Research to Reality

Practical solutions to beef enterprise issues in the Burdekin Catchment

Project case studies 2008

Accelerating improvement and impact on profit and sustainability of beef businesses in the Burdekin Catchment within 2 years.

CRC Beef

BURDEKIN DRY TROPICS NRM
Sustaining our resources

Queensland Government
Department of Primary Industries and Fisheries

Overview

Approximately 90% of the Burdekin Catchment area is utilised for extensive cattle grazing. There are about 500 commercial grazing enterprises that range in size between 10,000 and 50,000 hectares and run 2000 to 5000 head of cattle. More than 70% of the grazing properties are family operated. Managing for climate and market variability whilst optimising beef production and land condition is a challenge all graziers have to face.

The Research to Reality Project (R2R) was developed to assist producers to develop practical responses to a range of production and natural resource dilemmas. Their responses have been summarised into two main topics

1. **Management of grazing land** (including planned implementation of grazing systems, flood recovery, parthenium control, managing for diet quality)
2. **Management of breeder nutrition** (appropriate business decisions for breeder nutrition)

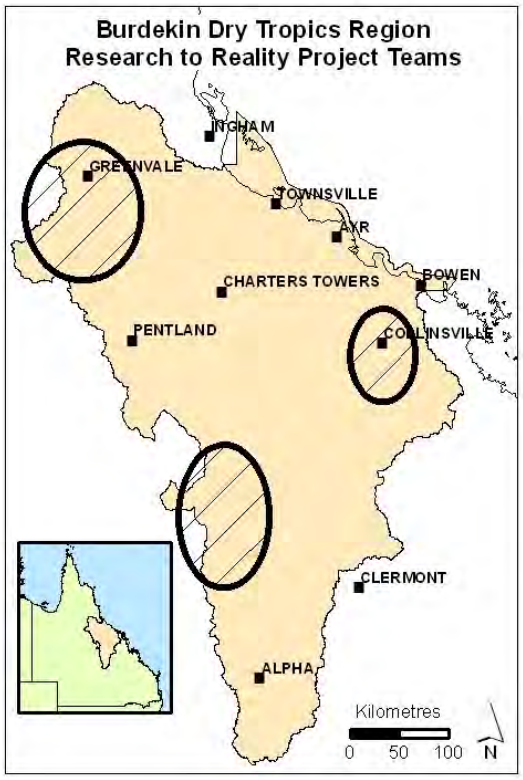


Figure 1. Burdekin dry tropics region – Research to Reality project teams

Located in the Burdekin catchment of North Queensland, the project involved three beef producer teams encompassing 19 businesses, 680,000 ha of land and the management of 162,000 cattle. The project foundations lie in continuous improvement and innovation (see Figure 2), with the project teams using a range of methods to identify, develop and implement on-property research projects.

Figure 2. Continuous Improvement and Innovation

Property planning (integration of wet season spelling)

Key question

How can property planning assist in increasing the sustainability and productivity of my beef enterprise?

The problem

Like most producers, those involved in the Research to Reality (R2R) project are continuously looking for areas where improvements can be made to increase carrying capacity and enterprise productivity in a sustainable manner. Where to invest time and dollars to get maximum return can often be a complex question. Which land types will benefit most from further development? Where should new waters and fences be located? How can different grazing strategies help to maximise production?

The solution

Producers involved in the R2R project worked through a series of steps to overcome key issues relevant to their enterprise. This section represents an overview of the principles used with examples of how they have been applied.

The process

1. Turnoff strategy

Starting with the end in mind is the key to any good planning process. For a beef enterprise this means considering the different classes of cattle you will market.

The lack of a turnoff strategy means target markets are unclear or undecided with reactive rather than planned selling strategies. In most cases it leads to reactive stocking rate decisions and restricting options for spelling paddocks or for rotating cattle.

> Like many producers in the North we have traditionally turned off 300 kg plus (DW) bullocks at four years of age. Analysis using DPI&F's Breedcow Dynama shows that given our high 85% weaning rate, a more profitable turnoff strategy for our enterprise may be a 350kg (LW) steer at two years. The Shorthorn X herd provides opportunities for a premium price as a 'feed on' article or held onto to finish as an MSA article. To achieve this strategy we need to ensure weaners average 150kg and achieve a minimum of 140kg weight gain during the wet and 60kg during the dry. The feeding of M8U is seen as a viable option to assist in achieving the target 350kg live weight at two years.

Developing a turnoff strategy involves identifying the markets to be targeted so that it is clear which type of animal product is required to meet demand. This includes consideration of age, sex, weight, and breed.

2. Mob management

Having a clear turnoff strategy allows you to determine the herd structure, sizes and number of mobs required. Some considerations in organising cattle mobs include:

- Labour efficiency - reducing unnecessary mustering
- Nutritional needs – similar grazing, production feeding

> Our business aims to produce a 2 tooth trade ox dressing 300–340kg. We identified the following 9 mobs:
>
Bullocks	Cull heifers
Yearling steers	2nd calf heifers
Weaner steers	Cull cows
Weaner heifers	Breeders
Joined heifers	

or supplementation needs
- Disease status – managing the risks of spreading known diseases
- Husbandry/management needs – similar weaning, weighing, vaccination, tick control or bull removal requirements

Having the mobs located on 30% of the property at any point in time can also assist in reducing mustering and maintenance (fencing and waters) costs.

Once the number of mobs is decided, consideration can be given to the number of paddocks required and water resources.

3. Determining carrying capacity

Carrying capacity is the average number of animals a paddock can be expected to support over an identified period. Many producers approach this by visually assessing paddock condition and matching this with production needs. Determining long term carrying capacity can be based on historical knowledge, or a more formal approach can be taken that integrates land type information and pasture growth tables. The Edge Grazing Land Management or RCS Grazing for Profit course can assist you with this calculation.

> Our aim is to increase production through more intensive property management. We have calculated the stock days per ha to help in monitoring the number of stock days taken out of the grazing system each year. Stock days/ha are calculated by dividing the paddock areas by the number of LSU's i.e. 16,000 ha / 4000 LSU = 4 ha/LSU.
> 365 days /4 = 91 stock days/ha. This figure can then be used to calculate the stock days/ha/100mm rainfall i.e. 600mm rainfall = SDH/(600/100) 91/6 = 15SDH/100mm. (1 LSU = 400kg steer with no liveweight gain LWG)

4. Grazing strategy

A grazing strategy should outline how you plan to use your paddocks to get the optimal benefit for your cattle and land. Your strategy should meet a number of criteria. It should enable you to spell pasture plants, promote even pasture utilisation and effectively match stocking rate to carrying capacity.

Many of the producers in the R2R projects use a mix of rotational rest and rotational grazing systems. Some producers use a conservative continuous grazing with opportunistic wet season rest. Figure 3 is a breeder system to consider.

> Our grazing strategy is focused on extending the quality of feed to maximise weight gain. We do this through a mix of time controlled and rotational grazing systems. This system is used in conjunction with production feeding of a molasses brew to achieve a live weight gain of 2.5kg/head/day over summer.
> We are utilising NIRS testing to help understand the grazing ecology of a time controlled grazing system and provide data to assist in making decisions about timing of supplementation.

There are some key grazing principles that are worth considering in conjunction with the implementation of an appropriate grazing system.

- **Allowing pastures to rest:** Plants require time to regrow and replenish. Plant growth rate dictates the rest period required. During the wet season when growth rates are faster paddock rest can be shorter, however paddocks need to rest for longer periods during the dry when plant growth slows.
- **Matching stocking rate to carrying capacity:** Stocking rates should reflect carrying capacity changes. The end of the wet season is the best time to be making decisions about the required stocking rates for each paddock. Stocking rates should be reviewed during the dry season to ensure adequate groundcover and yield is present at first rain.
- **Have adequate numbers of paddocks for each mob of cattle:** The right number of paddocks per mob enables greater control over the amount of time cattle spend in each paddock which maximises land condition and animal nutrition.

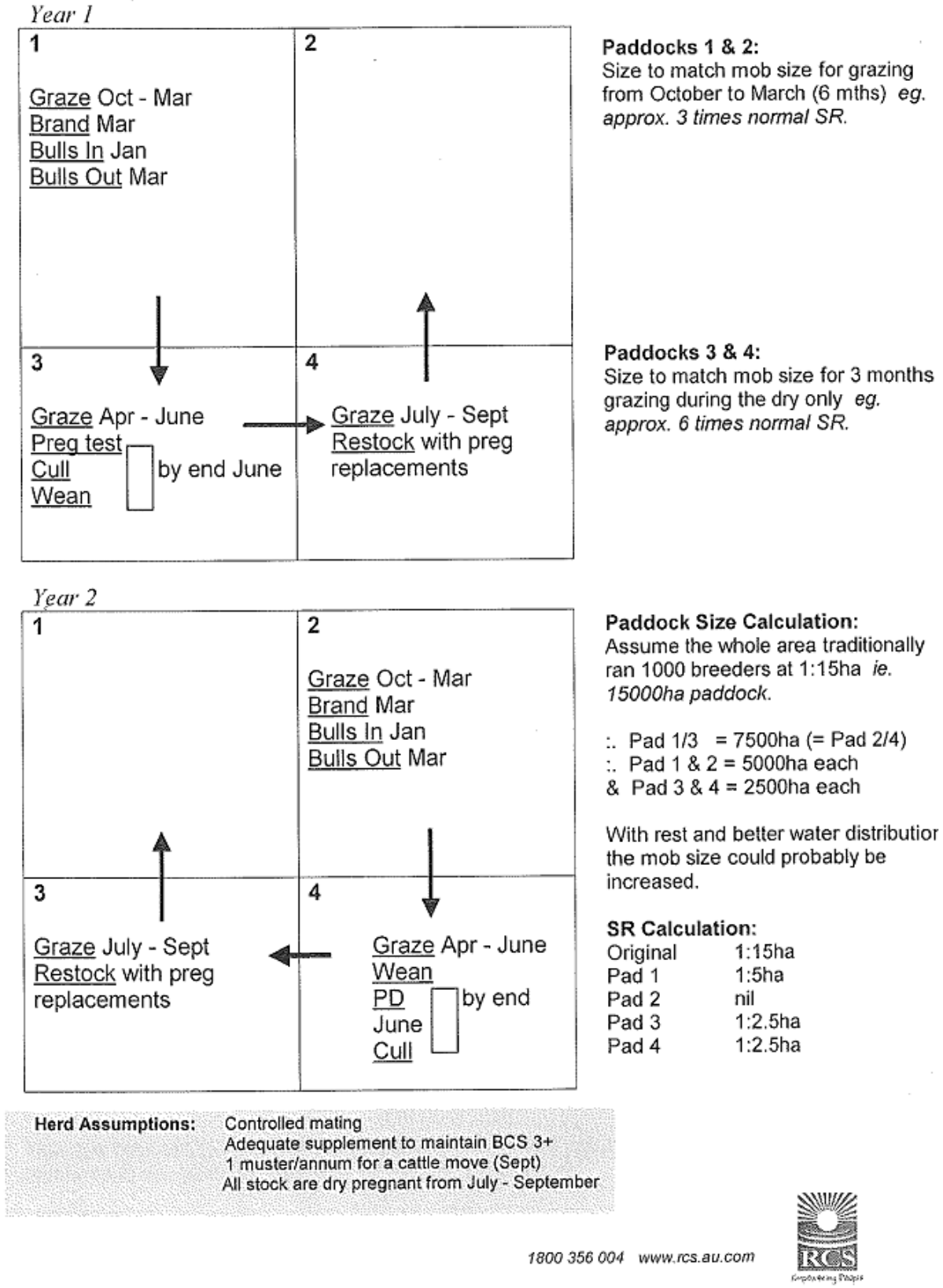


Figure 3. A simple 4 paddock rotation system designed by RCS. This can be used for rotating a breeder mob. This system integrates paddock moves with breeder and weaner management. Each paddock is rested during the wet at least every second year.

5. Planning water resources

Planning water resources is one of the most important ways producers can influence pasture utilisation. There are three important elements to water planning – the location of waters, water supply and water flow rate requirements.

We have designed a three-year plan for water development. This plan includes a financial outlay in water and fencing related costs of $15,000 in year 1, $103,000 in year 2 and $86,000 in year 3. These improvements are projected to increase the carrying capacity by 1100 AEs providing scope for an additional $165,000 in enterprise turnover. 1 AE = 450kg steer

As a general rule, evenness of pasture utilisation reduces significantly 1.5km from water. This means that the maximum distance between waters should be 3km. Most producers will have visually identified areas in paddocks that are undergrazed or overgrazed because of distance to water.

Water flow requirements need to be based on an accurate projection of future carrying capacity. This may mean calculating current flow rate requirements and then doubling or tripling the rate to cater for future increases in carrying capacity.

The location of water points also needs to allow for future fencing requirements. For example, locating water points on the edge of land types gives you the option to construct fences with fewer land types in the paddock.

6. Calculating costs

At this point most enterprises will have a wish list of desired improvements. While this can appear daunting it is important to note that most enterprises will have the paddocks and waters to commence an improved grazing strategy without the need for substantial capital or fencing.

The following steps were used by R2R producers in planning the desired improvements:

- Prioritise those improvements that are first stage (the must dos), second stage and third stage developments
- Calculate the capital required for each stage
- Calculate the return on investment
- Review and plan the specific activities

The table below provides a breakdown of the development costs of three R2R enterprises that undertook the property planning process. These details provide a snapshot of the scope for gains to carrying capacity achieved through property development. The rate at which these gains can be made are dependent on cash flow; seasonal conditions and management choices that impact on the speed of land condition recovery.

Table 1. Enterprise development costings

	Property 1	Property 2	Property 3
Current herd size (LSU)	1,700	12,000	4,000
Cost of development ($)	415, 451	414, 018	561, 098
Cost per ha ($/ha)	10	18	26
Carrying capacity increase (LSU)	2, 283	1, 136	2, 026

7. Fine tuning production

The final stage in the planning process focuses on looking for new opportunities to fine-tune production practices created by property development (Table 2).

Table 2. Production practices

Practice	Focus
Nutrition	
Targeted supplementation	Cost effectively meeting the different nutritional needs of various classes of animals.
Production feeding weaners	Cost effectively maximising weight for age.
Spike feeding first mated heifers	Improving nutrition to encourage cycling and conception.
Breeding	
Controlled mating	Accurately calculating the optimum time of calving and organising the breeding system to achieve a 12-month calving interval.
Weaning strategy	Achieving a target weaning weight and a cow body condition score 3+ at calving.
Grazing	
Wet season spelling	Organising mobs and paddocks to enable pasture to be spelled after the first significant rain fall event (>50 mm over 3 days) until the middle or end of the rainy season.
Rotational grazing	Implementing a grazing strategy that maximises animal nutrition and maintains or improves land condition.

The outcome

The property planning work undertaken by R2R producers culminated in the design of a detailed development plan. Specifically producers involved were able to take steps towards achieving:

- Integration of wet season spelling with animal production and business and family direction.
- Projected improvement in land condition within 5 years with associated carrying capacity improvement.
- Projected improvement in business profitability via strategic targeting of markets and monitoring of business performance.
- Personal confidence in business direction, decision-making, and accessing of information to solve problems.
- Targeted supplementation to improve animal performance and meet target market specifications.

For many R2R producers, this process also reinforced the importance of regularly reviewing different approaches. In particular, incorporating seasonal monitoring activities such as grass budgeting (including photo points) and adjusting stocking rate as required. Accurate records on levels of supplementation and production feeding were also seen as important particularly given the significant rises in input costs. Technology such as NLIS and Global Positioning Systems (GPSs) were seen as essential tools in helping to collate accurate data to support various management decisions.

Parthenium control

Key question

How to control parthenium on basalt soils?

The problem

Bare soil is vulnerable to the invasion of weeds such as parthenium. Once established, parthenium is difficult to manage due to its rapid seed production and ability to spread via vehicles, humans and animals.

Disturbed areas or those under high pressure from cattle, such as watering points, are usually first to succumb to parthenium invasion. Regular visits to these areas by managers increase the likelihood of humans spreading the weed to other areas of the property.

Parthenium weed doesn't just degrade pastures and the environment but can also cause health problems for some people. Allergic reactions include:

- **severe contact dermatitis**
- **hay fever**
- **aggravated asthma**

The solution(s)

Prevention is the best solution in weed management. Once established for several seasons, weeds such as parthenium become self generating and can be difficult and costly to control. By maintaining good vehicle and machinery hygiene and managing stock movements, the risk of weed entry reduces. Early detection is essential to stopping spread of weeds on the property. If parthenium becomes established, the following steps are recommended to minimise the impact on production and the environment.

1. **On-property hygiene**. Considerable effort should be placed in good vehicle hygiene and strategies such as visiting weed-free watering points first. Reduce vehicle contamination by clearing roadways of parthenium using a suitable herbicide and avoid driving on parthenium plants. Local trials have proven the effectiveness of using a Boomjet boomless nozzle spray to control patches of pathenium around cattle camps and dams.

   Herbicide is most effective when treating small or isolated infestations. Using a selective broad-leaf herbicide such as metsulfuron methyl will minimise damage to grasses while providing control of parthenium in pasture. Follow-up control is always essential as plants will be missed by the sprayer and new plants may have also established.

2. **Maintain a competitive pasture**. Grazing management practices that encourage strong, competitive 3P (Perenial, Palatable and Productive) pastures is the key to beating parthenium. Re-establish pasture in extensive bare areas by sowing seed in conjunction with herbicides, wet season spelling and conservative grazing.

   Ensure all paddocks have a full wet season spell at least every three years and pay special attention to management afterwards, so that the benefits are maintained by light to moderate stocking. Shut off waters in the wet season – particularly on black soils. Relocate troughs from black soil areas and reticulate water onto adjacent red soil ridges with poly pipe.

   Forage budgeting is the best option to better match stock numbers to available feed and ensure that sufficient pasture remains in terms of quantity and cover. Start feed budgeting

at the end of the growing season to determine cattle numbers to next summer. Estimate current long-term carrying capacity and compare with cattle records over recent years. If necessary reduce herd size by re-evaluating carrying capacity.

3. **Manage land types.** Fence to land types so grazing can be managed. Cattle will favour and overgraze black soil areas allowing parthenium to encroach. Evaluate the option of using temporary electric fencing to spell black soil.
4. **Biological control.** There are not many control agents in north Queensland that have an effect on parthenium. The release of the Carmenta moth, a proven effective agent in Central Queensland would be valuable. Mid-Spring, or early summer is the suitable time to release biocontrol agents in north Queensland. A workshop for local community groups on biocontrol rearing and release methods is a good starting point for this program. The ideal way is to establish permanent parthenium nurseries on selected properties, (allow a patch of parthenium to remain green throughout the year to sustain the biocontrol agents). Proximity to water will allow regular watering of the parthenium plants (preferably contained either by an insect proof cage or a fence). Then regularly release biocontrol agents reared from the lab or collected from the field on to the parthenium nurseries. For further information on establishing biological agents contact a DPIF Land Protection Officer.
5. **The role of fire.** From the perspective of controlling parthenium, research in central Queensland shows that fire does not significantly reduce parthenium soil seed bank. But it does promote the germination of pasture grasses and controls woody weeds. If needed, fire can successfully be incorporated into a parthenium control program but it is critical that attention is paid to grazing management post fire.

DPI&F has fact sheets and manuals on parthenium weed management.
For copies contact your local government weeds officer, your DPI&F land protection officer or visit the DPI&F website www.dpi.qld.gov.au

The outcome

An integrated management program including vehicle hygiene, healthy pastures, strategic herbicide use and introduction of a suitable biological control agent will minimise the impacts parthenium has on production and the environment. If parthenium has been established for several seasons there needs to be a long-term sustained effort to keep the weed under control.

Wet season spelling management strategies to assist in parthenium control

- Paddocks benefit from periodic rest from the first rains until the middle to end of the wet season. Spelling involves the complete destocking of the paddock.
- Poor condition land requires an increased frequency and duration of rest to assist in recovery of 3P grasses and soil health.
- All paddocks need occasional wet season rest; target those most in need first.
- In good seasons, rest as much as possible. In dry years rest is difficult, but just as important (if not more so) than in other years.
- Sufficient paddocks should be established to allow regular wet season resting of all paddocks.

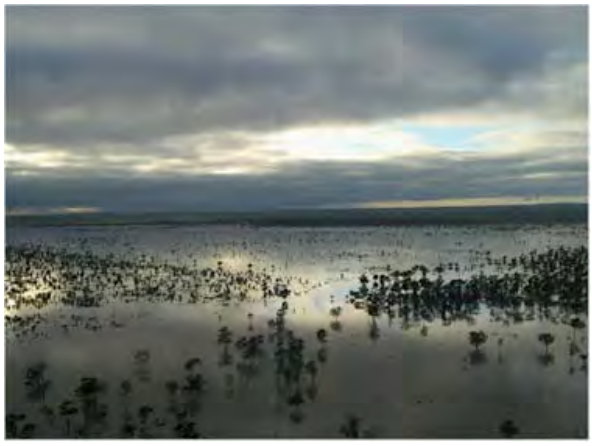
Flood recovery

Key question

How can I manage flood affected land to promote a quick return to full production?

The problem

In January 2008, record flooding along the Belyando River resulted in approximately 380,000 hectares of prime grazing land being inundated by floodwaters for up to 3 weeks. On the worst affected properties between 50-95% of land area was flooded.



Flood area in the Belyando region

Dead Buffel grass, and bare ground being invaded by parthenium with forage sorghum plants in the background

In this area pastures are generally dominated by buffel grass (*Cenchrus ciliaris*) which does not tolerate prolonged flooding or waterlogging. Consequently, in the most severely affected areas, broad scale death of buffel as well as native pasture species occurred. There is also evidence that much of the buffel seed died leaving depleted soil seed banks. Weeds, particularly parthenium, have proliferated in the absence of perennial grass competition and in areas of low ground cover. From a production perspective, ProfitProbe ™ shows 'meat gross margins' (gross product less livestock direct costs per hectare) of $45/ha could usually be expected in this area. In its current condition, beef production from affected land has reduced significantly with full production not expected for 2-5 years. As the alluvial frontage country is historically the most productive land on the affected properties, the impact on gross margin across the whole enterprise is multiplied.

The solutions

Recommendations for managing flood affected pastures include destocking or excluding stock where possible (spelling), monitoring and controlling the outbreak of weeds, and reseeding.

1. **Spelling**
   Pastures establishing from seed are very susceptible to grazing in the early stages when grass is developing its root and shoot system. Once the grass has set seed, a light graze before winter may be available. With such large areas affected it may not be possible to spell all paddocks effectively so some may have to be sacrificed initially and then given special attention later. Options such as agistment, temporary electric fencing to exclude stock, or shutting off waters to encourage grazing in better areas of the paddock need consideration. The key to recovering land condition is a grazing system that promotes palatable, productive, perennial grasses.

2. **Pasture seeding**
   After the January flood event, project participants aerial seeded with a mix of buffel and forage sorghum. Flood tolerant grasses Bambatsi and Floren Bluegrass were also seeded via seedbed on a limited scale. The forage sorghum was included for two purposes: to

quickly establish ground cover in case of further flood events or onset of drought, and to provide forage to cover the feed gap while native and improved pastures re-established. In the following months weights gains of 1.4 kg per day were recorded in steers grazing forage sorghum highlighting its ability to give a high level of production in the first year.

Another option graziers are considering is using taller buffel varieties such as Biolela and Nunbank. They are more likely to survive a flood event if not fully submerged, however these varieties are not as palatable as the shorter varieties such as Gayndah and USA/American.

On reflecting on the effectiveness of aerial seeding after the flood, one grazier suggested that he would now do it differently. A common problem across all properties was that because the flood had damaged property infrastructure, including roads, stock could not be shifted from flooded paddocks. The inability to spell country meant that some of the benefits of seeding were lost. A better option may have been to wait until the cattle could be moved and then spend the money on seeding at the start of the next wet season.

The flood tolerant grasses Bambatsi (*Panicum coloratum*) and Floren Bluegrass (*Dicanthium aristatum*) are suitable for cracking-clay soils but they are both much more difficult to establish than buffel and need a well-prepared seedbed. Establishing these species in areas where flooding is irregular may not be viable due to buffel outcompeting them between floods. But in areas that are regularly flooded buffel will not persist and these species are a good option. Legumes such as lablab, butterfly pea and Desmanthus may be worth considering in a seed mix to increase animal production and boost soil nitrogen levels. There is the chance that buffel will compete aggressively but good grazing management will promote species diversity.

Another suggestion was that because of the relatively high productivity of sorghum versus grasses (when grown from seed), it would have been better to bias the seed mix more heavily toward sorghum to increase beef production in the initial period of the feed gap.

3. **Weed control**
   If stock can not be excluded from the flooded areas, pasture recovery will be slower. With a lack of pasture competition, parthenium has flourished in the flooded areas along the Belyando River. Due to the extensive areas involved, herbicide control of parthenium is not usually practical. Chemical intervention may be warranted for isolated outbreaks of other weeds. In the Emerald area where dead buffel grass was sufficiently dense it contributed significantly to ground cover, which may have assisted in excluding undesirable grasses and weeds at some sites.

The outcome

Recovery of buffel grass after the flooding varied from site to site. Healthy buffel plants on adjoining non-inundated land will provide a seedbank for the areas of buffel death as the seed is progressively introduced through wind and animal transport. Although this did not happen rapidly enough for any significant buffel establishment during the summer months following the flood, buffel should establish in these areas next summer. Where the nearest seed source is some distance away, reseeding may be viable (aerial seeding @ $2-$2.50/ha + seed cost).

While the buffel death provided an opportunity for desirable and native grasses to colonize or compete with buffel it also provided opportunity for weed species to invade. Parthenium has increased rapidly across areas where buffel has died. This increase has been aided by stock actively grazing the new buffel growth.

This highlights the importance of planned exclusion of grazing following flood events.

Grazing management using NIRS technology

Key question

Will improving my grazing management system prolong pasture digestibility into the dry season?

The problem

The northern Australian wet/dry seasons mean the 'window' for growing cattle on pasture alone is usually limited to the wet season (up to 5 months).

Good quality grass grows rapidly in the first few months of the wet season, but then becomes stemmier as plant lignum increases, making it tougher to digest. With reduced plant digestibility, the ability of the grazing animal to absorb plant nutrients is also reduced, resulting in weight loss unless supplemented. The increasing costs of the ingredients to supplement cattle means any potential saving via grazing management is worth investigation.

The solution(s)

Graziers managed their own study with assistance of relevant specialists.

Two properties of similar land types tested three different grazing strategies

1. Rotational Resting – Wet season rest every X number of years – rest period may vary
2. Time controlled (Cell) – Paddock moves are based on growth rate of pastures
3. Continuous – Plants continuously exposed to stock

Diet quality was measured monthly from January to July 2008 using Near Infrared Reflectance Spectroscopy (NIRS) technology (dung sampling). Additional information on pasture and animal condition, as well as rainfall was also recorded. Graziers then interpreted the results.

The outcome

Although not a replicated trial, this investigation provided very interesting information for the researching graziers.

The strength of this study was not just trying to find which system was better, but having actual pasture diet quality figures to analyse and discuss with other graziers and specialists.

Apart from the expected diet quality response to rainfall (Jan-Feb) and a subsequent decline thereafter, there were a couple of discussion points:

1. Plant digestibility did decline slower in the rotation paddocks than the continuous and time controlled systems. However, this may not have been entirely due to the management system alone, as the paddocks in the rotation (figure 5) had more legumes (stylos) available and were preferentially grazed; potentially prolonging diet quality.
2. The cell strategy appeared to maintain slightly better digestibility levels than the continuous strategy until July, when all treatments had fallen to a similar level.

Both graziers wish to continue NIRS testing to be confident of any conclusions.

Additional analysis of faecal phosphorus recorded throughout the same period at one of the properties showed much higher P levels than expected. This prompted the question of whether current supplementation levels of this expensive supplement were appropriate. The graziers

will use the nutrition data (both phosphorus and NIRS results) to discuss their plans further with nutritionists.

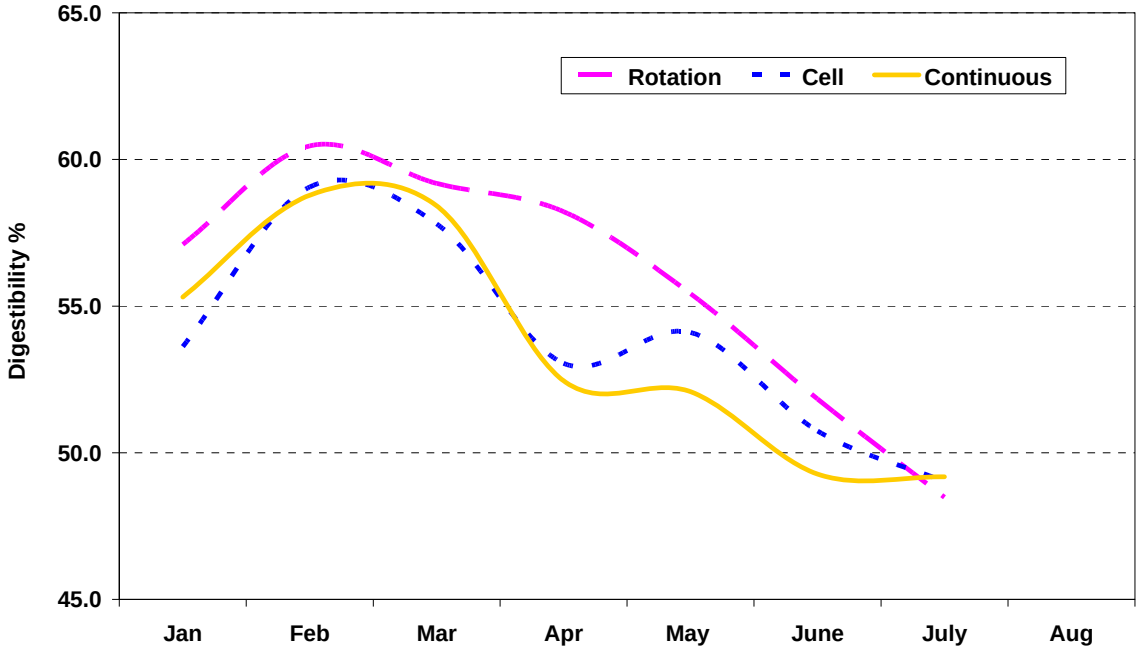


Figure 4. NIRS study 2008 — Digestibility of the diet expressed as a percentage

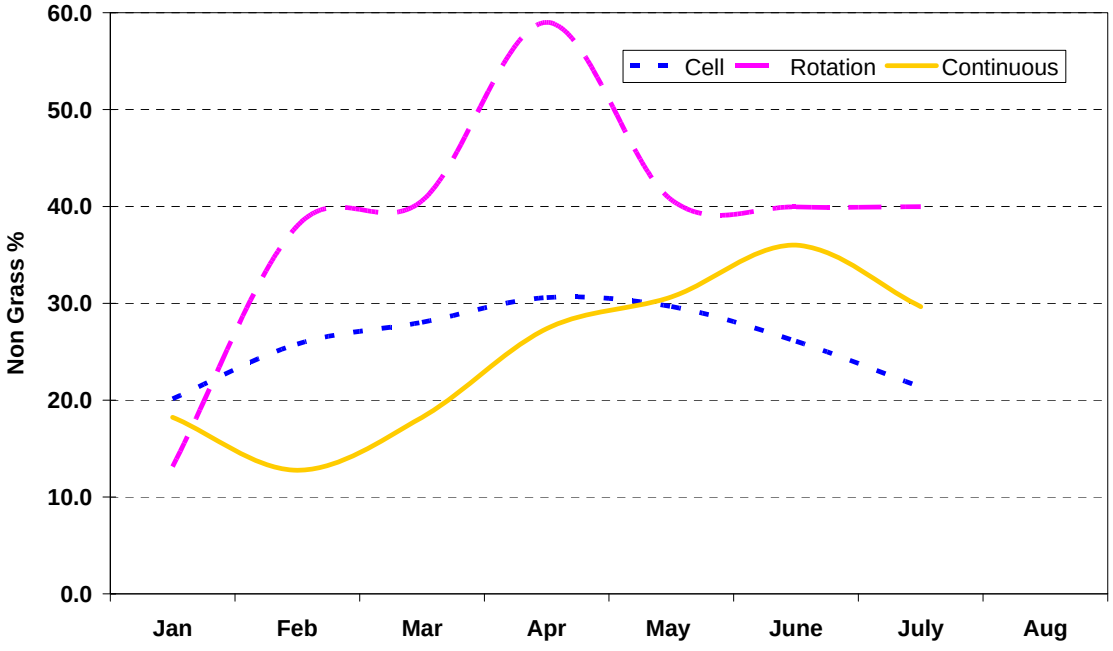


Figure 5. NIRS study 2008 — Composition of non grass in the diet expressed as a percentage

Management of breeder nutrition

Key question

How do I improve breeder performance (calf output and weaner weights) with nutritional management?

The problem

Many properties running *Bos indicus* cross cattle in northern Australia have a variable pattern of branding rates, with under-nutrition the principal cause of low productivity in breeder herds. Challenges include:

- Sourcing cheap protein and managing intake during the dry winter months
- Phosphorus deficiency in young female beef cattle leading to poor body condition, and very low reproductive fertility (conception and weaning rates)
- Substantial increases in the cost of supplements (licks), particularly urea and phosphorus.
- Poor detailed feeding and cattle production records, making it difficult to analyse past feeding strategies

The solution(s)

With the escalating cost of supplementary feeding, all producers need to assess the costs of alternatives that may ultimately be cost beneficial in reducing the annual costs of supplementary feeding. Management strategies include:

Cattle management

1. Wean calves based on cow condition to improve breeder liveweight at joining[1]. Additional benefits will be gained by feeding urea-based supplement to conserve breeder body condition through the dry season. Research suggests a 10-15kg increase in cow liveweight over the dry season should result in >5% increase in branding rate.
2. Provide strategic and targeted P supplementation, including growing heifers and joiner heifers during growth, gestation and lactation (first calvers) to build skeletal storage of P which can be drawn on during peak demands such as rapid growth, late gestation and lactation.
    a. breeder segregation (pregnancy testing at $1.80-$2/head plus travel) will eliminate the need to supplement some cattle.
    b. weigh and segregate young cattle frequently to measure whether they are reaching target weights.
    c. Re-consider the age / weight at turn-off to reduce inputs required.
    d. Ensure all other variables are under control so cattle can maximise the benefits of lick, e.g. disease control (vaccines and worming); cattle selection, particularly joiner heifers.

[1] Mustering costs must be considered if weaning more frequently (e.g. chopper costs are $330-$360/hour plus fuel at $100/hour and leading hand contract labour at $200-240/day)

3. Calculate on a regular basis:
    a. supplement intakes
    b. the cheapest effective source of these nutrients
    c. nutrient requirements for different classes of cattle[2]

Land management

- Adding stylos to pastures could improve pasture crude protein content by 10-20% which would delay, reduce or eliminate the urea requirements of certain classes of cattle at certain times of the year.
- Seeding with native and exotic grasses in certain areas would improve the dry matter digestibility (DMD) and therefore, energy content, of the pasture.
- Better water point distribution will assist with pasture utilization which may decrease lick intakes because cattle will be eating lick as a supplement not a substitute.
- Matching stocking rate to carrying capacity by routine pasture dry matter assessments (pasture budgeting) at the end of every wet season reduces the risk of running low on feed……something that feeding lick cannot correct!
- It could be cost beneficial to purchase or agist a fattening block so weaners are trucked straight off the cow to better nutrition with significantly reduced supplementary feeding requirements.
- Maintain or improve land condition to ensure a better quality diet and consistent forage supply.

Monitoring

The critical pieces of information that need to be recorded for managers/advisors to make sound decisions/recommendations on breeder performance are

- **Consumption data** – date, amount of supplement, and numbers of cattle in each paddock or lick delivery point.
- **Performance data** – pregnancy (foetal ageing for conception patterns), branding, weaning data for each paddock being fed; weaning weights and weight gain while cattle are on lick. Weaning weight may also reflect conception patterns.
- **Cost** – prices paid for the various licks being fed
- **Ingredient analysis** – what is in the various licks being fed
- Any changes to **management strategies** in each paddock; group of cattle that may affect their performance response to lick.
- **NIRS results** – over the course of the year and results recorded with the lick consumption and analysis data.

Date	Paddock or feed station	Animals		Supp. Fed (kg)	Product name or mix	Intake (kg)	Comments (include NIRS results)
		No	Class				
12/5/08	*Windy*	100	Cows	200	30% urea custom mix*	Start	30 April NIRS 5% CP & 50% Digest.
17/5/08	*Windy*	100	Cows	100	As above	100 kg	Intake per head = 0.2 kg per day

* Keep details of ingredients and proportions in custom mixes.

Figure 6. Example of a simple layout for monitoring dry lick intakes

[2] Depending on the country and season, mature breeding cows in late pregnancy / early lactation require 40–60g urea and 5–10g P/head/day during the dry season. Early weaned calves either need to be immediately transferred to better country or supplemented with energy (12MJ/kg), protein (>16%), mineral and vitamins in a balanced format.

The outcome

In order to assess the requirements for supplements, three steps are vital:

1. **Good records.** Supplement delivery - what, when and to whom; production response to supplement.
2. **Analysis to determine when to start and stop feeding**. Take faecal NIRS samples from mid-wet to mid-dry season. Sampling in the other months would be beneficial when starting out. Costing about $800 annually (0.4% of the annual lick cost), this has the potential to substantially reduce the feed bill.
3. **Independent expert advice** to analyse the supplement – least cost ration; cost of gain; animal requirements. This could cost $2000-$5000 annually (1-3% of the total supplement bill), and has the potential to save upwards of $50,000.

Results from ProfitProbe™ in 2006 indicated the top 20% of producers for this region have 40% less supplementary feeding costs to produce a kilogram of meat than two of the three case-study properties ($0.20/kg vs $0.35/kg), suggesting there is potential room for improvement in some property's feeding strategies.

There is no miraculous feed recipe that will solve all the nutritional challenges breeder herds face. A combination of well informed decisions in cattle, land and business management is critical.

Gross Margin and Turnover for Cattle (Meat)

Farm Area (ha):		as % of Gross Product:	84.50%
Effective Area (ha):		Cattle Meat Weight Produced (kg):	560,426
Animals (LSU):			

Measure	Your Business Results			Group Results $/kg		Group Results $/LSU	
	$	$/kg	$/LSU	Top 20%	Average	Top 20%	Average
GROSS PRODUCT - GP		1.65	132.70	2.37	1.96	343.95	196.50
This is made up of...							
Animal Sales Income		1.54	124.36	3.93	2.68	570.87	269.06
+ Milk Sales Income	0	0.00	0.00	0.00	0.00	0.00	0.00
+ Wool/Fibre Sales Income	0	0.00	0.00	0.00	0.00	0.00	0.00
+ Change in Livestock Inventory	86,388						
- Animal Purchases	28,400						
Direct Cost Summary							
Supplements & Fodder	194,055	0.35	27.90	0.20	0.18	28.59	18.18
Labour	28,231	0.05	4.06	0.07	0.08	9.78	7.72
Animal Health	12,407	0.02	1.78	0.03	0.04	4.31	3.70
Other	13,423	0.02	1.93	0.00	0.00	0.00	0.21
Crop Transfers & Feed	0	0.00	0.00	0.00	0.00	0.00	0.00
Agistment	29,465	0.05	4.24	0.00	0.01	0.00	0.74
TOTAL PRODUCTION COSTS - PC	277,581	0.50	39.91	0.29	0.30	42.68	30.55
Freight and Selling	65,912	0.12	9.48	0.11	0.13	16.25	12.81
Other	0	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL POST PRODUCTION COSTS	65,912	0.12	9.48	0.11	0.13	16.25	12.81
TOTAL DIRECT COSTS - DC	343,493	0.61	49.39	0.41	0.43	58.93	43.36

Figure 7. Example of ProfitProbe™ software output

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Project team

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