some previous biological control agents, aiding to its ability to spread.

O. camarae can travel into large lantana infestations inaccessible by traditional control methods, such as deep gullies and forests.

A native of the Caribbean, Mexico, Central America and Florida, the ideal growing conditions for the fly are towards the eastern coastline. The larva of the small, red-eyed fly does the damage, causing a distinct herringbone pattern of mines radiating from the midrib of the leaf. This triggers the leaves to yellow and defoliate prematurely and so reduce flowering and seeding ability, reduce the spread of the plant and make it easier to control.

The release method has been extremely easy and effective, using either a bag of mined leaves containing pupating flies, hung in the branches of a lantana bush, or adult flies. The adults emerge within a week, mate and lay eggs on the leaves, with the lifecycle completed within 25–36 days.

The fly has been reared at the Tropical Weeds Research Centre in Charters Towers since early 2008. With the assistance of regional councils, landholders and fellow government agencies, over 107 500 *O. camarae* have been released at 83 locations in coastal areas from Cooktown to Gladstone.

Establishment has been seen at over 85% of release sites, with flies being recorded up to 125 km from these original sites. Releases have concluded and monitoring will continue over the next few years.

Keep an eye out for mined leaves as soon you will be seeing them everywhere!

Kelli Pukallus

Biosecurity Queensland, DEEDI, Tropical Weeds Research Centre, Charters Towers

Ph 07 4761 5711



Mined lantana leaves. Inset: Adult *Ophiomyia camarae* (2 mm)

Principles for using vaccines

Primers and boosters

Killed vaccines usually require two initial injections, given at least four weeks apart, to take effect. If the second initial shot is not given, there is every chance that no protection will be provided and the first shot will have been a complete waste. If the second shot is delayed for up to four months after the first, it is likely that a fair percentage of the animals will receive some protection, though not at the same level as would have been achieved by giving the second shot at the recommended time. However, some killed vaccines (for example, two of the available botulism vaccines) have been formulated to enable one shot initially.

Most live vaccines require one initial shot but there are exceptions; for example, the Bovine Ephemeral Fever (BEF) (3-day sickness) vaccine requires the same protocol as for killed vaccines. After the initial shots, annual booster shots are required for most live and killed vaccines to sustain protective immunity.

Vaccinate at the right time

Vaccinate animals before likely exposure to the disease but as close as possible to the likely period of transmission. For example, give Vibrovax to bulls at least 10 weeks before mating and heifers prior to mating. Also give BEF vaccine to at-risk cattle prior to the wet season.

It is difficult to vaccinate calves, but they do require protection. They can get this from antibodies in the colostrum immediately after birth. Maximise the levels of antibodies in the colostrum by giving breeders their annual vaccinations prior to calving. Diseases like pestivirus can spread during mating and vaccination before calving is strongly recommended in herds where this disease is a problem.

Avoid vaccinating wet cattle. The chance of infection at the injection site is much greater in wet cattle.

Plan for giving multiple vaccines

Some vaccines can interfere with the development of immunity from other vaccines if they are given at the same time. For example, avoid giving tick fever (blood) at the same time as any initial (priming) injections; it can be given at the same time as boosters.

Vaccines based on gram negative bacteria (this includes most of the bacterial vaccines) can cause toxicity problems (endotoxins) in some cattle if multiple vaccines are given. Avoid giving more than two bacterial vaccines at the same time.

Live and killed vaccines

Killed vaccines are a mix of the dead bug (minced up) and compounds called adjuvants which stimulate the development of immunity.

Water-soluble adjuvants are preferred, but sometimes oily adjuvants are used to get enough stimulation; examples of these are SingVac and Vibrovax. This extra stimulation can cause prolonged site reactions if the injections are not given properly. Live vaccines have altered organisms to cause immunity but not disease. They do not generally have adjuvants.

Hit the right spot, gently

Even when given properly, all vaccines cause significant reactions and pain for up to a week, to the point of lameness in some animals. A swelling will be seen on most animals at the injection site in the days after injection.

Most vaccines for cattle should be given under the skin, especially oil-based vaccines. If the vaccine is injected into muscle severe reactions can occur. The preferred site is above the backbone in the neck area forward of the hump. Injecting into this site will minimise the potential for carcase damage.

The needle should be sharp and clean and should be inserted as gently as possible. The best needles are capped but are only available in 3/4 inch (Monoject 16G); 1/2 inch needles would be ideal if they were available.

The anal fold is an UNACCEPTABLE site for vaccination; there are too many nerves, blood vessels, and opportunities for infection, and this site is adjacent to several valuable meat cuts.

Avoid injecting more than one vaccine into the same site. Before starting to vaccinate a group of cattle, determine where each vaccine will be injected, for example either side, forward or back of neck area.

Handle vaccines for effectiveness and safety

Vaccines should be treated a bit like milk. Vaccines exposed to freezing, heat or light can break down and become ineffective. The sterile packaging means vaccines can have a much longer shelf life than milk, but they must be kept refrigerated. Refrigeration needs to be maintained crush-side during vaccination.

Once a pack is open, its sterility is lost. Opened vaccines that are kept chilled and clean can still be used within a week. Use clean gear. Re-usable guns should be disassembled, cleaned, sterilised and reassembled between each use. Disposable guns should be replaced after use.

Don't miss the animal and get yourself. A 16 gauge needle hurts. If you inject yourself with vaccine it can cause nasty prolonged reactions. It is VERY important to ensure you do not accidentally vaccinate a person with an oil-based vaccine as this can cause very serious reactions requiring surgical excision and causing significant permanent damage.

Geoff Fordyce

DEEDI, Charters Towers

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Lessons from the 1974–1978 beef crisis

The beef marketing slump of 1974–1978 was triggered by an oil supply and price crisis that saw Japan suspend purchases of imported beef at a time when Australian cattle numbers were at an all time high. At the time the US was our biggest export market, not Japan. But the closure of one market brought the whole industry down. Many graziers had shifted from sheep to cattle in response to the ‘wool crisis’ that had begun in the late 1960s and were still carrying the debts from the changeover.

The collapse came when seasonal conditions were good, allowing producers to hold cattle back from the market, and the recovery came during a drought, when some had taken their losses and others had by then severely degraded their country.

These are some of the lessons from those days:

- The market fell faster and further than anyone thought possible.
- It stayed down for longer than anyone expected—at first producers hoped it would turn in a matter of weeks, and then months, but in the end it took four and a half years.
- When the recovery came, the rise was faster than anyone expected.
- While all prices fell, the fattening margin was preserved, allowing some to remain profitable.
- Store producers were hardest hit. The nearly-lost art of spaying was rediscovered, allowing store producers to fatten and sell some cows while allowing steers to grow on.
- Many producers were paralysed by the thought that they had paid so much more for steers than they were now worth, so they kept hanging on to them. The smart psychology was to accept the loss and focus on the margin between sale prices and replacement costs.
- Many producers hung on to cattle waiting for the recovery. For some this worked but, for those who hung on to too many, the result was still a forced sale into a still depressed market.
- In many areas 1974–1978 represented an episode of massive land degradation from gross overstocking as cattle were held back from the market.
- Land prices took a big hit. Mulga country could be bought for \$1.20/ha, and some Gulf properties were advertised with stock for \$40/head.
- Cattle husbandry and mustering were, in many instances, abandoned leading to large numbers of cattle being rediscovered in 1978. This was a bonus to property purchasers at this time, which also coincided with the introduction of helicopter

mustering. Many properties bought at this time were paid for out of the windfall mustering result. The end of the slump was a time of opportunity for the bold.

Here are some thoughts for next time:

- Don’t hold your breath waiting for the recovery.
- Restructure to produce a fat turnoff. This will mean doing the sums on age of turnoff, and it may mean getting a tie up with some fattening country.
- Use good country for fattening rather than waste it on breeders.
- Restructure the herd rather than hoard it—by all means hang on to steers while they grow into some value, but get rid of fat cows while doing it.
- Don’t get hung up on what they still owe you—get on with the trading and take the win on the cheap replacements.
- Confine the cost cutting to the overheads but try to maintain husbandry standards.
- Be ready for the bargains when things start to come good again.

Bill Holmes

*Principal Agricultural Economist (Retired)
DEEDI, Townsville*



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Age of male turnoff —a critical issue for profitability in northern Australia

Northern Australian cattle breeders sell male progeny into a variety of markets at ages ranging from several months to as much as four and a half years.

The most profitable turnoff age is not the same for everybody, since it depends on breeder productivity, steer performance, price relativities and available markets.

Modelling exercises using Breedcow and Dynama software over a 25 year period to 2011 have consistently pointed to 'older' turnoff being more profitable, where 'older' can be defined as anything other than weaners.

For NT and far northern WA, with no reasonable access to meatworks, the upper limit to 'older' has been defined by live export specifications. Most recently this has been 350 kg LW to Indonesia (pre-ban), although at times heavier cattle have found markets in Indonesia and Egypt.

In north Queensland, 300 kg dressed weight has been a reference point for bullock producers. This weight has been achieved by turnoff at two and a half (exceptionally), three and a half or four and a half years.

Examples

The following data comes from a large modelling exercise under the auspices of the Beef CRC, and assisted by beef extension officers from Queensland, NT and WA. For this illustration, the data is split into that part of the profit (gross margin) generated by the breeders, and the part generated by growing out the steers. Growout was to ages ranging from a year and a half (live export) to four and a half years.

Weaner steers were 'sold' from the breeding enterprise at market value to the steer enterprise at ages of five to nine months. Prices were estimated in April and May

2011, prior to the live export ban. This data aims to represent the whole herd in the defined area.

Note that although the steer GM is the profit centre of the herd, the steers comprise the smallest part of the herd. The most profitable part of the steer enterprise, measured as GM/AE, is the first year after weaning, assisted by the lower AE ratings (weaners eat less than adults).

Results from NT and WA indicate the highest GM/AE coming from steers, with the smallest proportion of the herd comprising steers, because turnoff is predominantly at a year and a half. The percentage of total GM from the steer part of the herd indicates the disproportionate contribution of the steers.

Herd structure and age of turnoff

The following numbers are from one of the more productive north Queensland regions modelled for the Beef CRC. They illustrate, for a herd held at 5000 adult equivalents (AE), the relationship between age of turnoff, breeder numbers, GM/AE and total herd capital.

	Wnr	18 m	30 m	42 m
Adult equivalents	5000	5000	5000	5000
Breeders mated	3343	3009	2547	2131
Calves weaned	2293	2063	1747	1461
GM/AE	\$172.60	\$209.44	\$216.28	\$192.70
Herd capital	\$2.85M	\$2.92M	\$3.03M	\$3.17M

Principles

Optimum age of male turnoff is driven by the relative profitability of breeders and steers, which is a function of breeder productivity, steer performance and the relative prices of weaners and older steers.

The age of turnoff decision can be conceptualised as a series of decisions, the first of which is whether to sell the steers as weaners or to carry them another year. If the answer is to carry them to 18 months, the next question is whether to go on to 30 months, and so on.

	Herd GM/AE	Breeder GM/AE	Steer GM/AE	Total AE%	Breeder AE%	Steer AE%	%GM steers
Queensland	\$186.40	\$159.15	\$264.68	100%	74%	26%	37%
Northern Territory	\$109.60	\$82.07	\$349.17	100%	90%	10%	33%
WA nth of 26° Lat	\$102.94	\$68.57	\$314.70	100%	86%	14%	43%
Overall	\$172.64	\$142.81	\$270.81	100%	77%	23%	37%

GM = Gross Margin; AE = Adult Equivalent

For complete data see Representative Herd Templates for Northern Australia at www.dpi.qld.gov.au/16_6886.htm

The files themselves can be viewed using components of Breedcow and Dynama software (same site) or the text and Excel summary documents can be viewed after downloading the whole content.

We assume that total stocking pressure is the same, with breeder numbers reduced to accommodate older male turnoff.

If growing a weaner steer out to 18 months earns \$349/AE, as for the NT example, while the breeders are making only \$82/AE, then clearly age of male turnoff should be at least 18 months. Ten percent of \$349 plus ninety percent of \$82 (= \$109) is a lot better than one hundred percent of \$82.

The next question is whether it would be worth taking the steers on another year to 30 months. The comparison then will not be with just the breeder GM but with the overall GM up to that point, namely \$82/AE. If the extra year can make more than \$82/AE it will drag the average up, and if it makes less it will drag it down.

If we ask this question in the NT, older turnoff will involve sending the heavier steer a long way to market and getting a lower price per kg, so the answer could favour retaining the 18 month turnoff. If the live export ban destroys the market or does lasting damage to the 18 month price, the older turnoff may gain some traction. The answer as always will be in the sums.

If we asked the same question in Queensland, with better access to markets for heavier cattle, we are likely to conclude that 30 month turnoff is clearly preferable, and perhaps another year after that as well, although

each increase in turnoff age will be less profitable than the one before.

Producers questioning the age at which they currently turn off steers can run whole herd comparisons using Bcowplus software (part of Breedcow and Dynama), or they can compare their existing overall GM/AE (Bcowplus) with GM estimates for another year of steers (Bullocks program).

Other issues

To a small degree, most profitable male turnoff age is influenced by female productivity, since it is the tension between breeder profit and steer profit that drives age of turnoff. For the less productive areas of northern Australia, the degree of improvement possible in breeder productivity may move optimum steer turnoff age back a year. Improved breeder productivity is profitable in its own right, and has the dual payoff of better profit from the breeders themselves and an increased proportion of steers in the herd at the same turnoff age (hence more of the higher GM/AE).

A herd of cattle represents a significant investment in livestock capital. More importantly, this capital differs for herds of the same size (total AE) depending on age of male turnoff. Herds turning off older steers tie up more capital than herds turning off weaners. The incremental approach to determining best age of turnoff thus has a capital dimension to it as well.

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Shifting the age of turnoff up a year may increase the gross margin, but it also increases the investment in the herd. The extra gross margin must be sufficient to justify the extra capital. This can be ensured by including interest on livestock capital in the gross margin calculation.

These shifts in herd capital can perhaps best be illustrated by what happens when age of turnoff is increased. Assuming the change is implemented in one year, the male turnoff is held back for that year, and room is made for the extras by selling more cows. The cows are worth less than the unsold steers, so the herd increases its value while income goes short. Similarly, if age of turnoff is reduced, by selling two drops of steers in the one year and holding back some cows, there is a flush of cash as herd capital is liquidated, though this is usually mistaken for income.

When producers know that older turnoff will be more profitable, but cannot endure the income sacrifice (capital accumulation) required to get there, they can be said to be caught in 'the store trap'. This may explain the attraction of seemingly illogical sales of younger cattle, even weaners. This situation can arise during the recovery period from crises, or in the establishment phase of a business.

Separate fattening country

Selling older steers is almost always preferable to selling weaners for the integrated breeding and growing property, but this may change if a separate fattening property enters the picture.

When a breeding property is combined with a fattening property, the problem becomes one of maximising profit on both properties, or at least on the combination.

The two-property situation can be analysed by an assessment of each property using Bcowplus and Bullocks programs. The process is:

- Find the most profitable turnoff age for the breeding property, ignoring for the moment the existence of the fattening property.
- Run the 'tools breakeven' function in Bcowplus. This calculates the price that would need to be received for each possible age of turnoff to equal the gross margin after interest indicated for the current turnoff age. If these prices are used to 'sell' stores to the fattening block, profit on the breeding place will be the same regardless of turnoff age.
- Using Bullocks program, assess 'purchase' of stores for the fattening block from the breeding property using the breakevens as the purchase prices. Also check the profitability of some outside purchases. Select the most profitable purchase option, or a combination of options.
- Adjust breeder numbers to accommodate the selected transfer age.

The two-property situations looked at so far indicate a strong preference for transferring steers to the fattening block as young as possible, though this will be influenced by the relative sizes of the properties.

Industry perspective

The integrated breeding and fattening operation mirrors the situation of the industry as a whole, suggesting that overall productivity would be greater if steers were transferred to fattening country as weaners.

Cattle breeders however will not sell weaners if this is their least profitable turnoff age. The exceptions are those caught in 'the store trap', or perhaps those who are simply unaware of the profit opportunity of keeping their steers longer. One reason that weaner turnoff is unprofitable is that weaner prices are below their opportunity value to the people who breed them. This situation might change if there was a more widespread recognition of the folly of selling steers too young.

Extension activity directed at improving age of turnoff decisions, by shifting the relative price of weaner steers, might help guide industry towards a more profitable aggregate breeding and fattening position.

Conclusion

Getting age of male turnoff right is something we can do without driving the country any harder, and without changing the underlying parameters of the herd.

What it will require, if getting it right means selling older steers, is some additional herd capital. This should be viewed in the same light as expenditure on more tangible assets—as an investment whose function is to improve profitability.

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Both available as DEEDI web downloads from: www.dpi.qld.gov.au/16_6886.htm

W.E. (Bill) Holmes
Principal Agricultural Economist (Retired)
DEEDI, Townsville

Leading this report is the critical situation with our live exports to Indonesia after the Four Corners TV program several weeks ago. Everyone, including cattlemen, was appalled at the scenes shown on the program. The Federal Government's knee jerk reaction and the imposition of a complete ban for six months on live exports to Indonesia was no surprise. In any crisis a cool head is needed and our Government leaders needed to go to Indonesia first and discuss the issues of public concern in Australia and maybe develop a way forward.

As it stands now our Government could agree to allow the trade to resume under certain conditions but the critical point here is: will the Indonesian Government issue import permits or have they moved on to other arrangements? If there is a shortage of beef or if our cattle are cheaper than other options we may have a chance of getting straight back into the market quickly, but otherwise it could be a hard road ahead.

The ban has tipped cattle marketing and movements upside down across northern Australia. With boats organised, thousands of cattle in yards at ports across northern Australia and in nearby holding yards and clients in Indonesia left short of cattle, it's a big blow to all concerned in the live export supply chain.

There is no doubt questions need to be asked about why we are in this situation, but in the immediate future our industry leaders need to move forward and quickly resolve the issues, and try to turn this around to get the live export trade back on track. The situation has many northern producers under financial and emotional strain.

Beef producers across northern Australia are particularly vulnerable to this shut down as the live export trade is their most profitable option. Also, their cattle marketing is concentrated to the dry season and often by November–December the breaking wet season limits road access to most properties, so a six-month ban is basically a ban until after the wet next year.

Our total cattle live exports fell 8% in 2010 to 873 573 head, worth \$679 million. Indonesia took 520 000 head and Middle East destinations took 226 000 head.

The fat cattle market situation across north Queensland is familiar for this time of the year with heavy bookings and falling rates at all meatworks, with the abundant supply of fat cattle being marketed before pasture conditions decline too much. In addition we have very flat trading conditions with both Japan and USA, with ordinary demand for our beef, and our high dollar not doing us any favours, resulting in our domestic wholesale market awash with beef. Our exports to the USA for the first five months of 2011 are back 22% on the previous year's sales.

Despite frequent articles in the press and on TV giving a positive outlook for agricultural commodity markets,

the underlying economic situation across the globe is not a rosy picture. Europe, where Greece and other EU countries are in severe financial stress, the USA economic forecast is ordinary with their huge debt and the Japanese are struggling to re-build after earthquakes and nuclear power plant problems.

Some interesting news from the Australian domestic market performance is that our independent butchers are making ground on the major supermarkets. Rolling 3-monthly sales figures show the independent butchers holding 29.4% of retail sales, which is up slightly, with Woolworths back to 27.5% share and Coles down slightly to 20.8% of total sales. These figures are surprising as we had a fierce promotion and marketing campaigns, first from Coles just before xmas with their HGP-free beef and then heavy discounting from Woolworths, to attract consumers. The butchers name customer service, maintaining top quality product plus product variety and value-added or ready-to-cook meals as their main advantages. Fresh meat consumption for 2010 in Australia is led by beef on 39%, followed by chicken 29%, lamb 17% and pork 12%.

The report states that the average retail price for beef over the last three months was \$15.35/kg, which is nearly 5% less than last year's figure.

Readers of this column would remember previous beef supply chain costs mentioned and a \$3/kg carcass price to producers equates to approx \$11–12 cost at the butcher's counter (carcass shrinkage, bone-out yield, labour, boning costs, packaging, transport and preparation for sale), leaving a \$3–4/kg margin, at best, for the retail sector.

At a recent butcher's conference in southern Queensland they all reported that customers have been asking a lot of questions over the counter about how the beef they were purchasing was raised and slaughtered. So, the Four Corners program has pricked our domestic consumer as well and we need to be on the front foot with welfare concerns at home too.

Some interesting news from Teys is the start of processing of certified-organic beef at their Biloela works. Product will be aimed at both domestic and export markets.

The Australian feedlot sector is doing it tough with high feeder cattle prices and a flat market in Japan causing plenty of hip pocket pain. Despite the poor margins, cattle on feed for the March quarter were up 10% to 779 000 head. Total grain-fed beef exports for the first quarter of 2011 back to 50 777 tonnes. There has been a lot of talk of improving market demand from the EU for grain-fed beef and JBS Australia is rolling out several new brand names specifically for the EU grain-fed market.

The rural press has given us some details on our new

MLA chief, Scott Hansen, who took over the reins in early July. Scott has been our man in the USA for the last couple of years and is talking up our market prospects for grass-fed product into the US. It's a product they can't produce over much of their country because of the harsh winters, and Australia's MSA graded grass-fed product has significant potential into North America.

Estimated cattle numbers in Australia ending June 2010, 26.55M head with drought across eastern Australia impacting on numbers.

USA

Negotiations are still on-going with Korea for ratification of a free-trade agreement between the two countries. USA total beef exports are rapidly growing with the January–April 2011 sales totalling 389 000 tonnes. The USDA is predicting 2011 beef exports to exceed one million tonnes. Beef into Japan still has to be under 20 months of age and for Korea the age limit is 30 months. With the value of the US dollar at present they are making serious inroads into the Japanese and Korean beef markets.

Total US beef production for 2011 is expected to reach about 11.8M tonnes, slightly back on 2010 figures. Pork production for 2011 is approximately 10M tonnes and chicken 19M tonnes.

The US cow herd is expected to continue to decline due to rising costs and low profitability.

South America

Russia is Brazil's single main export market but sales over the last few months have dropped below previous year's figures and more product has found its way to the Middle East. Average export prices for Brazilian beef have been quite high at US\$5226/tonne. Total volumes shipped so far this fiscal year are back as well at 793 889 tonnes, which is 8% lower than the previous year.

The 2010 cattle slaughter of 29.3M head produced 6.97M tonnes of beef.

Brazil continues to develop its live export industry with 103 000 head exported in the first three months of this year. Their main market is next door in Venezuela but live cattle are also being shipped regularly to the Middle East. Brazil, with 187M head, has the second largest cattle herd in the world, behind India with 303M cattle, 40% of which are buffalo.

The Argentinean beef industry is going through a herd re-building phase that has reduced turnoff sales numbers and forced prices up to AUD2.90/kg live for young cattle, and AUD2.10/kg live for slaughter stock. There has been a 15-year low in the annual calf drop as industry problems since 2005 have seen the loss of many producers and a herd reduction of 10M head.

Korea

The Korean market for our beef has been steady, considering the high value of our dollar and the competitive value of the US dollar. Since the start of 2011 Korea has imported 22% more beef than the previous year, which is a good sign for their economy. Beef consumption is up to 9.3 kg/head/year, which is a 27% rise on the previous year's figures. The imported beef market share at present is Australia 51% , USA 35% , New Zealand 12% and Mexico 2%.

China

Industry analysts are predicting a decrease in Chinese beef production in 2011, down to 5.45M tonnes. Despite high beef prices domestic cattle supply continues to slide due to low profitability compared to pork and chicken production. Australia does live export, mainly of dairy cows, to China.

Bernie English

DEEDI, Kairi Research Station

Ph 07 4091 9440

Greg Brown

Meadowbank Station

Reef safe grazing project

The Far North FutureBeef Team has recently become involved with the ReefFocus Extension project in the Herbert and Johnstone River catchments. This project includes all industries in these catchments (grazing, dairy, cane, banana, forestry and mixed cropping enterprises) with the aim of boosting productivity and profitability, while improving water quality in reef catchments.

Our team will work with beef producers via on-property work, group workshops, industry groups, small field trials and internet technology, with a focus on grazing land management, herd management, improved pastures in the Johnstone catchment, fertiliser application and management of frontages. This project will also include a water sampling project in the Herbert catchment, where producers will collect water samples from various points along the Herbert River to understand fluctuating water quality in this catchment.

As many producers are aware, Environmental Risk Management Plans (ERMPs) have been introduced into the neighbouring Burdekin catchment. We see this project as a way for industry to be proactive in relation to land management and maintaining water quality in a reef catchment.

As a part of the project, a Breeder Management Forum was held at Gunnawarra Station on Tuesday 12 July. The focus of the day was managing the breeding program,

improving herd productivity and balancing these with grazing land management to ensure adequate break-of-season groundcover and minimal sediment run-off into rivers and creeks.

If you live in the Upper Johnstone or Upper Herbert catchments and would like to be involved in the project or wish to discuss any beef production issues please contact us.

Kiri Broad

Far North FutureBeef Team

Ph 0428 102 841

2011—A good season but plenty of challenges ahead

What an eventful, and in many ways, a very stressful year! On a positive note an early season break was delivered with handy rain in October 2010 and great follow-on through until April. Cyclone Yasi knocked the stuffing out of people, fences, sheds and roads with the mustering–weaning round two months behind. June delivered another blow with the live export ban and even with the recent lifting of the ban it will take a long while for trade to recover. Through our on-property SavannaPlan work this year the following marketing and management issues are common across many family beef businesses.

Markets

This is not the first time the live export market has been on shaky ground over the years and it's important to be flexible with your marketing options. Do you need to sell more cull cows to pay the bills this year? The old rule is 'breeder for the country and bull for the market'. Is your breed mix suitable for the tableland, coastal or southern markets? Many properties are having two bob each way and trying a few softer bulls to spread their marketing risk. Auction Plus is also a handy way to present sale cattle and tap into a wider market.

Breeder management

With our savage northern climate it is very common for a breeder to wean a calf every two years. It is encouraging to see so many producers across the Gulf trying to improve breeder performance and branding rates. Some producers are using controlled mating to reduce out-of-season calves, weaner feeding costs and weaner deaths. But in some cases the branding rates have taken a real hit. There is plenty you can do to improve breeder fertility before launching into a 3–4 month controlled mating program. Firstly, the more successful producers have their stocking rates spot on to ensure there is always plenty of feed in front of the cattle and also have an annual wet season spelling

system in place. Many start with preg testing dry cows first round to pull out empties, separate late calvers and save on feeding costs. It is also more common to see bulls taken out second round to help tighten calving windows. A big constraint on many properties is a lack of paddocks to separate different breeder groups or heifers and with the cost of fencing and waters this is not an easy problem to overcome.

Next year

With the first weaning round completed very late on most places, there will be a flush of calves in April next year. How are you planning to deal with those weaners next dry season? Have you got enough weaner paddocks and will weaner paddocks get a spell this coming wet season? Are you set up to feed those weaners? Can you afford to feed those weaners? The SOI is also rapidly falling and if you were a betting man or woman (and in the cattle game you all are) you would be a little nervous about the chances of a below average season this coming wet. Keep an eye on the SOI trend and seasonal forecasting over the next few months.

Dry season licks

With the exception of paddocks with some stylo pastures, most properties are moving into dry season feeding programs. This is a significant cost for most properties at around \$25–30/head. As mentioned previously many producers are separating calving groups and targeting dry season feeding to those cattle most in need, such as late calvers, heifers and late weaners. Dung testing at around \$50/sample can give you a good idea of feed quality and help you time urea feeding. Call the Beef Team if you want to get some samples away.

Big response to spelling

Those producers with an annual wet season spelling system in place have reported how well pastures (particularly the 3P grasses) have responded to the great wet season this year. Wet season spelling research also shows a big improvement in pasture condition in above average and extended wet seasons and less response in below average years. Only if you have some country spelled each year can you capitalise on the good years. Once again a lack of paddock infrastructure makes it difficult to implement annual spelling. Electric fencing is being used quite successfully on some properties. Electric fencing costs are around \$1000/km (materials and labour) compared to traditional fencing at \$5000/km, but it is critical to keep fencelines clear. With northern beef producers spending more than they earned over six of the last seven years, every cost saving is critical.

Joe Rolfe

Far North FutureBeef Team

Ph 0427 378412

State of the environment monitoring

Northern Gulf RMG and the DEEDI FutureBeef team are working together to develop State of the Region Monitoring. State of the Region Monitoring is recording information about the health of the landscape across the whole Northern Gulf region.

This involves recording landtype, tree thickening, different pasture and weed species, pasture yield, soil surface condition and groundcover.

We will have 260 sites across the Northern Gulf region. Half of these were established in 2003–2004 and will be revisited; 100 new sites will be put in this year. We aim to cover a wide variety of landtypes across the whole region.

This information is then collated to give us a picture of the land condition in different parts of the region. This will give us an indication of where we need to focus our activities (e.g. funding for erosion, weed and pest control, fire management, grazing management etc).

It will enable us to:

- report on the health of, and any change in, land condition
- make recommendations for longterm catchment management and land use planning decisions
- improve the cost-effectiveness of public and private investments in environmental management and repair.

NGRMG will hold all the data collected. Individual site data will not be released to anyone. Region-wide maps may be published which may be available for the general community but it will not be at the property scale.

The State of the Region Monitoring will make it easier for Northern Gulf and the FutureBeef Team to identify where their programs are getting results and where they need to do more work. It is also a great tool for applying for funding.

For more information contact

Erica Blumson
Grazing Lands Officer/
Regional Landcare Facilitator
Northern Gulf Resource
Management Group,
Croydon
Ph 0488 499 266

What's new in Landcare?

Landcare is made up of local people volunteering to do practical things to restore and repair their landscapes. In the 1990s the Australian Government declared the Decade of Landcare, this legacy continues today with more than 4000 landcare groups across Australia (Landcare Australia). The landcare website www.landcareonline.com.au offers information on where landcare groups and regional landcare facilitators are located, events, links to funding, support and tools for landcare groups and a junior landcare section.

The advantages of having a local landcare group include opportunities to share information, work towards common goals and an opportunity to meet with neighbours and others in your catchment. Establishing and maintaining a group requires a number of committed individuals. Landcareonline has a *Landcare Group Starter Package* that outlines what is involved in starting a group including determining a need for a landcare group in your area, forming partnerships, having an initial meeting to gauge interest, setting up the group and formal requirements for setting up a committee, bank accounts etc to registering your group online.

Regional landcare facilitators work with community-driven landcare and producer groups towards sustainable land management. Regional landcare facilitators can assist groups to apply for funding, help to organise field days and provide information on natural resource management.

Erica Blumson

Grazing Lands Officer/Regional Landcare Facilitator
Northern Gulf Resource Management Group
Croydon
Ph 0488 499 266

Grazing forums in the Gulf

Northern Gulf Resource Management has been busy preparing Grazing Forums for producers in the Gulf region. The first forum was held in mid-June and included presentations on *Resilient Beef Businesses*, *One-Off Environmental Recovery Grants* and monitoring and biodiversity updates.

Highlights of the day included Mike Digby, regional mapping services coordinator from Northern Gulf Resource Management Group (NGRMG), presenting information on *Developments in Mapping Technology*, *Property Infrastructure*, *Flood Inundation Mapping and Elevation Models* and *Drought and Flood Risk Models*.

Another highlight was inventor Ian Bell discussing his

Around the NORTHERN GULF

Inventor, Ian Bell, talking about collapsible, flood proof, fencing at a Grazing Forum in Croydon



collapsible flood-proof fence. Ian has made the design publically available, for the first time, to graziers in the region.

The last Grazing Forum was a 1½ day event at Cobbold Gorge, south west of Georgetown on the

25–26 July. The Cobbold Gorge Grazing Forum had a huge program with speakers on everything from vegetation management regulations, nutrition and herd productivity, pastures from space, to fire management and perpetual lease upgrades. Speakers came from across the state to share information and to take back ideas from the grazing community. On the Monday afternoon there was a Northern Gulf and The Grazing Industry Open Forum—an opportunity to share ideas for future direction.

For further information on the grazing forums contact:

Erica Blumson

*Grazing Lands Officer / Regional Landcare Facilitator
Northern Gulf Resource Management Group, Croydon
Ph 0488 499 266*

Bulldust Expo

Barra, Beef and

Where the outback meets the sea, Karumba will be the centre stage of the inaugural Barra, Beef and Bulldust Expo held 4-6 November 2011.

Starring Troy Cassar-Daley, Mary G, David Hudson and Shane Howard, this is one event not to be missed. Locals and visitors will experience the best of the Gulf region with a bull ride, tours, forums, expo stalls, art, beef'n'barra cook-offs and more.

A free Primary Producers' Seminar will be held Friday 4 November at the Karumba Civic Centre. Topics covered include the live export industry, Delbessy Agreement and increasing stock fertility rates.

The expo and aligning activities will promote sustainability of the Gulf region's community, environment, culture and economy by showcasing projects, services, tourism, partnerships and businesses. Addressing the needs of remote communities will be of particular focus, by attracting businesses and service providers who are not readily accessible to the region.

The Expo will be hosted by the Northern Gulf Resource Management Group in partnership with local community members and other key stakeholders across the entire Gulf region.

The event is envisaged to be a catalyst for building partnerships and networks; extend the business and tourist season in the region; raise the profile of all sponsors, stallholders and activity hosts; generate opportunities for increased investment and business collaboration; and increase the sustainability of land management practices across the region.

Tours and attractions will be promoted along the Savannah Way and Overlanders Way on-route

to Karumba. The main Expo day will be held on Saturday 5 November at the Karumba Recreation Grounds. Stallholder registrations close 3 October. Calls for sponsors are still open. For catering purposes, book your place for the Primary Producers Seminar online.

Get in quick to buy your tickets to see Troy Cassar-Daley and others perform live.

Book your beds early as accommodation is limited.

For full event information and ticket sales visit www.barrabeefandbulldust.com.au or phone 07 4062 1330.



Bull selection tips

The season for buying new bulls and making home-bred bull selections is drawing close. How far into the future does the bull you start using today, directly influence your herd?

A good sound bull may be in the herd for four years. His daughters could be in the herd for 12 years. Therefore, a bull's genetics may directly influence your herd for up to 16 years.

Bulls have the following genetic influences on their progeny:

- when they reach puberty
- how long it takes a female to re-breed after calving
- growth rate
- carcass traits
- temperament.

All these traits are measureable, predictable, heritable and economically important to beef businesses. But how can these traits be addressed for your herd?

Bull Breeding Soundness Evaluation (BBSE)

Fertile bulls are a 'must have' to increase your herd's profitability.

The BBSE was developed by veterinarians to standardise bull fertility testing and to provide a consistent descriptor of bull fertility.

The components are:

- scrotal circumference (cm) and tone
- physical examination for faults in the head, legs, joints, sheath and penis
- semen analysis for motility
- morphology (or structure of the individual sperm cells)
- mating behavior and ability.

The BBSE is not a genetic evaluation of reproductive traits, but an indication of the bull's present reproductive function.

Breeding objectives

We recommend setting breeding objectives for your herd. Objectively link the current herd performance for a range of economically important traits to where you would like the herd to be. For example, you may come up with objectives such as:

- increase calving percentage by 5%
- reduce age at puberty and get heifers in calf earlier in their first season
- increase weaner weight
- reduce age at heavier weights
- Increase inter-muscular fat percentage.

The follow-up that is needed is to identify the measureable traits in bulls that will meet these objectives.

Using Breedplan EBVs for economic traits

Fertility

- Scrotal Size EBVs—above average EBVs will lead to earlier puberty in daughters. Use in conjunction with minimum actual scrotal size.
- Days to Calving—where available, because not all breeds have them. Below average EBVs lead to quicker re-breed times after calving.

Growth

Better genetic growth will contribute to:

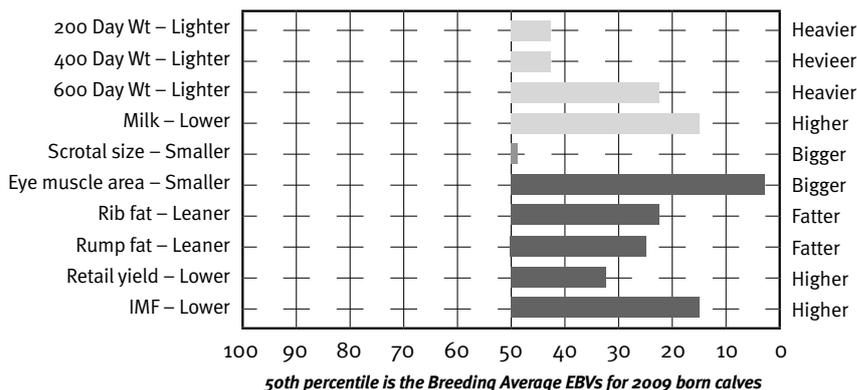
- higher mating weights in heifers.
- heavier turnoff cattle at younger ages.

Carcass

The carcass traits of eye muscle area, rib and rump fat and inter-muscular fat can all be improved (or decreased), depending on the objectives, by using the carcass trait EBVs.

Breed average

Always check for the breed average for each trait and see where your purchase prospect sits relative to the average.



*Example
Droughtmaster
Bull EBVs—2011
Droughtmaster
Group BREEDPLAN*

Balance in selection

We recommend using balanced selection across the traits for fertility, growth and carcass.

Further detail on bull selection and genetic traits is in Northern Muster, Issue 25, August 2010.

Alan Laing

Senior Extension Officer (Beef), Ayr

Ph 07 4720 5115

Phosphorus favourite updated

Northern cattle producers will soon have the latest phosphorus research results at their fingertips thanks to the revision of an old favourite text.

Phosphorus Nutrition: of beef cattle in northern Australia was first published in 1994 in response to a call for a one-stop book on the issue of phosphorus deficiency in northern pastures, and producers can expect a raft of new, practical information in the updated book.

The revised edition will not only include the latest Australian research results, but a comprehensive literature review of phosphorus research from around the world. There are more accurate recommendations of animal phosphorus requirements and details on using simple diet quality sampling techniques to determine when cattle are likely to respond to a phosphorus supplement.

Wet and dry season supplement strategies for livestock have been updated and there is new information on the primary sources of phosphorus available. An important finding is that some Mitchell grass areas, once thought to contain adequate phosphorus levels, have now been found to be phosphorus-deficient. This has significant implications for cattle performance on these pastures.

All the information is aimed at assisting northern producers to make better-informed phosphorus management decisions. This includes decisions about when to feed, and what licks to provide to produce the biggest response in the animal.

Phosphorus is a key driver of performance in cattle in northern Australia and studies have shown the benefits of phosphorus supplementation.

Phosphorus is the second most abundant mineral in the animal's body and it's needed so cattle can utilise all of the protein and energy in their diet. This is particularly important during the wet season when protein and energy levels are at their peak. There is widespread deficiency of phosphorus in northern Australian pastures so phosphorus supplementation should be an integral part of management.

Incorporated into the book are producer case studies from several locations across the north, clearly demonstrating the benefits of phosphorus supplementation. Benefits include increased profitability and productivity of livestock, as well as reduced mortality.

The project is funded by Meat and livestock Australia (MLA) and led by the Queensland Department of Employment, Economic Development and Innovation (DEEDI).

Agricultural staff from Queensland, Northern Territory and Western Australia are working together to finalise the publication and its release is expected at the end of 2011. In the meantime, while green feed is still available, cattle on phosphorus-deficient diets should be provided with a phosphorus supplement. This is crucial if producers wish to capitalise on the high protein and energy levels in the diet.

If in doubt about the phosphorus status of their cattle, producers can get a simple phosphorus test done in conjunction with a diet quality test to determine whether a supplement is required.

The revised book will include new and innovative ways to deliver phosphorus supplements and will include photos, graphs and case studies.

Désirée Jackson

Project Leader, Agri-Science Queensland, DEEDI

Longreach

Ph 07 4650 1223

Managing wynn cassia

In a year where there has been phenomenal pasture growth I have had reports of wynn cassia as high as the top wire. This has then led to discussion on its merits as a desirable pasture legume.

Chamaecrista rotundifolia cultivar 'wynn' cassia or round leaf cassia, originating from Brazil, was released for commercial use in Australia in 1984 as a pasture legume for tropical and sub-tropical grasslands. It was one of a number of cassia accessions trialled by CSIRO and it didn't kill rats. Many cassia species are known to be toxic, however wynn displayed all the characteristics needed to make a suitable forage legume. It was tolerant of low to moderate fertility soils, had rapid germination and growth, early flowering, high seed set, good ability to fix nitrogen and moderate palatability, which helps it to persist in a grazing environment.

Subsequent feeding trials supported this, where despite its low palatability, wynn cassia contributed to at least 16% of the diet and increased liveweight gains in yearling steers by 34 kg/head (40% improvement) on native pastures near Gin Gin in southern Queensland. In pen feeding trials at Brian Pastures Research Station near Gayndah, wynn cassia hay was readily eaten at levels up to 50% of the diet.

So we know it possesses good productive capabilities and can produce increased growth rates when sown into native pastures. However pure swards of wynn cassia pastures in the Douglas Daly area of the Northern Territory consistently provided less animal performance with liveweight gains 20–30% below alternative sown pastures under similar conditions. All grazing trials also noted that when cattle had an opportunity to select other species they generally did, especially in the growing season and early winter, preferring to graze wynn cassia later into the dry season.

So I guess this raises the point, which many of you are well aware of, too much wynn cassia in a pasture is not a desirable outcome. This poses a number of problems for grazing management. Firstly, it means wynn cassia is getting a competitive advantage by not being grazed during the growing season and then, combined with its early massive seed set, it creates plenty of competition for other species. Over time the continued grazing pressure on companion pastures species will reduce their ability to compete and the spiral continues.

In the Douglas Daly trials they found that heavy, early season grazing resulted in the loss of palatable grasses and led to a wynn cassia-dominant pasture. They also demonstrated that removing or reducing grazing pressure through the wet season promoted the re-establishment of grasses, allowing the palatable grasses a chance to set some seed.

So what are the options in wynn cassia-dominated pastures? One suggestion has been to spell early and then graze a little heavier later in the dry season. This heavier grazing can damage, and may take out, some of the larger mature wynn cassia plants. There will be plenty of seedlings to take their place but the early wet season spell will ensure they don't get any advantage. As always, make sure groundcover is maintained to take advantage of any rainfall and maintain soil condition.

In moderation, wynn cassia appears a desirable legume to augment our native pastures. It appears to fix a considerable amount of nitrogen and has been recorded increasing N concentration in associated speargrass by 20%. The critical factor is grazing management, especially wet season spelling, to maintain a healthy balance to control its tendency to dominate.

I would be really interested to hear other people's experiences and ideas with managing wynn cassia. If I get some responses I will provide a summary in a later edition of the Muster.

Karl McKellar

DEEDI Charters Towers

Ph 07 4761 5153

karl.mckellar@deedi.qld.gov.au

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Sulfur in supplements

Sulfur is an important component of our livestock nutrition, and is also a poison in excess.

Recently, I have seen situations where too much sulfur is being fed in both dry season and wet season licks. This is not a good practice.

Supplement price increases have resulted in the practice of reducing urea and increasing Gran-am percentages in dry licks in order to reduce costs. This is potentially dangerous. Excess sulfur intakes can be very harmful. There will be milder, unseen but harmful effects of excess sulfur before the level where major problems are evident.

Urea is fed at this time of year because cattle are on protein-deficient pastures and a protein supplement is needed. Urea is still the cheapest form of rumen degradable protein supplement we can use.

Where a protein supplement is needed, adult cattle still need 55–60 grams of urea per day, balanced with the correct amount of sulfur.

To reducing supplement costs you can:

- reduce non-essential ingredients in the lick
- supplement cattle that are likely to give an economic return to that supplement
- give targeted, but effective and balanced, supplements
- manage breeders to reduce the number of breeders feeding calves in the dry season
- segregate needy cattle from less needy cattle.

Regarding molasses mixes, under NO circumstances should Gran-am or sulfur be added.

Sulfur—too little or too much?

Sulfur plays an important role in cattle nutrition. It is a constituent of protein and is essential for microbial activity on protein, cellulose and starch in the rumen. Therefore, it plays an important role in protein, fat and carbohydrate metabolism.

For grazing cattle, grass is the main source of sulfur, especially when it is green. As pasture matures and the protein content of the grass falls, the intake of sulfur also declines.

Adding sulfur to supplements

Sulfur is required by the rumen microbes to form microbial protein. The animals' requirements for sulfur are usually met from pasture but when a source of nitrogen such as urea is added to the diet extra sulfur is usually required. This is usually done by adding Gran-am or elemental sulfur.

When adding sulfur to supplements or production mixes the amount of sulfur in the total diet should be

taken into account. Some water, especially bore water, can contain high levels of sulfur. Cattle require 1.5 g of sulfur per kg of dry matter.

The optimum ratio of nitrogen to sulfur for licks is 10N:1S. This can be achieved by adding Gran-am or elemental sulfur at the following rates:

- **Gran-am.** Gran-am should be added at a rate of one part Gran-am to five parts of urea.
- **Elemental sulfur.** Elemental sulfur should be added at a rate of one part sulfur to 20 parts urea.

If the lick contains a significant amount of protein meal further adjustments will need to be made to the sulfur level to balance the nitrogen:sulfur ratio.

Molasses contains significant levels of sulfur. Therefore it is NOT necessary and is actually risky to add extra sulphur even when urea is added.

What happens if cattle consume too much sulfur?

As Gran-am is very bitter it is sometimes included at higher levels to help to control intake. This can lead to excess intake of sulfur.

Adding extra sulfur to fortified molasses or grain mixes where intakes are high (2+ kg per day) can lead to severe problems and even death.

In cattle, large amounts of sulfur can lead to sulfur toxicosis, a permanent brain disability and death. The initial signs in the animal are restlessness, thrashing, kicking at the stomach, staggering, diarrhoea and muscular twitching.

There have been cases where deaths have occurred when excess levels of sulfur have been used in feeds to control intakes. In these instances Gran-am was added to molasses mixes, and Gran-am and/or magnesium sulfate was added to grain mixes, in an attempt to reduce intake.

Mineral imbalance

Undesirable secondary effects can also occur where there is an excess level of a mineral in a diet. These secondary effects can result in a deficiency in another mineral and/or reduced feed intake. Excess sulfur decreases copper retention and can precipitate a copper deficiency.

Excess levels of sulfur have been shown to result in reduced feed intake and reduced rumen motility.

The National Research Council suggests that ruminants should not be fed more than 0.4% sulfur (dry matter basis) to prevent reductions in intake (NRC, 1987). However, symptoms of a disease called PEM have been induced in cattle consuming diets with 0.4% sulfur (Gould et al., 1991).

PEM or Polioencephalomalacia is a disease condition

characterised by necrosis of the cerebrocortical region of the brain. Until we know more it may be safer to use lower levels, or work on 1.5 g of sulfur per kg dry matter.

Sulfur deficiency—where does it occur?

Basalt soils world-wide are often deficient in both sodium and sulfur. Sodium and sulfur are primarily deficiencies of the wet season, just as phosphorus is most limiting in the wet season on phosphorus-deficient soils. Mulga country is also deficient in sulfur.

The recommended supplement on basalt country for wet season salt and sulfur feeding is salt and 12%

sulfur by weight. Depending on the location, cattle will consume 50–60 grams of the mix per day. Intakes may be higher than this in the first few weeks of feeding.

Check with your local beef extension officer that the licks you are using are balanced.

Alan Laing

Senior Extension Officer (Beef), DEEDI, Ayr

Ph 07 4720 5115

Felicity Hamlyn-Hill

Senior Extension Officer (Beef), DEEDI Charters Towers

Ph 07 4761 5157

Copper deficiency in livestock

Copper deficiency has been diagnosed recently on properties along the Burdekin coastal strip. Other cases have also been diagnosed over the last twenty years. In one of the recent cases, the laboratory reported the results as the lowest seen for 30 years. Copper deficiency may be limiting cattle performance in undetected situations.

However, copper is also a poison in excess. Adding copper to cattle diets without diagnosing the problem can be very harmful.

Where does copper deficiency occur?

In eastern Australia, copper deficiency in cattle and sheep most commonly occurs on acid sandy soils, granite soils and peat swamps, particularly in areas of high rainfall.

Extended periods on green feed can induce copper deficiency where copper levels are marginal.

What are the symptoms in cattle?

Common symptoms are retardation of growth, failure to fatten, coarsening and depigmentation of hair (pale, harsh, dry coats), scouring (diarrhea) and anaemia. Fertility may also be reduced in breeding herds.

Other minerals also affect copper levels

High dietary intakes of molybdenum, sulfur, zinc, iron, cadmium and calcium have all been shown to decrease the availability of dietary copper to animals.

Molasses is well-endowed with sulfur. On susceptible landtypes, high intakes of molasses, with or without a calcium/phosphorous supplement, can lead to sulfur and calcium interference with copper levels available, particularly if animals are stressed.

High concentrations of molybdenum and/or sulfur in forage can induce copper deficiency in grazing animals. Conversely, high dietary copper, low

molybdenum and low sulfur may cause copper poisoning.

How do we test for copper deficiency?

Liver copper concentration from either deceased animals or meatworks cattle is one of the best indicators of copper status. From live animals, the best test is from a blood sample.

Pasture analysis provides only a rough guide to the copper status of grazing animals. A clinical response, seen as an improvement in health and production after copper supplementation, is a definite way of confirming copper deficiency in animals.

How do we treat copper deficiency?

Firstly, we need to realise that copper is a trace element, only required in a minute quantity. There is a narrow difference between copper deficiency and toxicity in animals.

Copper oxide needles are a slow-release form of copper, administered as a capsule into the rumen when caught in a head-bail. They are active for 6–12 months.

Drenches are available that last for up to a month. Copper sulfate can be supplied through licks and drinking water, but the dose rates cannot be controlled. Some animals can get too much and risk toxicity, while others, especially with licks, may get too little.

Injectable copper formulations are available for cattle, but not recommended for sheep. These injectable formulations cause carcass damage.

Overall the slow-release copper supplements given orally may be more effective than other treatments.

Summary

Copper deficiency is not widespread. However, where it does occur, it causes losses in production.

Alan Laing

Senior Extension Officer (Beef), DEEDI, Ayr

Ph 07 4720 5115

Cost-effective dry season supplementation

As the dry season progresses the nutritional value of the pasture deteriorates in terms of protein and energy. For cattle, the first major limiting nutrient is usually protein, without which utilisation of minerals (such as phosphorus) and also energy, is ineffective. Energy can also become limiting as the pasture becomes less digestible.

The following are some tips to assist with a cost effective supplementation program.

Determine the quality of the diet cattle are consuming so you can make informed decisions about if and when cattle require supplementation, when cattle may be likely to start losing weight, and balancing of supplements. The most accurate way to assess the quality of the diet cattle are consuming is to use NIRS faecal sampling. NIRS estimates:

- dietary crude protein (CP)
- dry matter digestibility (DMD)
- faecal nitrogen (N) concentration
- non-grass proportion of diet
- growth rate.

The information you supply (e.g. landtype, pastures, rainfall, frost events and animal class and level of production) along with the sample, will assist with the interpretation of the results.

Multiple sampling gives an indication of how quickly diet quality is deteriorating initially. Once supplementation has started further samples will assist with determining if the supplement is still suitable, given the current deficiencies of the pasture diet and the required production level of the cattle.

Symbio Alliance has been licensed by MLA to do NIRS analysis.

Contact: Liz Owens **Phone:** 07 3340 5702
Email: eowens@symbioalliance.com.au

Feed first-limiting nutrients. The most cost-effective supplements address first-limiting nutrients in targeted daily amounts. In the dry season, the first limiting nutrient is usually protein, followed by energy as the pasture digestibility deteriorates further. Urea is the cheapest source of non-protein nitrogen. The safest dry licks contain 25–30% (by weight) of urea. Any less and the lick may be too palatable and therefore dangerous. This is why it is recommended that the high urea level is fed straight off, after feeding salt for two weeks or longer (until dietary cravings are satisfied).

The recommended intakes for urea will be determined by the class and production requirements of the

cattle being fed and the NIRS result. This will give an indication of the protein shortfall. Weaners (150+ kg) may require 30–40 g urea per day depending on size, dietary shortfall and targeted growth rates.

A typical shortfall for dry pregnant cows may be corrected with 50 g urea/head/day, which supplies 144 g of protein. Under poor pasture conditions in the dry season, when crude protein levels determined by NIRS may be as low as 5%, the shortfall in dietary protein for a typical-size lactating cow may be as high as 450 g. A 30% urea supplement will only supply 172 g of protein if 200 g per day is consumed. So, for lactating cows it is difficult to fully correct this dry season protein shortfall with a urea dry lick. Management to reduce or eliminate dry season lactations is recommended (see below).

On deficient landtypes, phosphorus in dry season licks may be required for pregnant and lactating breeders and growing cattle. If unsure of the phosphorus requirements during the dry season check with your local beef extension officer, as a number of factors need to be taken into account.

Trace element deficiencies are rare in the north, except for coastal areas where copper deficiency may occur (see copper deficiency article on page 33).

The most effective supplement is one that is nutritionally balanced. Based on the required intake, a balanced supplement will provide adequate amounts of each nutrient, without costly excess of any nutrient.

The supplement should be nutritionally balanced in terms of nitrogen and sulfur (10N:1S). To ensure this balance, feed:

- Gram-am™ at one part Gram-am™ to five parts urea by weight **OR**
- Elemental sulfur at one part sulfur to 20 parts urea by weight.

For further information see sulfur article in this issue, on page 32.

If feeding phosphorus, then the percentage of phosphorus in the lick should be balanced to meet desired intakes. Calcium and phosphorus should also be balanced at a ratio of not more than 2:1. Excessive amounts of calcium can interfere with the uptake of phosphorus. Lime is not recommended in dry licks. Calcium in both the pasture and the phosphorus source supply more than the requirements cattle need.

The cost-effectiveness of a supplement should be based on the cost per unit nutrient (e.g. protein, phosphorus, energy), not the cost per tonne. Take note of the cost per unit of true protein for weaner feeds.

Monitor intakes to avoid unnecessarily high and costly intakes, or situations where cattle are just not getting enough. Determine what the recommended daily intakes are for the lick being fed. If the intakes are too high or too low, adjust the palatability accordingly. The level and type of protein meal, the source of sulfur

and phosphorus, the level of urea, the level of salt and molasses (if used), can be manipulated to control intakes.

Target supplementation only to those stock that most need it (e.g. lactating breeders and late pregnant breeders). Segregate cows according to calving time and hence nutritional demand. Dry cows, wet empty cows and wet pregnant cows will each have different nutritional requirements. This system reduces dry season supplementation costs by not having to feed all breeders.

Reduce feed requirements through good management. Weaning before cows start to lose condition removes the stress and high nutritional demands of lactation. Weaning is a critical component and is most easily managed in seasonally-mated herds.

Seasonal mating ensures breeders have calved at the start of the wet season and are lactating during the best period of nutrition. Correcting deficiencies for lactating cows in the dry season is quite difficult (and potentially

expensive) as shown by the example on page 34. Urea dry licks may not be able to supply enough protein to correct the shortfall in protein needed, due to the high requirements of lactation. Cows lactating in the dry season also require high levels of energy, which are not met through pasture consumption or dry licks. The resulting loss of body condition impacts on a cow's ability to cycle and get back in calf.

If unable to seasonally mate, pregnancy test and separate/identify and/or sell those cows that will calve at the wrong time of the year (i.e. the cows that have a high nutritional requirement at the driest time of the year).

All of the above strategies will contribute toward implementing a cost-effective and well-executed supplementary feeding program. This should be combined with sound grazing land management.

Felicity Hamlyn-Hill
Senior Beef Extension Officer
Ph 07 4761 5150

Grader grass alert

An invasive weed is causing havoc for graziers and other landholders in north Queensland, following a very wet season.

High rainfall has created perfect conditions for grader grass, a tall weed that grows in thick clumps and has the potential to dominate and degrade landscapes across northern Australia.

Natural resource management group NQ Dry Tropics has been receiving calls from concerned landholders who are alarmed at how quickly it has spread.

The grass is seeding now and turning a distinctive orange-red, which is why it's become noticeable to landholders. It grows to two metres in tufts, on cane-like stems.

Native to India, grader grass (*Themeda quadrivalvis*) can be mistaken for kangaroo grass and mature plants are unpalatable to stock. Once it takes hold, it's a difficult grass to control, spreads quickly and seeds prolifically.

Grader grass significantly changes the landscape and outcompetes native pasture and grass species. It has no value as stock feed. It also poses a high fire risk in the dry season because of its density, and quickly invades burnt and disturbed areas.

For isolated outbreaks landholders are advised to bag the head of seeded plants and destroy the seeds by burning in a safe area. Larger infestations

will require longterm strategic management and might require chemical control.

It's important to cause minimal disturbance to seeds. Whatever management is taken, follow up is critical.

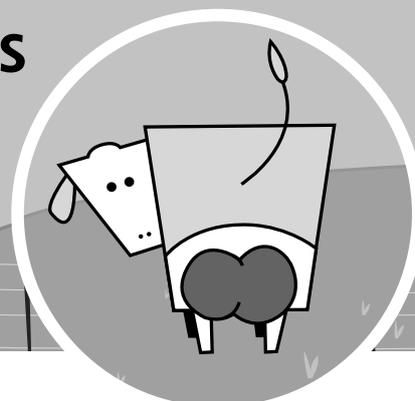
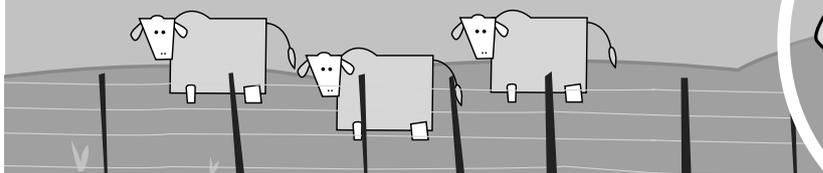
If you're driving in an area that has grader grass make sure you clean underneath vehicles and machinery to stop the spread of weed seeds. Avoid driving through weed patches and spreading the seeds further.

Landholders can find more information about controlling grader grass by visiting the NQ Dry Tropics' website www.nqdrytropics.com.au/grader-grass. To find the manual go to www.nqdrytropics.com.au/sites/default/files/Grader-Grass-Management-Guide.pdf

Amanda Laurie
NQ Dry Tropics
Ph 07 4722 5743



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