Northern muster

Information for rural business in North Queensland

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The wet season, as of late February, has again been disappointing across a lot of North Queensland, with a late start to any storms and patchy rain only across many districts. The northern dry tropics during the early part of the year had very little pasture butt with the poor rainfall totals. The lack of widespread rain has meant this growing season is going to be the third failure in a row for a lot of properties. The fundamentals of our beef market are still strong—the value of the Australian dollar, and demand from domestic and export end users. However, another poor summer growing season will see an oversupply of cattle putting downward pressure on prices going into autumn and winter.

AUSTRALIAN BEEF PRODUCTION

There has been record beef production in Australia throughout 2014, with an estimated 2.55 million tonnes of beef produced from 9.23m head processed. Figure 1 shows the breakdown of how the states performed, with Queensland leading the way. The total value of our export meat sales in 2014 reached a record $7.79 billion, with 1.287 million tonnes exported. Leading the way was the US, which took 397,889, with Japan ($5.415 billion) following. Figure 1 shows the other advanced countries that are key players in the Australian export meat sales in 2014. Live export numbers for 2014 were also at record highs with 1,294,000 head exported. Indonesia was by far our most important destination, taking 750,000 head, followed by Vietnam (181,000 head), Malaysia (54,000 head) and Philippines (26,000 head). Darwin again was the busiest live export port, shipping 541,000 head, followed by Townsville (247,000 head). Again, Australia is heavily reliant on its northeastern neighbours, as Asia-Pacific buyers paid $5.65 per cent for our live export cattle.

FEEDLOT SECTOR

In the December 2014 quarter, Australia had record numbers of cattle (about 965,000 head) in feedlots. This was no doubt due to the ongoing drought conditions experienced across eastern Australia. Feedlot turnoff numbers for 2014 were up to a total of 2.7m head. Queensland led the way, turning off 1,580,000 head, NSW 750,000 head and Victoria 600,000 head. Our 2014 feedlot beef numbers totalled 230,600, with the leading market, Japan, buying 130,600, followed by Korea (32,600) and the EU (16,400). There has been a lot of comment from Australian market analysts on cattle numbers available for slaughter and live export over the coming year. There is no doubt, with about 10m head aged per year over the past two drought years, there have been some serious inroads into cattle numbers. Dry conditions will also impact on branding rates across the northern dry tropics for some time yet. Add to this the large number of productive breeders slaughtered over this time period and potentially there may not be the numbers to meet expected domestic and export markets. On the other side of the fence, we have a northern beef industry in crisis, with the ongoing cost-price squeeze eliminating any profitable production for many years. Having many beef businesses with large debt and low equity levels. Lower cattle numbers across the north will lift individual animal productivity. If a reasonable growing season or two are experienced, with better management and continued decent prices, profitability may sneak back into northern beef properties.

The domestic beef retail marketplace over the past year has seen the usual figures for sales share. Woolworths claimed about 32pc of beef sales, followed by Coles (about 25pc), independent butchers (22pc), IGA (6.5pc) and the big improver Aldi (2.9pc). Aldi now has 350 stores across Australia and an estimated 10pc share of national grocery sales. Approximate average retail prices per kilogram in 2014 for Australian domestic protein sales were pork $11.29, lamb $11.25, beef $10.36 and chicken $8.26. Online retail sales continue to grow in Australia, with an estimated $16.2bn in sales last year. Department stores receive 34pc of sales, followed by homewares and appliances 11pc, and groceries and liquor 15pc.

AUS-MEAT LANGUAGE

A review is being conducted into the Aus-Meat language that has been used in the beef industry since the 1970s. Carcase descriptors such as dentition and butt shape are in the firing line, as there is now excellent MSA technology to determine eating quality. It is hoped the white paper being prepared will get processor and producer support. This should allow new technology to be introduced to improve our supply chain overall by better meeting consumer requirements. It would also provide meaningful feedback and payment systems to producers that reflect the product’s usefulness.

CHINA

An interesting trend in China meat sales is that 29pc of Australian sales into this market have been in beef or carcase form. This, no doubt, was to take advantage of the lower Chinese labour costs.

US

The good news from the most important 2014 customer is that projected US domestic beef production is forecasted to fall 5.2pc in 2015 to about 10.7mt. It is hoped this will equate to continued good demand and prices for Australian meat into 2015. Although market analysts early in 2015 had reported in the US there had been quite a big downwards trend in beef prices, especially for imported 90CL manufacturing beef. A positive trend is the increased demand for pasture-fed or beef produced off grass in US manufacturing beef. A positive trend is the increased demand for pasture-fed or beef produced off grass in restaurants and the fast-food segment. This can only be positive for Australian beef-export sales, with our PCAS production gaining momentum and JBS also running with a pasture-fed product from its southern Australian works. For the past 20 years, chicken production in the US (17.7mt last year) has led beef production totals, and in 2014 pork production also overtook beef with 10.5mt produced.

Australia’s single biggest beef customer, McDonald’s, has just reported a poor trading year worldwide with profits down by about 36pc. No doubt as the world’s leading food service provider, they will adapt products and marketing to turn this decline about.

INDONESIA

With a new government in place, there is again a big push for livestock self-sufficiency. This has immediately meant restrictions on some taxed beef lines and offal, except tongue and tail. Australia’s first-quarter live export quota of 96,000 head is also down 30pc on the numbers allowed for the same period in 2014. Boxed beef and offal sales into Indonesia totalled 74,000mt last year. Australia’s most important offal market is Japan, then Korea, Hong Kong and Indonesia.
Species compete

Growth of 3P grasses impacted where couch dominates

Indian couch

GRAZIERS and extension staff have been reporting a large expansion of Indian couch across the basalt land types for some time. However, up until recently, there was no quantitative data to confirm this. That is no longer the case.

A survey of 16 GQuar sites on basalt soils was conducted in April 2015 and May 2014. The GQuar rangefinder monitoring program was initiated in Queensland in 1999 to track soil and vegetation condition on grazed landscapes and 445 sites were established across the state. 70 are in the Dalrymple region. The historical data from this program has been invaluable to test the viracity of grazing and extension staff reports.

Frequency (presence or absence of a species within the quadrat), ground cover and plant counts were the key measurements recorded. One hundred quadrats (100cm x 100cm) were assessed at each GQuar site. This data has been collated for an upcoming research paper to be published in the near future.

There appears to be an important threshold of 70-80% Indian couch frequency at which 3P (perennial, palatable, stoloniferous grass) is vulnerable to invasion by Indian couch. Graziers reported numerous factors that appear important in the expansion of Indian couch. They noted that it first established in the more disturbed areas such as roadsides and around troughs and lick tubs, and then progressed into the more heavily grazed areas such as roadsides and around troughs and lick tubs, and then progressed into the more heavily grazed areas.

Both these areas are subjected to heavy preferential grazing. The difference between the two appears to be time. Indian couch was first recorded at the high cover site in 1997 while 2014 is the first recording at the low Indian couch cover site.

There appear to be several factors important to the expansion of Indian couch: presence of a seed source, disturbed ground for initial recruitment, drought, and grazing-weakened 3P plants that are then unable to compete for space with the aggressive invader. This can then become a cycle of decreasing 3Ps and a continuing increase in Indian couch.

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The $13 million provided by the federal government as the top up for the emergency water infrastructure rebate has now been fully allocated. Applications will continue to be eligible to receive the Queensland government rebates of up to 50 per cent. Contact your local OAF officer or 132 253 for further information.

To register to receive the online version of the Northern Muster, subscribe on the Future Beef website (www.futurebeef.com.au/resources/newsletters/) or by sending an email northernmuster@daf.qld.gov.au.

We hope you enjoy this issue and please contact the editorial team with any inquiries or feedback.

Jo Robertson, Melissa Holzwart and Melissa Fraser
Future Beef Team
Northern Muster Editors

WELCOME to the first issue of the Northern muster for 2015. This year is shaping up to be another big one for the northern beef industry with a number of great events planned. This year’s events kicked off with the inaugural Northern Beef Producer Expo in Charters Towers on March 6.

The event attracted more than 300 people with its focus on innovation and technology for northern beef producers. Beef Australia 2015, in Rockhampton in May, is set to be a premier event showcasing all facets of the Australian beef industry. Also from May 27-28, the Rotary PAQ Field Days will be held on the Atherton Tableland.

Other events to look out for in 2015 include: Richmond Field Days, June 12-13; Developing Northern Australia Conference in Townsville, July 20-22 (www.northeastau.org.au).

The facility has grown to assist with the delivery of quality soil and land resources information, including soil maps. A land resource assessment on Spyglass will enable researchers and facility staff to optimise the layout of fencing, laneways, water points and paddocks. This information is also critical for experimental design of future research trials and data obtained will provide valuable knowledge for surrounding properties.

There are two components to this survey work – traditional soil mapping and innovative digital soil mapping, which will supplement the traditional mapping. The traditional survey involves mapping soil types and creating a soil map for the entire property.

For grazing activities, mapping soils at a scale of 1:50,000 is considered appropriate. At this scale the minimum soil unit that can be defined is 5 hectares, with a minimum mapping feature width of 150m.

Digital soil mapping can be used to predict soil attributes from soil measurement and other spatial information such as digital elevation models, geophysical data and satellite imagery. This field of soil science has moved from being merely theoretical in the 1990s to now being an operational and functional branch of soil survey. The soil attributes relevant to grazing and animal research that are being mapped include soil moisture, depth, redness, pH and nutrients (e.g. phosphorus, potassium, nitrogen and organic carbon) and surface characteristics (e.g. texture, structure and surface condition). These attributes are modelled on a 100m x 100m grid size and produced at fixed depths down to 1m in depth across the entire property.

There are 142 soil sites described and/or sampled on Spyglass to date. The major soils of each land type will be fully characterized to support future research trials and management. This project links with pasture work at Spyglass where soil moisture, rainfall and pasture yield are being measured in different land types. These research projects will allow for the development of more accurate carrying capacity and land capability maps across the property.

Contact Jo Robertson, Mellissa Holzwart and Melissa Fraser
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Pregnancy performance

Tips on improving reproductive outcomes in northern beef herds

‘Reproductive performance 101’

WHAT IS THE BEST WAY TO IMPROVE A HERD’S PREGNANCY RATE?

There are a lot of reasons why females don’t conceive. However, the most influential factor is body condition score at calving. Cows should score three or better to ensure they cycle again six to eight weeks after calving.

WHY THE EMPHASIS ON THE PERFORMANCE OF YOUNG BREEDERS?

Irrespective of where you operate in Australia, the biggest challenge is to get good conception rates in first lactation cows. These breeders are trying to lactate and raise a calf while cutting teeth and growing. The more you look after them and lift their productivity the more you will improve your herd’s performance.

WHAT MIGHT CAUSE LOWER THAN EXPECTED WEANING RATES?

Lots of things, but the most important step is to pregnancy test (with foetal ageing) to determine when losses occur. After determining ‘when’, you can do the following.

- Focus on ‘why’. If you don’t pregnancy occur. After determining ‘when’, you can do the following.

- There are a lot of reasons why females don’t conceive. However, the most influential factor is body condition score at calving. Cows should score three or better to ensure they cycle again six to eight weeks after calving.

- Irrespective of where you operate in Australia, the biggest challenge is to get good conception rates in first lactation cows. These breeders are trying to lactate and raise a calf while cutting teeth and growing. The more you look after them and lift their productivity the more you will improve your herd’s performance.

- Pregnancy performance

- Losses after pregnancy diagnosis can be due to abortion and, if this is the case, these dry cows (not lactating) will usually be in better condition than those that lost a calf after calving. Collect blood samples to test for leptospirosis, test then you don’t know if the problem is a failure to conceive, early abortion or losses after pregnancy diagnosis. Losses after pregnancy diagnosis can be due to abortion and, if this is the case, these dry cows (not lactating) will usually be in better condition than those that lost a calf after calving.

- Pregnancy tests conducted between six and eight weeks after calving are the most reliable. If foetal ageing was done and individual records kept, work backwards to determine when losses may have occurred. Fertility, heatwaves, out-of-season calving, mustering events, or cold, wet snaps may have coincided with losses. Dog bites and injuries will indicate that wild dogs were an issue.

- If the losses occurred after branding then a simple count of calves and check of castration and dehorning details may point to problems with husbandry techniques and a lack of 3-in-1 vaccinations.

- WHY FOETAL AGE?

- Foetal ageing doesn’t just determine if a female is pregnant, it also determines how long for. Enterprises that can’t implement short joining periods because of seasonal variation or lack of bull control, can lift productivity and profitability by segregating their breeders according to when they will calve.

- It reduces supplementation costs, mating costs and calf losses, as no breeders are mated around calving time.

- It is a great tool to put selection pressure for fertility on maiden heifers and it provides additional valuable information as to the causes of poor reproductive performance.

WHEN IS THE BEST TIME TO CALVE?

It depends on property location and the target market for weaners. For the best reproductive results calving should occur six to eight weeks before the ‘green date’ – generally defined as the number of days after October 1 to achieve a 70% or better chance of surviving 10% of rain over a week.

- If your ‘green date’ is December 31 then your first calves should drop in the first week of November. Ideally, mating start three months earlier (i.e. February 1). However, maximum reproductive performance does not always equate to maximum profitability. Many producers opt for earlier joining dates to synchronise with their target markets.

- WHEN ARE HEIFERS READY TO JOIN?

- Heifers need to have reached their critical mating weight (weight at which 60% of them will conceive in six weeks). Unfortunately, it varies between and within breeds and has not been determined for Brahman in northern Australia. However, if it will be higher than the 334kg average weight at puberty (calculated from Beef CRC data), Age and weight at puberty is highly heritable and rapid genetic improvement can be made in this area. If reproductive performance is an issue over-mate your heifers and select those (with consideration to temperament) that became pregnant in the first two cycles of joining. The results may surprise you as some of the younger, smaller heifers may be in the chosen replacements.

- WHY IS IDENTIFYING EARLY CONCEIVERS IMPORTANT?

- Heifers that conceive at the ‘right’ time first have the best chance of getting back in call the following year. If you simply put no pressure on your heifers and join for four months without foetal ageing then, on the surface, a pregnancy rate of 90% may appear to be a good result.

- But what chance do those heifers have of getting back in call if they only conceived at the end of the joining period?

- Animals that conceive early are valuable because the age of puberty is highly heritable and is linked to lifetime reproductive performance. If you are breeding your own bulls, and fertility is of the utmost importance, then you only want to keep potential sires out of cows that re-conceived earlier and have produced a calf every year.

- What can be done to ensure heifers are ready to join at the start of the wet season? Plan ahead. Just don’t put them back in the paddock and forget about them – they are future performers in your team.

- If you are in an acutely phosphorous-deficient region give P supplementation during the wet season the year before as this will lift growth rates by 40-60kg. Growth rates can also be boosted by reducing stocking rates and/or supplementing with protein meal prior to joining.

- Is there any advantage to mating heifers earlier than the main herd?

- Rather than mating them with the main herd you could put the bulls with them a month earlier. This group is under the most nutritional stress because they are still growing and this practice gives them more of a chance to get back in call the following year. However, it also means that you have to achieve your target weights an extra month earlier than the green date, and this may not be feasible or cost effective in many environments.

- HOW DO YOU DECIDE IF YEARLING MATING IS AN OPTION?

- While yearling mating is usually the single biggest management practice a producer can use to lift profitability it is not an option for everyone.

- Firstly, your country needs to be able to achieve growth rates of more than 150kg/year regularly and weaning weights of more than 240kg, otherwise the feed inputs are too expensive and re-conception rates are often low if supplementary feed is not continued. It is a great tool to put selection pressure for fertility on maiden heifers and it provides additional valuable information as to the causes of poor reproductive performance.

- To improve herd fertility buy bulls with average breed average estimated breeding values for reproduction (days-to-calling and scrollup/circumference) and make sure they come with a bull breeding soundness examination (BBSE) certificate. Before putting bulls out, conduct a BBSE.


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Weighing cattle

HOW much attention do you pay to how you weigh your cattle? We know how important liveweight gain is to profit in the beef business.

When monitoring liveweight gain, we need to be aware that how cattle are weighed can affect the reliability and accuracy of records produced.

As seen in the graph, if a 500kg steer is mustered in from the paddock and kept on a dry curfew (i.e. locked off feed and water) he will start to lose weight in the form of water, mainly through urination, defecation and breathing. Past research has shown that on a dry curfew, under comfortable conditions, cattle lose 0.3 per cent of their live weight per hour. Therefore, if this steer is kept under a dry curfew for 10 hours, losing weight at a rate of 0.3pc/hour, the steer will lose a total of 15kg. After being yarded and held under a dry curfew for 20 hours, the steer will lose 30kg.

Though often used interchangeably, the words accuracy and precision have different meanings. The graph emphasises that we can be as precise as we want, for example by using highly precise scales to record liveweights to the closest 100 grams. However, in reality there is no point having precise liveweight measurement without accurate liveweight measurement. Accurate liveweight measurement means having scales set up and zeroed correctly and knowing that the cattle being weighed are representative of their actual weight (e.g. not having lost a great quantity of weight through water as described above). As the saying goes, “it is better to be roughly right than exactly wrong”. But how is this relevant to your business? Let us use an example on monitoring the liveweight gain of steers:

On the first muster, 100 steers were weighed with little delay after mustering, with our example steer weighing 300kg. At this weighing, the 100 steers had a relatively full digestive tract (most of this being water), given that they had not long been off feed and water. A month later, the same mob of steers was mustered in by 5pm on the day prior to weighing day. When our same example steer was weighed at 7am the following day, he was 314kg. However, the steer had lost around 13kg in gut fill overnight by that time. That is a loss of 0.3pc of his liveweight per hour as the steer was locked off feed and water (i.e. dry curfew).

If the overnight weight loss was not taken into consideration, the steer’s weight gain between muster on 15kg. After being yarded and held under a dry curfew for 20 hours, this steer will lose 30kg.

Past research has shown that on a dry curfew under comfortable conditions, cattle lose 0.3 per cent of their live weight per hour. Therefore, after being yarded and held under a dry curfew for 20 hours, this steer will lose 30kg.

For a more accurate representation of how much weight the steer had actually gained (e.g. in muscle and breathing) as described in the table.

Past research has shown that on a dry curfew under comfortable conditions, cattle lose 0.3 per cent of their live weight per hour. Therefore, after being yarded and held under a dry curfew for 20 hours, this steer will lose 30kg.

Accurate liveweight measurement means having scales setup and zeroed correctly and knowing that the cattle being weighed are representative of their actual weight. This is to account for the fact that cattle, being creatures of routine, have similar feeding and watering patterns from day to day and, therefore, will have a similar amount of gut fill at a certain time of day. A high stress level in cattle will lead to a greater loss in liveweight. Good practices to reduce stress include avoiding over or under-crowding (making it difficult for animals to balance) during trucking and avoiding mixing animals with strangers, which disturbs their social dynamics.

Not surprisingly, working cattle in cooler weather means less weight loss (i.e. reduced water loss from animals) as described in the table.

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Multiple factors at play in arriving at accurate readings

### Muster 1.

<table>
<thead>
<tr>
<th>Full weight</th>
<th>Adjustment factor</th>
<th>Readout</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 kg</td>
<td></td>
<td>300 kg</td>
</tr>
</tbody>
</table>

Accurate liveweight measurement means having scales setup and zeroed correctly and knowing that the cattle being weighed are representative of their actual weight.

### Muster 2.

<table>
<thead>
<tr>
<th>Weight if steer was full</th>
<th>Readout</th>
</tr>
</thead>
<tbody>
<tr>
<td>327 kg</td>
<td>314 kg</td>
</tr>
</tbody>
</table>

This is a more accurate representation of the steer’s weight. It is easy to see that across large mobs, accuracy of liveweight records are important, given how the information may be used when making management and financial decisions in the business.

If the mustering and weighing schedule was consistent (for example, if steers were mustered in the morning and weighed soon after for each muster) the information generated from a sound set of records would be both precise and accurate.

Mustering in and leaving cattle on water overnight (i.e. wet curfew) may be a more suitable form of water, mainly through urination, defecation and breathing. Past research has shown that on a dry curfew, under comfortable conditions, cattle lose 0.3 per cent of their live weight per hour. Therefore, after being yarded and held under a dry curfew for 20 hours, this steer will lose 30kg.

Weighing cattle and having a consistent weighing protocol is not only important in monitoring overall herd progress and identifying the low and high performing animals. It is also important when it comes to sale time, to gain a more accurate idea of what cattle will weigh after a night on curfew in the saleyards or when calculating what the next cheque from the meatworks may be.

The following example demonstrates how adjustments may be used if consistent weighing protocols between musters are not possible.

If consistent weighing protocol is not possible then the adjustment factors provided in the table may be used.

It is recommended that if cattle are not mustered on dry curfew directly after feeding and watering that their weights should be adjusted upwards by a factor depending on the circumstances described in the table.

When planning to keep a weighing protocol consistent between musters, it is possible, cattle should be mustered in and weighed at around the same time of the day.

Accurate liveweight measurement means having scales setup and zeroed correctly and knowing that the cattle being weighed are representative of their actual weight.

### Guidelines adapted from weighing protocol research by Fordyce et al. 2008.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Adjustment factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet curfew</td>
<td>Add 0.05% per hour</td>
</tr>
<tr>
<td>Dry curfew</td>
<td>Add 0.05% per hour</td>
</tr>
</tbody>
</table>

Accurate liveweight measurement means having scales setup and zeroed correctly and knowing that the cattle being weighed are representative of their actual weight.

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23 April 2015 NQR | FUTURE BEEF NORTHERN MUSTER 19
Nitrate under study as alternative to urea

Feed supplement research

RUMINANT methane emissions account for about 10 per cent of Australia’s total greenhouse gas emissions. In 2012, Meat & Livestock Australia implemented the National Livestock Methane Programme to develop a strategy to reduce methane emissions from livestock while boosting productivity.

One aspect of this program assesses the suitability of replacing urea supplements with nitrate to reduce emissions.

Projects led by the University of New England and Ridley AgProducts are investigating this issue. This article summarises the information from these projects to date.

Nitrogen is often the primary limiting nutrient in the low quality tropical forages of northern Australia. Sufficient dietary nitrogen is required to promote rumen microbe growth, microbial protein synthesis and rumen fermentation.

Consequently, it is common for graziers to supplement cattle with urea during the dry season to provide non-protein nitrogen in the diet. This increases pasture intake and therefore liveweight performance.

Although urea supplementation is not only economically and environmentally expensive, it is often practical and economically feasible to reduce methane emissions from ruminants by replacing supplementary urea with nitrate salts.

Several studies indicate that introducing nitrate into the rumen can:

- Take the place of urea by providing ammonia for microbial growth, and
- Reduce methane production by cattle by about 21-30 per cent.

Projects have largely studied the application of nitrate in sheep and dairy cattle. Until now there has been minimal investigation into using nitrate supplements in low digestibility diets of beef cattle.

Nitrate can be toxic to cattle. After it is eaten, nitrate is converted to nitrite which is then converted to ammonia. Rumen microbes use ammonia to make protein. In situations where excess nitrate is fed, accumulation of nitrite compounds exceeds the conversion rate of nitrate to ammonia.

This can lead to nitrite toxicity where excess nitrate is absorbed across the rumen wall into the blood where it reduces oxygen transport around the body. It is generally accepted that toxicity occurs when nitrate concentrations in the diet exceed 3g/kg of dry matter. The situation is more complex than this, however, as the following variables also influence the extent of toxicity:

- Rate of nitrate intake.
- Rate of feed digestion and the subsequent release of nitrate.
- Rate of conversion of nitrite to ammonia in the rumen.
- Rate at which nitrite passes through the rumen.
- Feed type and dietary composition.

As expected, yield estimates varied between operators, with some large variations at some sites.

As a concern this is the variability that could be reduced through training and an improved set of pasture photo standards.

Land type did not play a role or influence the accuracy of visually estimating pasture yield. There was a tendency for operators to overestimate the amount of forage present when actual yields were low (< 1000kg DM/ha) but beyond this amount operators tended to underestimate yield as actual yield increased.

As examples, one low site with actual yield of 5500kg DM/ha was visually assessed by operators on average as 11000kg DM/ha and one high site with actual yield of 3800kg DM/ha was visually assessed on average as 2850kg DM/ha. The implications of these findings include the risk of overstocking when forage budgets are made for paddocks with lower yielding pasture and under-utilising feed when available forage is plentiful.

The bottom line is that while some error can be associated with visual estimates of pasture yield, forage budgeting is the only practical way at present to estimate the short-term (dry season) stocking rate in large paddocks. However, stocking rates calculated from these estimates are only ballpark figures, not highly accurate estimates of the exact number of stock a paddock can carry.

Continuous monitoring of grazing during the budget period is required by graziers, and adjustments made accordingly.

The next stages of this research will involve a number of activities including:

- Improving the available pasture photo standards; visual assessments can be straightforward but how accurate are they? Are they affected by land type? How much do operators vary in their yield assessment of the same site?
- Undertaking a forage budget is simple:
  - Step 1 involves visually estimating pasture yield using photo standards.
  - Step 2 involves calculating available pasture and feed demands per hectare to work out how many stock can be carried and for how long. This can be done easily using the Stocktake program, which is now also available as an app for smart devices.
  - Step 3 involves making a management decision on whether stock numbers need to be adjusted and how this will be done.

The situation is more complex than this, however, as the following variables also influence the extent of toxicity:

- Rate of feed digestion and the subsequent release of nitrate.
- Rate of conversion of nitrite to ammonia in the rumen.
- Feed type and dietary composition.
- Variability in animal response to nitrate.

As noted above, studies show feeding a given dose of nitrate over two or more feeding events is less likely to have ill-effects than if the same dose of nitrate is fed in a single bolus.

Further, feeding nitrate as part of a total mixed ration or pelleted grain diet or with eaten hay results in significantly lower concentrations of methaemoglobin than if single doses of nitrate are administered in isolation.

Incorporating grain concentrates into a diet supplemented with nitrate reduces the incidence of nitrate toxicity.

Higher digestibility diets have an increased conversion rate of nitrate and nitrite to ammonia so toxicity is less likely to occur. More research is needed to fully understand the effects of diet digestibility. As molasses mixes and low-intake lick products and blocks are the most commonly used delivery system for non-protein nitrogen supplements in northern Australia, it would be appropriate to feed nitrate the same way.

It is important to consider there is little control over the rate of nitrate intake in these free-choice situations and therefore a higher chance that some cattle may experience toxicity.

In feedlot situations, it is possible to more intensively manage nitrate intake, so tighter control can be exercised over the negative effects associated with higher levels of dietary nitrate.

The current research is likely to give a better indication as to whether nitrate is a safe and productive alternative to urea and so, at what dosage.

Financial considerations ultimately drive many business decisions and in this case, nitrate salts are lower in nitrogen content than urea. Thus the daily feeding cost is likely to be significantly greater (about 2.5 times) than the current practice of feeding urea-based supplements about any expected improvement in animal productivity.

The return of feeding nitrate supplements needs to consider the price received for methane abatement under any approved feeding methodology that results from this research.


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SavannaPlan-BeefSense

WITH a wet season that has so far been patchy at best, it is a good time for Northern Gulf producers to start assessing their options for the year ahead.

For many families the constant seasonal, debt and cost-price pressures can feel overwhelming. Trying to make cost-effective improvements when things are tough is not easy.

But, at the risk of missing up an old saying, "If you want a different outcome, you have to do something different to achieve that different outcome".

One way to start that change process is to take a good hard look at your books and broader financial situation to identify your options for change.

The next step is then to implement the selected options to truly ‘do something different’ and achieve change.

Under SavannaPlan-BeefSense the FutureBeef Team, Northern Gulf Resource Management Group, Southern Gulf Catchments and Agribusiness consultants Alison Lardar and Ian Mactlean have all joined forces to assist producers through this process.

As explained in previous editions of the Northern Muster, the teams approach to delivering SavannaPlan-BeefSense ensures a thorough analysis of your operation. While many consultants can often only offer advice within their narrow field of expertise, SavannaPlan-BeefSense has the luxury of accessing the knowledge of beef industry professionals experienced in the areas of financial, herd and grazing management components of northern cattle businesses.

A free service delivered on-property using an appropriate confidentiality agreement, SavannaPlan-BeefSense includes all aspects of running a profitable beef business ranging from breeder productivity and stocking rates through to cash flow budgeting, debt management and marketing.

With 16 months now under our belts, SavannaPlan-BeefSense in the Northern Gulf has worked with 20 clients working 34 properties across 862,000 hectares and running 75,000 head of cattle.

This equates to about $190 million in assets. Approximately $77 million in debt is secured against these assets.

With equity levels for this group averaging around 50 per cent, it is little wonder that a considerable part of our time working with clients is involved in looking at options and strategies for dealing with debt.

With the interest bill generally being the biggest annual expense, clients have to do everything they can to save interest. We have also come across many families caught on high fixed interest rates.

Even if you think your interest rate is reasonably good, it is always worth checking by getting quotes from other lenders.

Also, relatively few people have secured a QRAA-administered concessional loan.

If you have not done so it, it is worth checking your eligibility. Take a look at the QRAA website (www.qraa.qld.gov.au) or call 1800 623 946.

There are many things we can assist you with under SavannaPlan-BeefSense, so do not be shy to make contact and ask to be involved.

Recently, one client told us of his mother’s response to the figures we had worked up. She said ‘this is what we have always needed; this is what has been missing’.

Business analysis does not have to be daunting or involve dozens of hours spent crunching meaningless numbers. It is about trying to get a better understanding of your financial position and what this means for your future.

Business analysis is even more valuable when fully integrated with practical herd and grazing management knowledge.

Our team has a genuine interest in the industry and the well-being and financial success of the people in it.

If you are interested in being involved in SavannaPlan-BeefSense please contact any member of the delivery team.

For further information about SavannaPlan-BeefSense please contact any member of the delivery team.

Climate change adaptation has been a priority for many families caught on high fixed interest rates.

Even if you think your interest rate is reasonably good, it is always worth checking by getting quotes from other lenders.

Also, relatively few people have secured a QRAA-administered concessional loan.

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Cash Cow info days

Recent Future Beef breeder production information days held at Nanrius Station, Clermont, and the Emerald Agricultural College provided beef producers in central Queensland with an introduction to a process to better understand their breeder operation.

Leaders of MLA’s Cash Cow project presented key findings from the research, which collected information on 70,000 cows across 72 properties in northern Australia over four years.

Cash Cow project team Dr Geoff Forde (Queensland Alliance for Agriculture and Food Innovation, University of Queensland), Professor Michael McGowan (School of Veterinary Science, UQ) and Dr David Smith (Department of Agriculture and Fisheries) discussed key factors influencing performance, and showed producers simple ways to assess the productivity and performance of their herd, and how to identify areas for improvement.

Michael started the day by providing an overview of the Cash Cow project. He explained that at the beginning, the Cash Cow project sought to answer two fundamental questions:

1. Why do some cows become pregnant quickly after calving while others take significantly longer, or fail to become pregnant?

2. Why do some pregnant cows successfully wean their calf while others fail to do so?

Michael explained that a practical measure of reproductive efficiency was the percentage of cows likely to wean a calf in consecutive years. He said this was often quoted as a 12-month inter-calving interval. However, for a Bos Indicus cow to achieve a 12-month inter-calving interval, the cow must become pregnant within 2-5 months of calving.

Michael said that large beef-breeding studies conducted in the past showed that despite best management practices, only a very low percentage of cows in the northern Australian environment could achieve and maintain a 12 month inter-calving interval throughout the duration of their breeding life.

New measures of performance were developed through the Cash Cow project to determine the percentage of lactating cows that become pregnant within four months of calving. Michael said this was a measure of the proportion of cows likely to wean a calf in consecutive years.

Michael said the Cash Cow project found that one of the major factors affecting the percentage of lactating cows that become pregnant within four months of calving was the effect of time of calving. Cows that calved from July to September had a 49 per cent lower chance of being pregnant within four months of calving than those that calved from October to December. However, after all factors were considered, country type had the biggest impact. The percentage of cows pregnant within four months in the northern forest region within the study was estimated to be 38pc, 47pc, and 59pc lower than that of the northern downs, central forest and southern forest regions respectively.

2. Why do some pregnant cows successfully wean their calf while others fail to do so?

Michael went on to explain that the Cash Cow project also aimed to better understand the factors affecting the percentage of fetal and calf losses occurring between confirmed pregnancy and weaning.

The results from the study showed that again, country type influenced the level of fetal and calf loss, with the percentage loss in the central forest, northern downs and northern forest being respectively 4pc, 2pc and 7pc higher than in the southern forest.

He said the study also showed that the reproductive history of the cow affected the risk of fetal and calf loss, with percentage loss 4pc higher in those that did not lactate the previous year. Michael said when all other factors were taken into account, percentage loss in heifers was 2pc higher in mature cows. The study therefore confirmed the need to manage pregnant heifers and first-lactation females separately.

Throughout the study, Michael said he was also found that fetal and calf loss was 8pc higher where mothering efficiency was less than 90pc. Mustering around the time of calving was found to increase fetal and calf loss by 8pc, and heat stress during the month of calving also contributed to losses.

As with the ability of cows to become pregnant within four months of calving, overall nutrition and grazing management also impacted fetal calf loss.

Michael said that inadequate pasture production during the dry season prior to calving resulted in a 4pc higher fetal calf loss throughout the study. The project also found that the wet-season phosphorus status and cow body condition score at the pregnancy diagnosis must influence fetal and calf loss.

Michael discussed that during the course of the project, a holistic approach was developed that focused on answering the question: ‘How is a herd performing in relation to what is practically achievable in a specific environment?’

Geoffry and David challenged producers to ask the following questions:

More than 100 people attended the information days held at Nanrius Station, Clermont, and the Emerald Agricultural College to hear about factors influencing performance and production, and steps to improve reproductive efficiency and right questions: ‘Is my beef-breeding herd producing and as profitable as it could be in this situation? If not, what performance is below par and why?’

David showed producers simple ways to measure how a herd is performing. He explained that in order to complete herd and business analysis, beef businesses must start accurately counting cattle and recording the information in a basic annual livestock inventory.

“It doesn’t need to be complicated. All producers need an opening and closing inventory that is a count of all cattle by class, by weight, by value. This basic information can provide some powerful answers to the right questions being asked,” he said.

David said the project developed regional benchmarks that allowed a direct comparison to be made between individual herd production benchmarks and aggregated regional ‘achievable’ benchmarks. These production benchmarks provide an indication of where inefficiencies may be occurring within the breeder operation, and allow for specific diagnosis of potential problem areas. Basic mob-level information is needed for herd and business analysis.

David said the fundamental data to record was:

● The end of the cattle year – this varies across regions and situations. However, it is usually after the final weaning for the year and is critical to identify as it is used for the closing/opening date.

● Closing and/or opening accounts of numbers and average weight x class (gender x age).

● Branding numbers x gender as it is done.

● Details of all transactions (sales, purchases) and spaying/culls.

SUMMARY OF FINANCIAL ACCOUNTING

Geoffry then explained to the producers that in order to change performance and thus production, there were steps and actions to follow.

He said step one was to manage the feed base. ‘You cannot make something from nothing.’

Geoffry spoke of the importance of matching stock numbers to available feed, and controlling and managing the situation accordingly. Another critical action was to manage lactation. ‘Manage weaning using cow condition, not calf growth.’

Finally, Geoffry spoke of the need to manage breeding. ‘Use bulls that pass a bull-breeding soundness evaluation on Australian Cattle Vet standards; mate no more than 2.5pc bull select bulls; select bulls at what an average scrotal circumference for the breed type and live weight, and a high per cent normal sperm.’

He said it important to select bulls from dams that had weaned a calf from their first two mating opportunities, as these were all highly fertile traits.

At the Nanrius Station breeder-production information day, producers received an update from local veterinarian Dr Alan Guilfoyle.

Alan discussed cases of ketosis he had treated. He said ketosis was associated with an inadequate supply of nutrients necessary for normal carbohydrate and fat metabolism – often seen in times of high milk production during early lactation.

It leads to excessive amounts of ketone bodies in the bloodstream that come from the breakdown of fat when the animal is forced to draw on its body stores for energy. He said ketosis occurred when the grass was drying off and green feed was scarce. It is a condition often unnoticed in its mild form. The disease is usually seen in early lactation and can cause significant production losses. Alan reiterated the importance of managing the nutrition of lactating breeders.

DAF is co-ordinating a project that aims to work with producers to develop a standardised recording system for beef businesses that addresses inefficiencies in current systems, and provides data for herd and business assessment. The information data sought initial interest from producers.

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GUARANTEED ANALYSIS

Macro Ingredients

- Total Protein: 86.25%
- Crude Protein (form urea): 86.25%
- Salt (NaCl): 40%
- Urea: 30%
- Molasses: 2%
- Phosphorus: 2%-2.4%
- Min Iron: 0.20%
- Min Magnesium: 0.56%
- Activated Zeolite: 5.00%

Olsson’s NT UrAPHOS
A protein supplement with phosphorus to maximise the utilisation of day pasture.

High protein 86.25% Hard Block
Ideal For Dry Feed

Safe feeding with infused Zeolite & Phosphorus

GUARANTEED ANALYSIS

- Total Protein: 86.25%
- Crude Protein (form urea): 86.25%
- Salt (NaCl): 40%
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- Min Iron: 0.20%
- Min Magnesium: 0.56%
- Activated Zeolite: 5.00%
Enhancing MSA’s value in supply chain

Providing more meaningful feedback on eating quality

**MSA Optimisation**

Now that all processors in north Queensland have implemented the MSA Optimisation system, producers may notice the inclusion of an MSA Index on feedback sheets, which can also be accessed through a new MSA feedback portal. MLA is using these three initiatives to enhance the value of MSA across the supply chain.

1. **MSA INDEX**

   The MSA Index is a single value from 30 to 80 applied to a carcase to represent the potential eating quality value of that carcase. Higher index values indicate higher eating quality. In 2014 the average MSA index nationally was 57.28, 0.52 index points over the preceding 12 months. This is a significant increase in the average eating quality of beef in Australia.

   The MSA Index is intended to provide more meaningful feedback so that producers can see how their management decisions affect the potential eating quality, and get a feel for the impact some of their on-farm analysis, including tracking trends over time.

2. **OPTIMISATION**

   

   The ability to do more advanced customised analysis, including tracking trends over time. "I would encourage producers to use the MSA Index calculator in myMSA or on their smart devices and get a feel for the impact some of their on-farm decisions can make on eating quality," Terry said.

3. **OBSERVATION**

   The other change producers may notice is the removal of the national MSA boning groups (1-18) to allow for the more flexible and efficient MSA Optimisation system.

   The boning group system required the eating quality calculation of all 136 cut × cook method combinations predicted by the MSA model. These can be considered as hurdles that a carcase must jump over to achieve an MSA boning group. This is regardless of whether the processor packs and markets all of these products.

   "MSA Optimisation allows the processors and brand owners to focus on the cuts that are most important to their markets or customers, and determine the cut × cook hurdles they want to use in a carcase-sorting system," Terry said.

   The MSA grading standards and the underpinning science of the MSA model have not changed for MSA Optimisation.

   MSA Optimisation also does not require any additional requirements for livestock consignment and the current MSA minimum requirements remain the same, in that carcases must have:

   - Minimum 3mm rib fat and adequate fat distribution over all major primals.
   - Meat pH lower than 5.71.
   - Meat colour 1B-3.

   More information about the MSA Index can be found in a new tip & tool available to download at www.mla.com.au/msa.

   The new MSA member feedback tool, myMSA, is found in a new ‘tip & tool’ available to download at www.mysma.com.au/msm.

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   The MSA Index calculator can be used on your smart device at http://mysma.com.au/msm.

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   Scan this symbol to use the MSA Index calculator.

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Activities and performance update

The Clermont Cattlemen’s Challenge is again proving to be of great interest to the district’s cattle producers. It is an integral part of the Clermont Show, as it runs over 12 months from show to show. The challenge has seven components over the 12-month period, with each entry being a pen of five weaner steers. The steers were delivered to the Clermont Showgrounds on May 25, 2014. The steers were fed hay and kept on water before weighing on the morning of May 27 without a curtail. Average weight across the 75 steers was 295kg (range 250 to 326kg). The heaviest pen of steers averaged 334kg and the lightest 238kg.

WEANER JUDGING

The steers were judged as stores most suitable for growing out for the 100-day grainfed market. Greg and Alison Pugh from 91M gained the maximum points in the weaner judging (5 points), followed by Callard Park (4 points), Wyena (3 points), Treeland (2 points) and Menringa (1 point).

GRASS PHASE

On May 27, 2014, the steers were transported to Ted and Jenny Murphy’s property Tay-Glen, Dysart. They received health treatments (botulism, 5-in-1 and Dectomax) and a Compudose 400 implant. The cattle were grazed as one mob in a 303-hectare (750-acre) paddock for 255 days (to February 6, 2015). Buffel grass was the predominant pasture, with some native grasses and legumes. The paddock had been grazed as one mob in a 303-hectare (750-acre) paddock for 255 days (to February 6, 2015). The stocking rate in the challenge paddock ranged from 6.2ha/adult equivalent at the start of the grass phase to 4.2/AE at its conclusion (see Table 1).

The range between pens was 69 kg/ha to 136 kg/ha (range 65.9 to 136.8 kg/ha) with 98% of pens within the range 70 to 125 kg/ha. The heaviest pen of steers averaged 334kg and the lightest 238kg. Weaning strategies for production'.

Dietary crude protein, dry matter digestibility and rainfall of the grass phase of the Clermont Cattlemen’s Challenge 2014/15.

Steers on February 6, 2015, immediately prior to transportation to the feedlot.

DIET QUALITY

Faecal NIRS was used to monitor diet quality during the grass phase. The quality of the diet remained high during the grass phase (see graph). Dietary crude protein averaged 6.8% per cent during the dry season (range 6.4 to 7.9%) and increased to 8.5% in February. Maintenance levels for Bos-Indicus derived cattle are 4.5 to 5% for dry cattle and 7% for pre weaned stock. The range can be from 4pc or less for dry, mature pasture to 70pc for fresh, young pasture. Dietary dry matter digestibility, an indication of the energy value of the diet, averaged 56% during the dry season (range 52 to 54%) and increased to 56% in February. Wet cows require about 55pc digestibility to maintain condition and dry cattle closer to 50pc.

FEEDLOT PHASE

The steers were transported to Parinnga Feedlot, Capella, on February 6, 2015. They were fed hay and a grain ration in a holding yard for five days before induction on February 11. Average weight at induction was 437kg (+2kg from average weight at the end of the grass phase). The heaviest pen of steers averaged 488kg and the lightest 346kg. The steers will be grain fed for 100 days.

FIELD DAYS: TAY-GLEN

A field day and barbecue was held at Tay-Glen on November 24, 2014, to inspect and weigh the growing steers. Guest speakers included DAF’s Paul Jones and Jim Fletcher, who respectively discussed Wet-season spelling – latest research and recommendations and ‘Weaning strategies for production’.

To better understand the growth performance and diet quality of the steers, Ted Murphy guided the group on a tour through theapitan management. Discussions among the group included the history of the property and paddock; current condition of the paddock and pasture; and local issues and land-management strategies.

SAVE THE DATE: PARINGA

A field day will be held at Parinnga Feedlot, Capella, on Friday, May 15, 2015. Activities will include selection of steers for show classes, selection of steers for carcase judging, guest the winning carcase steers competition, guest speakers and a barbecue lunch.

Biological control agent

A LEAF-FEEDING hopper caterpillar – Euxanthis cisplatensis or UU for short – is the latest biological control agent being used to fight the thirsty weed parkinsonia (Parkinsonia aculeata) and is looking like it will make its mark in Queensland. UU is from Argentina and feeds on the leaves and leaves and foliage of this weed of national significance, defoliating the plant. This reduces the plant’s vigour and growth, making it susceptible to disease and reducing seed production, helping to reduce its invasiveness in watercourses, floodplains and grasslands in northern Australia.

Releases of UU began in early 2015 in northern Queensland – from the naringa colony based at the Department of Agriculture and Fisheries’ Tropical Weeds Research Centre, Charter’s Towers – and they haven’t looked back. More than 400,000 UUs have been released since. Release sites in north Queensland include the Burt, Tullyville, Tully and Cape regions. Central Queensland sites include Emerald, Clermont, Middletown and the Fitzroy areas.

Pupa is the main life-stage of releases, with the UU housed in a ‘trap’ hanging with a patch of parkinsonia. Adults emerge as moths and mate, with the female averaging 60 to 100 eggs in her short life. The larvae feed voraciously throughout their three-week life stage, before pupating on a stem or leaf midrib. The larvae are hard to see due to their amazing camouflage technique of blending into the leaf structure. Their bright green body lies flat along the leaf midrib or stands to attention to look like a Thom.

UU releases have recently been complemented with the introduction of their cousin, UU2. UU2 sourced from a drier, hotter region of Argentina, with the hope that these insects will be more climatically suited to western Queensland, west of the Great Dividing Range. Releases began west of Hughenden in 2015 and will continue over the next few years.

UU has persisted through the heat of summer, cool of winter and lack of food at times, but is yet to make a huge impact on the parkinsonia population. Monitoring of the agent has shown positive results, with larvae found 3 to 5km from an initial release site. With mass rearing and releasing to continue, it is hoped UU will keep multiplying and find a permanent home in Queensland. DAF is hoping UU will determine if this insect becomes an effective biocontrol agent in the long term.
Important points when considering bore construction

Drilling checklist

DRILLING for water involves substantial financial outlay. It is important you make informed decisions when developing a reliable water supply, whether for stock, domestic or irrigation purposes.

GETTING STARTED

Before you contact a driller, consider the following questions:
- How much and what water quality do I need?
- What supply and water quality can be expected?
- What depth will the bore need to go to?
- How much will it cost?
- What type of drilling rig will be needed?
- Where is the best bore site on my property?
- Do I need a permit to drill a bore?
- Do I need a licence to take water?
- How should the bore be designed?

INFORMATION SOURCES

The Department of Natural Resources and Mines (DNRM) may hold information on previous drilling in your area. Contact your local DNRM office to determine if drilling or water bore records are available, or alternatively, you may access Queensland Guides for this information. Drilling contractors can be a good source of information, especially if they have a good working knowledge of a particular district.

You can also seek advice from a private hydrogeological consultant who can provide a groundwater assessment on your behalf. Assessment of potential groundwater supplies will include likely maximum depth, expected water quantity and quality, and preferred drilling sites.

BORE LOCATION

In addition to hydrogeological aspects, the following should be considered when siting a bore:
- Possible sources of pollution (e.g. septic installation).
- Property boundaries and their proximity to where the water will be used.
- Source of power to drive the pump.
- Neighbouring bores, to avoid potential pumping interference.
- Service buildings including power, telephone lines and gas.
- Drilling contractor.

Before engaging a drilling contractor, you should come to an agreement on:
- Whether the drilling rig is capable of doing the job.
- Approximate depth to be drilled.
- The charge for ‘dry’ hole.
- The charge for a completed bore.
- Tests to be carried out on completion (to determine water quality and quantity).

DNRM strongly recommends that a written agreement be entered into between the landowner and drilling contractor prior to commencement of drilling and that this document be signed by both parties.

This written agreement can then be used to sort out any issues that may arise.

A sample agreement is shown on pages 122-134 of ‘Minimum Construction Requirements for Water Bore in Australia’ (web linked at end of article). This document also sets out client responsibilities, drillers responsibilities and shared responsibilities (p10-11).

We would advise you to read this so you are aware of what is required of you and your drilling contractor before entering into any agreement.

FINDING A LICENSED WATER BORE DRILLER

DNRM maintains a Queensland list of registered water bore drillers. This list includes drillers who have elected to have their details made publicly available and is updated annually at a minimum.

BORE CONSTRUCTION

All water bores must be constructed in accordance with the minimum construction requirements for water bores in Australia. Bore in arasetic basins must also comply with the minimum standards for the construction and reconditioning of water bores that intersect the sediments of artesian basins in Queensland (web link provided at end of article). You should be guided by your contractor about the best means of constructing the bore. However, important details should be considered before drilling begins.

- Bore casing should be of suitable material and strength to prevent collapse of the hole.
- Sufficient casing should be inserted so that when the pump is operating, no part of the pump is exposed to open-hole conditions.
- The bore does not pump fine particles or sand; entry via open-hole conditions should be considered only when the stratum is known to be very stable.
- The casing is large enough to accommodate the pump proposed.
- On completion, the driller should provide you with a copy of the drill log form showing the details of depth, material penetrated, construction details and the supply obtained. It is recommended you keep a copy of drilling records so bore details can be retrieved to diagnose any problems that may arise. In all cases the driller must forward a copy of the drill log form to DNRM.

AFTER: DNRM maintains a Queensland list of registered water bore drillers. This list includes those drillers who have elected to have their details made publicly available and is updated annually at a minimum.

LEFT: Assessment of potential groundwater supplies will include likely maximum depth, expected water quantity and quality, and preferred drilling sites.

WATER QUALITY

Before you equip the bore, it is wise to have a complete water analysis carried out. These can be carried out by a private analytate.

Conductivity tests or ‘taste tests’ give an indication only and do not provide sufficient data to determine the overall suitability of the water for your needs. Below are tables setting out water salinity tolerances of different livestock and crops. This is a general guide to one aspect of water quality. It is possible for situations to occur that lead to higher or lower salt-tolerance levels in plants and animals. Note that other elements in water can become toxic as salt levels increase. This also plays a part in limiting water use. It is a good idea to have your water routinely tested.

If you have any queries regarding drilling contact:

Bruce King
DNRM principal technical officer (drilling)
(07) 4648 4775, bruce.king@dnrm.qld.gov.au

For the links below for access to ‘Minimum Construction Requirements for Water Bore in Australia’ and ‘Minimum Construction Standards for the construction and reconditioning of water bores that intersect the sediments of artesian basins in Queensland’:


Managing risks on your property

Property biosecurity plan

HAVING a property biosecurity plan is a useful tool for any primary production enterprise, regardless of how large or small. Effective management of biosecurity risks (i.e. weeds, pests and diseases) on your property will require some preparation, and a property biosecurity plan will help you to identify, manage and prevent these risks.

Property owners and managers also need to seriously consider not only controlling the weeds, pests and diseases present, but preventing the entry of new ones.

Weed hygiene and implementing good biosecurity practices are essential components of biosecurity risk management, and prevention is cheaper than a cure.

Your property biosecurity plan can be as simple or as complex as you want. But developing a plan will help you to achieve your management goals.

Your property boundary effectively becomes your line of defence—you are in control.

Contractors and utility companies will comply with reasonable standards of weed and hygiene, and help you to protect your livelihood—your land.

Use our simple checklist to get started on developing your own property biosecurity plan.

WHAT YOU NEED TO DO

- Create a map of your property. Include infrastructure and land types (paddocks, roads, buildings, dams and yards) and natural resources (unfenced). All these things will impact how you manage biosecurity risk on your property.
- Identify entry pathways. Entry points for pests on to the property such as drives/driveway, watercourses, fodder feed-out locations and yards. Animals and items contaminated from other properties are common entry pathways for pests, pests and disease.
- Identify pests and diseases present. What have you got and where is it? Don’t know what it is? Talk to your local pest-management officer for help with weed identification, and contact your private veterinary practitioner for animal disease identification and management.
- Assign priorities for control. You can’t do it all. Prioritise and set realistic management goals for each weed species. Remember to work from the smallest to the largest part of an infestation or, for animal diseases, ensure control measures are comprehensive.
- Create a work plan. Make a realistic work plan that allows you to achieve your goals. What time of year will you carry out control? How will you control it? What scale of methods do you need to combine? Who will control it? Do you need to organise staff rosters accordingly?
- Identify annual budget.
- Identify potential pests. Know what you don’t have. What biosecurity risks are in the region that you don’t yet have? Know what they look like. Talk to your staff know what they look like—and keep a look-out.
- Make a weed and disease hygiene policy. Ensure visitors arrive at a central point. Have central clean-up options. Use turn vehicles to drive around the property where possible—try not to bring on vehicles and equipment used on other properties. Keep records of the movements and origins of important weeds, pests and animal disease vectors such as fodder, machinery, personnel and animals.
- Monitor and review. Not getting the results you wanted? Keep notes on the results of prevention and control activities, arising issues and seek advice when required. Review and update your plan where necessary.

Set realistic goals, start small, and catch weeds, pests and diseases early.

For information or advice, contact your local council pest-management officer, private veterinary practitioner or Biosecurity Queensland on 13 25 23.


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Property owners and managers also need to seriously consider not only controlling the weeds, pests and diseases present, but preventing the entry of new ones.

Weed hygiene and implementing good biosecurity practices are essential components of biosecurity risk management, and prevention is cheaper than a cure.

Your property biosecurity plan can be as simple or as complex as you want. But developing a plan will help you to achieve your management goals.

Your property boundary effectively becomes your line of defence—you are in control.

Contractors and utility companies will comply with reasonable standards of weed and hygiene, and help you to protect your livelihood—your land.

Use our simple checklist to get started on developing your own property biosecurity plan.

WHAT YOU NEED TO DO

- Create a map of your property. Include infrastructure and land types (paddocks, roads, buildings, dams and yards) and natural resources (unfenced). All these things will impact how you manage biosecurity risk on your property.
- Identify entry pathways. Entry points for pests on to the property such as drives/driveway, watercourses, fodder feed-out locations and yards. Animals and items contaminated from other properties are common entry pathways for pests, pests and disease.
- Identify pests and diseases present. What have you got and where is it? Don’t know what it is? Talk to your local pest-management officer for help with weed identification, and contact your private veterinary practitioner for animal disease identification and management.
- Assign priorities for control. You can’t do it all. Prioritise and set realistic management goals for each weed species. Remember to work from the smallest to the largest part of an infestation or, for animal diseases, ensure control measures are comprehensive.
- Create a work plan. Make a realistic work plan that allows you to achieve your goals. What time of year will you carry out control? How will you control it? What scale of methods do you need to combine? Who will control it? Do you need to organise staff rosters accordingly?
- Identify annual budget.
- Identify potential pests. Know what you don’t have. What biosecurity risks are in the region that you don’t yet have? Know what they look like. Talk to your staff know what they look like—and keep a look-out.
- Make a weed and disease hygiene policy. Ensure visitors arrive at a central point. Have central clean-up options. Use turn vehicles to drive around the property where possible—try not to bring on vehicles and equipment used on other properties. Keep records of the movements and origins of important weeds, pests and animal disease vectors such as fodder, machinery, personnel and animals.
- Monitor and review. Not getting the results you wanted? Keep notes on the results of prevention and control activities, arising issues and seek advice when required. Review and update your plan where necessary.

Set realistic goals, start small, and catch weeds, pests and diseases early.

For information or advice, contact your local council pest-management officer, private veterinary practitioner or Biosecurity Queensland on 13 25 23.
Rehabilitation costs put into context

A demonstration project funded under the Reef Rescue research program has evaluated three mechanical disturbance treatments to quantify their effectiveness in rehabilitating degraded lands.

### Monitoring responses to pasture treatments

![Figure 1: Pasture and legume responses to different treatments.](image)

### Pasture yield estimation an essential skill for graziers

#### Photo standards

FORAGE budgeting is an empowering tool for graziers to help determine appropriate stocking rates. Estimating pasture yield is one of the essential components in undertaking a forage budget. Under or overestimating pasture yield will result in over-grazing and degradation, or under-grazing and forage beef production, and therefore income.

There is a wide range of pasture yield photo standards available on the FutureBeef website for most pasture communities in Queensland. However, when out in the paddock, it is often difficult to decide which photo standards to use, as land types can vary over short distances and land types often blend into each other.

Producing your own set of pasture yield photo standards will make it easier to decide which photos to use. In addition, because you have been out in the pasture, you will have a good mental picture of the pasture that will reinforce what is in your photographs. One day in the field and one day in the house/office should be sufficient time to develop a set of pasture yield photo standards for most properties.

If you have school-aged kids, involve them in this exercise, as it may be the start of a life-long habit of pasture budgeting and monitoring. They may also be able to make it into a school project.

**The BASIC STEPS**

1. **List the major land types on the property, as a set of photo yield standards will be required for each land type.** If it is an issue, select the major land type in the broader paddock, as land condition tends to be poorer in these paddocks. Determine which stocking rates based on a forage budget will improve land condition in this scenario.

2. **Select the sites that are representative of the majority land condition for that land type.** For example, if the box country is mostly in condition B, select condition B sites for that land type.

3. **Mark an area 6m × 6m (6m can do it if you have your compass handy).** Take a photograph of the site (eye height in standing position) with all four markers of the 6m × 6m square in the photo, position the two back markers near the corner of the photo with only a small margin around the outside. Use a focal length of about 24-50mm – not wide angle or zoomed in.

4. **Do not take the photo from the tray of a 4WD as you will be too high.** Repeat this exercise across a range of pasture yields from high to low (four to six photos) for that land type.

5. **With the box country in condition B, repeat the exercise across a range of rainfall from high to low.** Repeat for each major land type on the property. By using your own pasture yield photo standards, more realistic data can be entered into the Stocktake Plus app, which will calculate a forage budget and appropriate stocking rates for your paddocks.

#### Table 1: Calculated potential carrying capacities in adult equivalents per 100ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Radiation (J/m²)</th>
<th>Potential Carrying Capacity (AE/100ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep ripping</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>Chisel ploughing</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>

### Table 2: Results of the partial discounted cash-flow analysis.

**Note:** The treatment of the pasture is Deep ripping. The cost of deep ripping is $210.85/ha. The potential carrying capacity is 20 AE/100ha. The discount rate is 5%.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>NVP (5% at 10%)</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep ripping</td>
<td>111.84</td>
<td>4.36</td>
</tr>
<tr>
<td>Chisel ploughing</td>
<td>87.47</td>
<td>5.55</td>
</tr>
<tr>
<td>Crocodile seeding</td>
<td>-5.48</td>
<td>-4.37</td>
</tr>
</tbody>
</table>

**Figure 1:** Pasture and legume responses to different treatments.