



Breeder Management Field Day

Improving profitability through improved fertility

“Oaklands” Duaringa
Tuesday 30th July 2013





Byrony Daniels

Beef Extension Officer

DAFF Emerald

4983 7467

0427 746 434

byrony.daniels@daff.qld.gov.au

Steven Bray

Senior Scientist, Sustainable

Grazing Systems

DAFF Rockhampton

4936 0243

0428 103 072

steven.bray@daff.qld.gov.au

Mick Sullivan

Principal Beef Extension Officer

DAFF Rockhampton

4936 0239

0428 104 374

mick.sullivan@daff.qld.gov.au

Ken Murphy

Senior Beef Extension Officer

DAFF Rockhampton

4936 0337

0419 658 412

ken.murphy@daff.qld.gov.au





Agenda





What records should we keep that will help us in managing our beef business?

Keeping records is a job that we all mean to do but often doesn't happen. Keeping records that are no use is a total waste of time.

It is important to keep records that are needed for auditing or tax as well as planning management.

Paddock books are a good way to get used to keeping records. Have an exercise book for each paddock and below is a list of things that might be useful.

Stock records

- Stock numbers i.e. cattle in and out, deaths, mustering numbers
- Individual animal lists if using individual identification
- Pregnancy test results/ calves branded/ weaning numbers
- Vaccinations - product/ date/ batch numbers
- Sales numbers, weights and prices
- Weight data i.e. liveweights and weight gains

Paddock records

- Physical details i.e. paddock area, areas of land types
- Infrastructure details i.e. waters, fences
- Water and soil test results
- Weed and pest management i.e. timber/ regrowth control, weed treatments, pest control
- Labour time in paddock – mustering/ poisoning/ water infrastructure repairs
- Photos – pastures quality and quantity/ regrowth/ stock condition
- Pasture development and cultivation details and costs

Remember to date every activity and entry!!!!!!!!!!!!!!

Evaluating Breeder Performance

Breeder performance is probably the most talked about subject in the beef industry but it is hard to measure and even harder to assess.

There are two components to evaluating breeder performance:

1. Measuring the performance of the breeders e.g. weaning rate
2. Assessing the breeder performance e.g. is the performance of a paddock or property good or bad, how it compares to other paddocks, properties and land types.

The length of the reproductive cycle and resulting overlap between reproductive cycles i.e. calf drops is a major problem even without the difficulties caused by getting clean musters, animals going missing and seasonal variability.

The table below shows the reproductive cycle for No 3 weaners in a herd with a four month mating period and the overlap with the reproductive cycle for the No 4 weaners.

Activity	Date	Time elapsed No 3s cycle (months)
Mating for No 3 calving commences	1 Dec 2011	0
Mating for No 3 calving ends	31 Mar 2012	4
Pregnancy test for No 3 calving	1 Jun 2012	6
No 3 Calving commences	9 Sep 2012	9.3
Mating for No 4 calving commences	1 Dec 2012	12
Branding No 3s	15 Dec 2012	12.5
No 3 Calving ends	7 Jan 2013	13.3
Mating for No 4 calving ends, brand late No 3s	31 Mar 2013	16
Weaning No 3s & Pregnancy test for No 4 calving	1 Jun 2013	18

Measures of breeder performance fall into four broad categories.

Performance percentages derived from stock numbers

- Pregnancy rates
- Branding rates
- Weaning rates



Reproductive loss percentages calculated from stock numbers

- Foetal and or calf loss from pregnancy test to branding
- Calf loss from branding to weaning
- Foetal and or calf loss from pregnancy test to weaning

Weaner weights

- Average weights
- Weight ranges i.e. number 161-180 kg, 181-200 kg etc

Performance ratios and benchmarks derived from stock numbers and liveweight data

- Average weight of calf weaned per cow mated
- Average weight of calf weaned per 100 kg cow mated

Complications

A number of potential complications have to be considered when measuring and assessing breeder performance:

- Financial versus calendar year branding
- Maintaining accurate stock numbers over 18 months for each calf drop
- Multiple brandings and weanings. Most control mated herds have a straggler branding and it is common to wean the tail later.
- In year round mated herds there can be simultaneous branding and weaning of mixed ages of calves. On the 2013 first round there could have been:
 - weaning of No 2 branded calves
 - branding and weaning of No 3 cleanskins
 - branding of No 3s which go back with the cows.
- There are a number of opportunities to sell breeders from mob during production cycle
- Timing of brandings and weanings and variation from year to year
- Timing of culling and sale of cull females from breeder groups and variation from year to year
- Seasonal conditions may require sales which affect numbers and consistency of numbers from paddock to paddock and year to year i.e. selling PTIC cows.

These complications are more of a problem when comparing between properties. When looking at an individual property there impact can be better understood and allowed for.

The usefulness of apparently more sophisticated ratios and benchmarks has to be questioned in commercial herds. Many properties have trouble establishing the numbers of cows mated i.e. number of breeders in the paddock 18 months ago let alone the weight of the cows. You could calculate *calves branded per km of boundary fence*.



The challenge is to develop a method that is:

- easy to use in your situation
- provides useful comparisons between paddocks/breeder groups and years
- useful for key people i.e. family, staff and banks.

Be honest with yourself; were the 800 No 3 calves produced from the mating of 1,000 cows or 1,500 cows?

Creative accounting techniques include;

- counting “immaculate” and early calves from heifers in the overall calf count without counting the heifers
- counting calves from “cull” cows in the overall calf count without counting the “cull” cows.



Weaning rate

A good measure of breeder productivity is weaning rate as weaners are the end product of the breeding cycle. Weaning rate is the number of calves weaned for every hundred cows exposed to the bulls. This can be affected by many factors and it is important for the profitability of a beef business to keep the level as high as possible whilst being careful with the costs involved. For example high cost energy and protein supplements can be used weaning rates but does it pay?

What pregnancy and weaning rates are acceptable in your country?

Do I know what my figures are?

Pregnancy Rate _____%

Branding Rate _____%

Weaning Rate _____%



Measuring breeder performance

How should pregnancy, branding and weaning rates be calculated?

You and industry need to be comparing the same thing from paddock to paddock, year to year, property to property!

$$\text{Pregnancy \%} = \frac{\text{No. of cows PTIC}}{\text{No. of cows mated to produce the pregnancies}} \times 100$$

$$\text{Branding \%} = \frac{\text{No. calves branded in 12 months}}{\text{No. cows mated in 12 months to produce the calves}} \times 100$$

$$\text{Weaning \%} = \frac{\text{No. calves weaned in 12 months}}{\text{No. cows mated in 12 months to produce the weaners}} \times 100$$

For No 3 calves, the cows mated will be the cows mated from late 2011 to early 2012. For the 2013 pregnancy test data the cows mated will be cows mated from late 2012 to early 2013.

Year round mated herds

To be meaningful branding and weaning rates need to be calculated for a 12 month period. If paddock records are reasonable it is possible to work back and establish the number of cows being mated in late 2011 to early-mid 2012 that produced the No 3 weaners. However, the impact of cow sales needs to be considered i.e. if a cow is sold she cannot produce a calf but if pregnancy testing is used to cull cows the weaning rate can be artificially increased.

Because of the difficulties of these calculations some other approaches used include:

- for herds with financial year branding and weaning percentages on cows present at 1 Jul
- for herds with calendar year branding calculate branding and weaning percentages on cows present at 1 Jan
- calculate branding and weaning percentages on cows present at end of second round muster i.e. Aug - Oct
- Calves weaned as percentage of all females on property excluding the weaner heifer cohort for the year in question.



Getting pregnant and staying pregnant is complex

- 60% conception per cycle is the best in most extensive herds
- Reproductive wastage
 - Fertilisation failure - 10%
 - Early embryonic loss - 20%
 - Late embryonic loss - 5%
- These losses are not well understood and no solutions soon
- Vibriosis and trichomoniasis can drop conception to 30% per cycle

How much time have you got?

Days in year	365
Average Brahman pregnancy	290 days
Time between calving and first cycle	42 days approx.
That leaves	33 days
Cycles to get cow back in calf	1.5

Many cannot do it - calving drift

What is the issue?

- If cows are not cycling they cannot get pregnant
- No of cows cycling and timing is the real issue
 - What is the main impediment to cycling?

Body Condition and Conception Rates

End of dry season body condition is critical because cows' ovaries are preparing for next pregnancy while still pregnant

End of dry season body condition and expected pregnancy rates

Body Condition Score (BCS)	Description	Expected pregnancy rate next mating (%)
1	Poor	0 - 40
2	Backward store	20 - 50
3	Store	40 - 80
4	Forward store	60 - 90
5	Fat	80 - 95

Poor – BCS 1



Backward store – BCS 2



Store – BCS 3

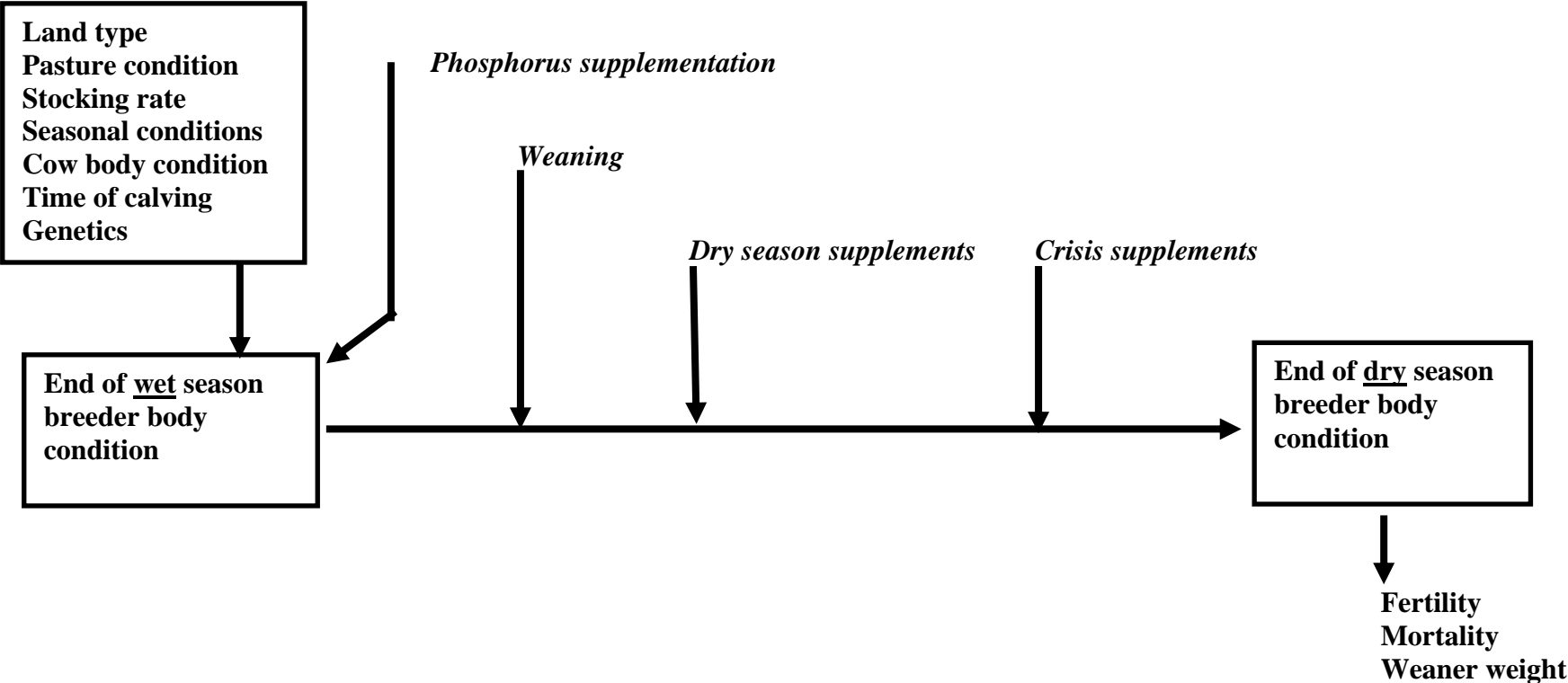


Forward store - BCS 4





What affects breeder body condition and productivity (Dixon, 1998)





Intake and requirements 400 kg breeder

Month	Pasture crude protein (%)	Pasture digestibility (%)	Energy intake (MJ)	Protein Intake (g)
Nov	5.0	50	44	340
Feb	9.0	60	85	900
Requirements				
Dry early pregnant			46	360
Lactating with calf to 4 months			75	864

Breeders require reserves to handle periods when diet is below maintenance



What are our Management Options other than supplementing to keep our cows in a body condition score of 3 or better?

- Stocking rate management
- Weaning
- Controlling when our calves are born (Controlled mating)
- Pregnancy-testing and consequential management

Stocking rate management

Do you generally find paddocks running out of grass each year towards the end of the dry season? Do you have a lot of undesirable weeds and grasses? Would you struggle to get enough fuel for a fire most years?

If the answer to these questions is “yes”, then you will lift your profits if you reduce your stocking rate.

Having the flexibility to burn occasionally will allow a cheap form of timber control but also a reserve should the season fail.

Pastures will be stronger, less susceptible to weed invasion and will stay greener longer into the dry season. Animal productivity will be higher as a result. As part of a management package, this should result in higher breeder performance; more weaners and bullocks.

There are methods of pasture budgeting to prevent overstocking and could be a topic for a future field day.

Weaning

Weaning is the most important tool after stocking rate for managing breeder body condition. Lactation is a major drawback to a breeder’s body condition. Weaning during the autumn early winter reduces the effects of the dry (winter) season. It is often said that the best supplement a breeder can receive is to wean the calf.



- **Weaning saves**
 - **10 - 15 kg/month in early-mid dry season**
 - **5 - 10 kg/month in late dry season**
- **Twice the impact of dry season urea supplements**
- **1 BCS ~ 30-50 kg liveweight**
- **Early weaning demonstrations have shown 10-15% higher weaning rates**
- **Timing is absolutely critical**

Looking after the weaner

- **Many weaners struggle due to poor management**
- **Have the right supplement for the type of weaners being weaned**
- **Early weaners (100-160 kg) require a energy and protein supplement i.e. protein meal, fortified molasses, weaner meals**
- **Segregate weaners on size and condition to reduce bullying**
- **Have your supplement in the yards ready to go**
- **Clean water, change it regularly**

For more information grab a copy of 'Weaner Management in Northern Beef Herds'.



Pregnancy Testing

- **Valuable tool in any management system**
 - **Identify non performers**
 - **Identify less profitable animals**
 - **Segregate animals for management and marketing**
- **Accuracy is critical to maximise value**
- **Record heifer weights**
- **Record Body Condition Scores**

Evaluating pregnancy test results

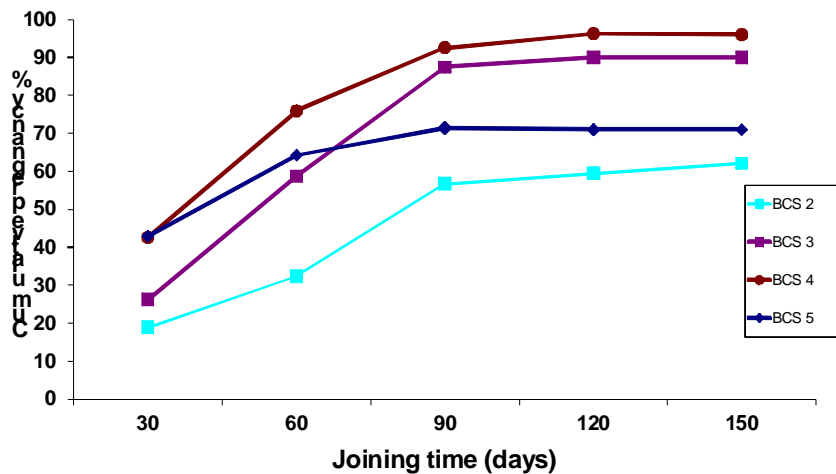
- **What was the pregnancy rate?**
- **What was the pattern of conceptions?**
- **What does it mean for next calving?**
- **What does it mean for future business performance?**

Monitor Heifer weights

Impact of heifer weights on conception rates

Year	1999	2002
Av heifer weight (kg)	402	388
Pregnancy (%)	91	79

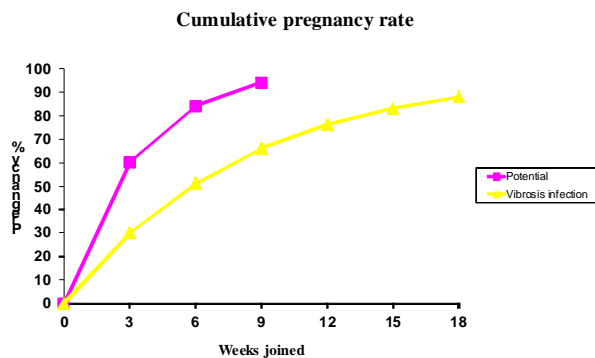
Monitor Breeder Body Condition



Monitoring for Fertility diseases

In any herd it is important to ensure that losses are not caused by fertility diseases. Disease is not as noticeable in year round mated herds as cows have more time to conceive.

- Vibriosis – Vaccinate your bulls, cull bulls at 7, cull empty cows and cows that fail to calve, join maiden bulls to maiden heifers
- Leptospirosis – Vaccinate your cows
- Trichomoniasis – cull bulls at 7, cull empty cows and cows that fail to calve, join maiden bulls to maiden heifers
- Pestivirus – targeted testing to determine risk





Getting Started with Controlled Mating

Recent work across northern Australia (Cash Cow project) has shown that breeders that calved during the July to September period had up to 40% less chance of getting into calf the following season than breeders that calved in the December to January period. In central Queensland a good rule of thumb is to get all the calves on the ground before Christmas. This allows the breeder to lactate during the flush of the summer season to produce a weaner as the season is going off during winter.

Maiden heifers are a good place to start. Whether you are mating yearling heifers or two year olds, the management considerations are the same.

Country type will have a huge impact on whether you mate yearlings or two year old heifers. Animals should weigh approximately 300 kg to be cycling and animals can be selected on weight to insure good fertility rates. Results from the CRC indicate that Brahman heifers develop their first corpus luteum at around 334 kg whilst Tropical Composite heifers do so at around 329 kg. These weights equate to around 750 days of age for Brahmans and 650 days for Tropical Composites. There was considerable individual animal variation within each group.

When the country is suffering the effects of drought, supplementing dry heifers is often not a priority in dry times when most importance is given to pregnant or lactating breeders.

Mating heifers a month earlier than older breeders is common to ensure that there is more chance of getting them back in calf after their first calving. This often means that mating should occur in December. Many years the season can still be dry in November/ December so supplementing will be necessary. Remember though that your heifers will have calves that are a month older than the calves of your older breeders when you plan your weaning.

Older breeders can be handled differently. If they are currently mated year round most of the calves are probably arriving in the spring period (preferred period). Tidying up can be done with the outsiders at pregnancy testing time.

Look hard at the cows that will be calving outside the preferred period. Are they so valuable to your herd that you must keep them? During the August to December period summer storms (if they occur) can 'kick start' nutrition improvement and calves should be old enough to avoid cyclonic rainfall events and be old enough (rumen well developed) to utilise the nutrition on offer. Calves will also be of sufficient age to wean in the April May period. Weaning is a most important management tool to maintain breeder condition. Energy intake requirements for breeders reduces from about 80 MJ Dry matter per day to 50 MJ Dry matter day if the pressure of lactation is removed.



If 'out of season' breeders must be kept, place them in a separate paddock where they can be managed/supplemented appropriately into spring calving. It will be necessary for them to have a longer inter-calving period or a very short inter-calving period. Shortening the period can be very difficult so it is most likely that they will be waiting a few extra months for mating.

During dry years it may be very beneficial to sell these breeders to concentrate on the majority of the breeders which are aligned to expected seasonal conditions. Out of season breeders are generally a greater drought risk. They require larger amounts of supplement or have calves that need to be weaned at dry times of the year meaning another feeding task when there is already too much to do.

Reducing the mating period gradually is often spoken about as the best way to move into a controlled mating programme. Unfortunately it can make the changeover take years while a pregnancy test in late autumn can give you a great result in one year. Sell the out of season breeders and store the money into Farm Management Deposits or maybe even go on that long overdue holiday.

In years with late breaks to the season don't be tempted to leave the bulls in longer. This will only start the out of season calving again. Late calves are always the tail; the bullocks that take the extra year to finish.

It is important to manage breeders to calve during the October – December period. This can be assisted by removing breeders from the herd during pregnancy diagnosis if they are due to calve outside this period.

Low protein and energy during the last trimester of pregnancy is also a major factor in pregnancy rates. In central Queensland, protein is generally more important than energy and feeding protein will assist in maintaining body condition.

Once the calf is born losses can also be heavy. Maiden heifers have been found to have higher calf losses than mature breeders. Calves born during periods of extreme heat and humidity can also be badly affected. We cannot change weather conditions but we can provide adequate shade to minimise the effects. It is also important not to disturb the animals at this time as mustering can cause heavy losses.

Remember that what we do with our breeders this year affects their productivity next year.

The Cash Cow project also found that cows that lost a calf one year often do the same again the following year.

Improving Pregnancy Rates in Young Breeders

Management

- Ideal calving time is 6 weeks prior to break in season.
- Calving completed by Christmas.
- Late calves are older at puberty – puberty related to body weight.
- Important to pregnancy diagnose with foetal aging so pregnant animals can be better nourished and supplements not used on empty animals.
- Wet cows in wet season; dry cows in dry season.
- Autumn is time to wean pregnancy diagnose, assess pasture and set stocking rates for coming year.
- Foetal calf loss from pregnancy to weaning in well managed herds with low exposure to reproductive diseases is 12% (5% pre-natal, 4% peri-natal and 3% post-natal.) with a 4-60% variation. Peri and post natal losses highest in first calf heifers.
- Foetal calf loss of 20% is considered normal for first calf heifers.
- Suitable vaccination programmes need to be developed.
- Select animals suited to the environment.
- Select paddocks that minimise the detrimental effects of environmental factors for newly born animals.
- Ensure the correct proportion of male animals to female animals.

Nutrition

- Increasing liveweight and body condition through supplementation increases fertility in maiden heifers. Aim for a live weight of 275 kg at start of mating.
- Feeding 300g Whole Cottonseed daily through the post weaning dry season reduced the age of oestrus by 1.4 months at Swans lagoon. (Fordyce)
- Cottonseed meal has been used to increase pregnancies by 20% in yearling mated heifers.
- Under-nutrition increases the variability of onset of puberty.
- Supplementing post weaning reduces age of puberty and in turn increases pregnancy rates.
- Beef CRC found weight at puberty was 334kg (196 – 485kg range)
- (Cundiff, Nebraska) found 83% Brahman cross heifers fell pregnant when 400 day liveweight was above 347kg.
- Pre-calving nutrition has a large effect on PPAI (post partum anoestrus interval)
- A big drop in body condition post calving needs a bigger lift in body condition than if body condition is maintained, to get animal back in calf.
- 86% pregnancy was gained from supplementing first calf heifers at Swans Lagoon (Dixon)



- Breeders <340 kg increased pregnancy rates by 5% for every 10kg gain in body weight. Breeders >340 kg increased pregnancy rates by 3% for every 10 kg gain in body weight.
- Spike feeding – A high quality supplement fed for 50 days (6- 8 weeks pre calving to heifers produced an increase in pregnancy rates of 15 – 25% in good seasons; beware of the costs. May use legumes such as stylos or leucaena for same effect.
- On Phosphate deficient country, feeding Phosphorus supplement during the summer period and year round on grossly deficient country can improve fertility rates by 23%.

Genetics

- Selection for fertility (age of puberty) can produce a 35% increase yearling mating pregnancies.
- Selecting for bulls for larger scrotal size will produce heifers that reach puberty earlier.
- Selecting larger framed animals produces animals that reach puberty later.
- Larger framed animals are later maturing and have lower body condition for the same weight.
- Bos indicus reach puberty later than Bos taurus with hybrids in between.
- Be CAREFUL when selecting bulls for high body weight in case they also have high birth weight – Dystocia is a big problem for yearling matings.

Climate

- Climatically adapted animals maintain fertility. Bos indicus animals are most suited to tropical northern Australian conditions.
- Increasing daylight hours causes earlier pre-pubertal development.

Using genetics to improve fertility

- In every herd a percentage of cows conceive and produce a calf at the right time each year regardless of season
- Why can't all of them do it?
- Genetics is a largely untapped resource in the beef industry
- Excuses is a major problem in stud and commercial herds, *she's a lovely cow, she had a good calf last year*
- Superior performance i.e. fertility, growth and carcass from same AEs with same direct costs
- Genetics changed pigs and chickens
- Great variations between sires in fertility of their daughters
- Ability to conceive during lactation is heritable
 - Brahmans - 52% heritability
 - Tropical composites - 25% heritability



Brahman sires

**heifer
age
at
puberty
Trial EBVs
(days)**

BELMONT 510/97	-185
LANCEFIELD 4999M	-148
BELMONT 268/97	-145
BELMONT 79/96	-143
LANCEFIELD DESTINY	-139
TARTRUS ABEL MANSO	-99
NEWCASTLE WATERS TOBY	-89
CONA CREEK 2652	-85
LANCEFIELD 4461	-83
WAVERLEY QUARTZ DE MANSO	-82
.	.
.	.
TARTRUS CRUZ MANSO	47
LANCEFIELD AMBITION	56
JDH MANGUM MANSO	68
TARTRUS 3292	68
CARINYA MAX	69
ALLAWAH M119	75
ALLAWAH M90	89
CONA CREEK EQ773	137
ALLAWAH M137	145
CONA CREEK 3062	154

**5.6
month
difference
daughter's
age
at
puberty**

Impact on maiden calving rate, many not pubertal at 1st mating

AGBU



Future Beef



Brahman sires

**lactation
anoestrus
interval**

Trial EBVs

(days)

(Wet 1st calf cows)

LANCEFIELD 4999M	-100
MR V8 797/3	-95
TARTRUS 3886	-89
CONA CREEK 2722	-71
NEWCASTLE WATERS TOBY	-63
LANCEFIELD 4461	-60
McKELLAR RICARDO	-58
TARTRUS ABEL MANSO	-55
BELMONT 96-478	-52
CARINYA 1926	-40
.	.
.	.
CBV PROVIDOR	51
CARINYA MAX	54
TARTRUS 2415	57
TARTRUS 3292	62
JDH DENVER DE MANSO	63
LANCEFIELD AMBITION	65
LYNDHURST 1660/7	73
WAVERLEY SUPREME DE MANSO	79
TARTRUS MR MANSO 025	114
BELMONT 79/96	169

4.4
month
difference
in time
1st calf
daughters
to
resume
cycling

Large genetic differences – big impact on calving rate



Queensland
Government



Australian Government
Department of Agriculture,
Fisheries and Forestry





What can I take from today and do now?

What can I take from today and plan to do later?

**Do I need additional information or skills?
What are they and where can I get them?**



Climate Clever Beef

Cattle versus carbon. The tug of war begins.

Introduction

Governments around the world are attempting to reduce the amount of greenhouse gases in the atmosphere. Australian beef producers (responsible for 11% of Australia's reported emissions) can theoretically participate in a voluntary national carbon offsets scheme (Carbon Farming Initiative). The Climate Clever Beef project is assessing the business case for integrating carbon farming practices into beef businesses.

Can a beef business sequester carbon and reduce greenhouse gas emissions, is carbon farming an opportunity, a new income stream, or a distraction from productivity with no profitability or efficiency advantages.

Methods

A case study site has been established on the 10,570 ha Oaklands property owned by the Dunne family, 80km south of Duaringa, in central Queensland. The case study will involve on-ground assessment of the pasture, land condition, woody vegetation, soil carbon and beef herd dynamics. Whole property modelling will be used to assess scenarios over time and across the property.

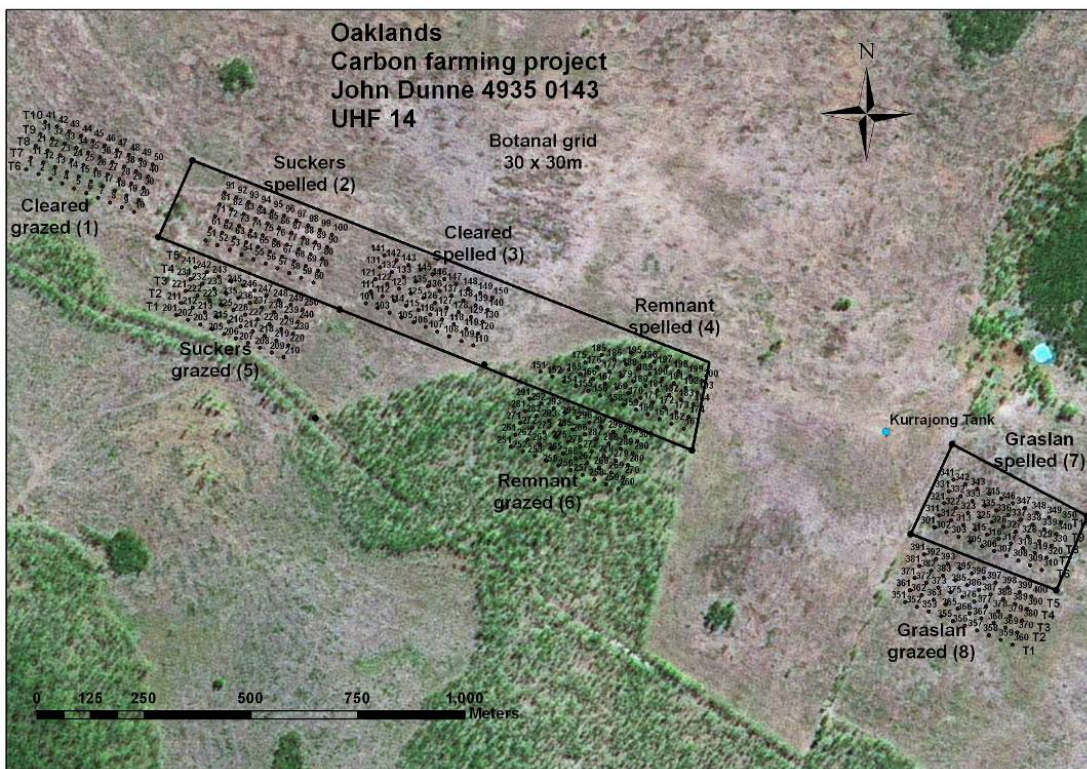


Photo 1. Trial site on Oaklands



The treatments being measured will utilise the current woody vegetation variation at the site: remnant box woodland, retained 10 year old box regrowth, recently cleared 10 year old box regrowth and completely cleared with Grasp herbicide 10 years ago (Photo 1). For each vegetation type, two grazing treatments have been applied - continuously grazed and wet season spelled. Utilising the existing woody vegetation differences will allow comparisons of soil and vegetation carbon to be made at the start of the project and vegetation carbon change and land condition over the three years of the project.

Results and Discussion

Tree carbon assessments indicate that remnant woody vegetation contained 5-8 times more carbon than 10 year old woody regrowth indicating substantial scope for carbon storage by allowing regrowth vegetation to regrow (Fig. 1).

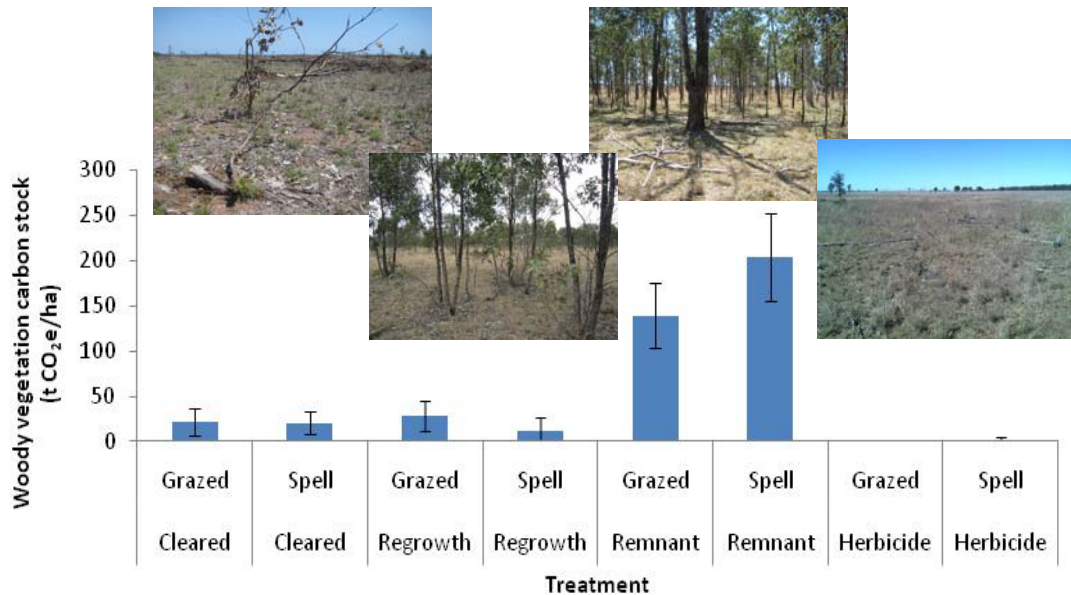


Fig. 1: Woody vegetation carbon stock and representative photos. Cleared plots were measured before chaining.

Pasture assessments in May 2013 six months after spelling began, indicated improved pasture biomass with a 6-month spell in the regrowth and recently cleared areas (Fig. 2) and a slight improvement in land condition.

Two herd scenarios have been initially evaluated (Table 1). The base herd scenario (current situation) has 1005 breeders mated and 68% weaning rate. Heifers are joined at two years of age. Spayed heifers go to a separate fattening property before 24 months. Cull cows are spayed and sold straight to the meatworks after fattening. The weaner steers go to the fattening property.

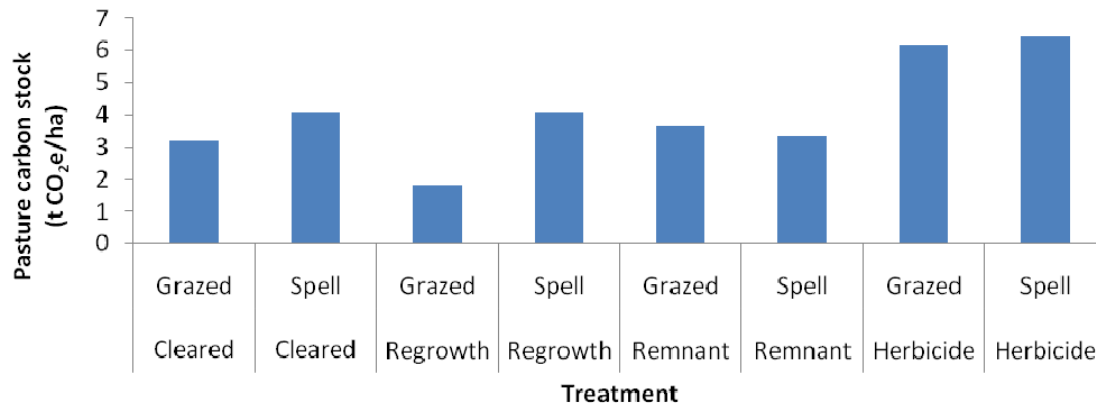


Fig. 2: Pasture biomass 6 months after establishment of treatments. The herbicide treatments were in a separate paddock and in better land condition.

Table 1: Breedcow herd and greenhouse gas emissions data.

Scenario	GM/AE	GM herd	Herd emissions (t CO ₂ e)	Emissions intensity (t CO ₂ e per t LW sold)
Current Situation 1,552 AE	\$125	\$194,000	2,606	13.6 (191 t LW)
Reduce stocking rate by 10% increase weaning rates, supplement 4 months of year	\$130	\$182,000	2,324	12.6 (184 t LW)

Management sees the current stocking rate as unsustainable due to low pasture biomass and poor land condition in some paddocks, in addition if the decision is made to retain regrowth for carbon trading, stocking rates will need to be lowered. The 2nd scenario involves having a lower stocking rate (896 breeders) and supplementing the cows for three months in the dry season increasing weaning rate to 75%. Herd gross margin declined by 7% with reduced stocking rate even though gross margin per adult equivalent improved by 4%. The cost of supplement offset productivity gains. Reducing stocking rate by 10% reduced livestock emissions by 10%, however combined with providing supplement, herd emissions intensity improved by 8%.

Next steps

Ongoing evaluations will assess the balance between profitability, emissions and land condition for a range of woody regrowth retention levels, stocking rate adjustments and supplementation.

Acknowledgements

Thank you to John Dunne and family and the Mimosa Creek Landcare Group for their support and enthusiasm for the project.