

# Rangelands MEMO

Copyright © Western Australian Agriculture Authority, 2012



August 2012

ISSN 1033-5757

Vol. 2, No. 2

EDITOR: Matthew Fletcher  
PO Box 19, Kununurra WA 6743

Phone: (08) 9166 4019  
Email: [matthew.fletcher@agric.wa.gov.au](mailto:matthew.fletcher@agric.wa.gov.au)

## CONTENTS

Letter from the editor .....	2
Rainfall maps .....	3
The distribution of pure dingoes and dingo-dog hybrids in Australia .....	4
Best prac for dried meat baits – get the most out of your baiting program .....	6
Weebo goat/Maremma trial .....	8
Guard dog experiences of Queensland pastoralists Jim and Rod Allpass from Barcaldine .....	10
Roland Nicholls – 30 years of service .....	12
Producer tour – Katherine, NT .....	13
Breeding for fertility – EBVs .....	15
Who's ya Daddy? .....	16
Selecting more productive replacement females .....	17
Wet season phosphorus – start doing the numbers now .....	20
FutureBeef .....	22
Service fees & charges for livestock inspections 2012/13 .....	23
Bovine Johne's disease (BJD) – why we need to keep looking .....	25
Lambo station, new yards – new era .....	26
Big in-roads for prickly acacia control – on track for eradication in Western Australia .....	27
Mesquite – Tackling a prickly problem in Carnarvon .....	29
Biosecurity Industry Funding Schemes for 2012–13 .....	30
Nutritional energy production and landscape function in the Southern Rangelands .....	31
Common 'Indicator' shrubland species .....	33
Range Condition Monitoring (RCM) – a site peg alternative .....	34
DAFWA contacts following Range Condition Monitoring workshops in the Northern Rangelands .....	35
Update: Grazing Land Management package – Pilbara .....	36
Soil carbon modelling for the rangelands .....	36
Great opportunities for sustainable agriculture .....	38
A Norwegian aid to weather prediction .....	39
Notice to all cattle producers .....	39
Cattle Market Update – 3 August 2012 .....	40

## LETTER FROM THE EDITOR

It is a pleasure to send out the August *Rangelands Memo*—it is overflowing with articles relevant to land managers.

Following on from the excellent response to the article ‘Population genetics of wild dogs in Western Australia’, featured in the April *Rangelands Memo*, another article from Danielle Stephen’s PhD has been included on ‘**The distribution of pure dingoes and dingo-dog hybrids in Australia**’. A survey of 2284 wild dog DNA samples from across Western Australia were combined with 1353 DNA samples from other states and analysed to provide the most comprehensive study to date of hybridisation between dogs and dingoes. On page 4 there is an eye-catching map showing the distribution of pure dingoes and dingo-dog hybrids across Australia. It is clear to see from the map where populations of pure dingoes and dingo-dog hybrids are most common.

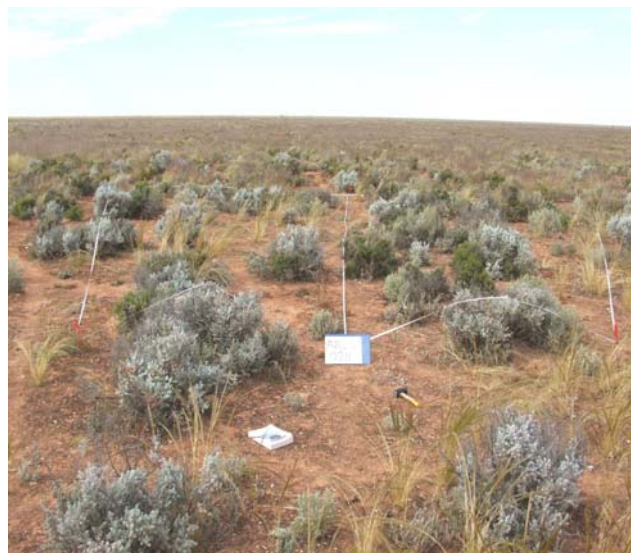
Fittingly, Callum McDonald has penned an article on ‘Best prac for dried meat baits — get the most out of your baiting program’. Callum gives some pointers for producers **planning on building a baiting rack**, discussing the most appropriate sized mesh to use, rack height and width and the need for a covering layer of mesh. Best practice information on cutting baits to size and placing them on the rack is also discussed in the Memo.

Peter Smith and Anne Marie Huey have contributed timely articles on ‘**selecting more productive replacement females**’ and ‘**breeding for fertility**’. Stations have completed their first round of mustering, counted the number of calves branded and pregnancy testing has begun—producers by now have a good idea of how productive their herd is. Peter’s article discusses how to identify unproductive first mated females, understanding ‘heifer age and weight on puberty’ and genetic improvement by selecting bulls with the right genes. Anne-Marie’s article reflects on advances in genetic information available to producers and the importance of using objective measures, such as Estimated Breeding Values (EBVs), when buying bulls.

Although it is too early to be feeding wet season phosphorus (P), it is a good time to consider: Would feeding P over the 2012/13 wet season be cost-effective? An article put together by the FutureBeef team to help answer this question is in the Memo. The article also anticipates the soon to be released publication ‘**Feeding phosphorus to beef cattle in northern Australia**’ by Meat and Livestock Australia. If you do not order a copy direct, contact your local DAFWA office for a copy.

Congratulations to Roland Nicholls who recently celebrated 30 years of service with DAFWA.

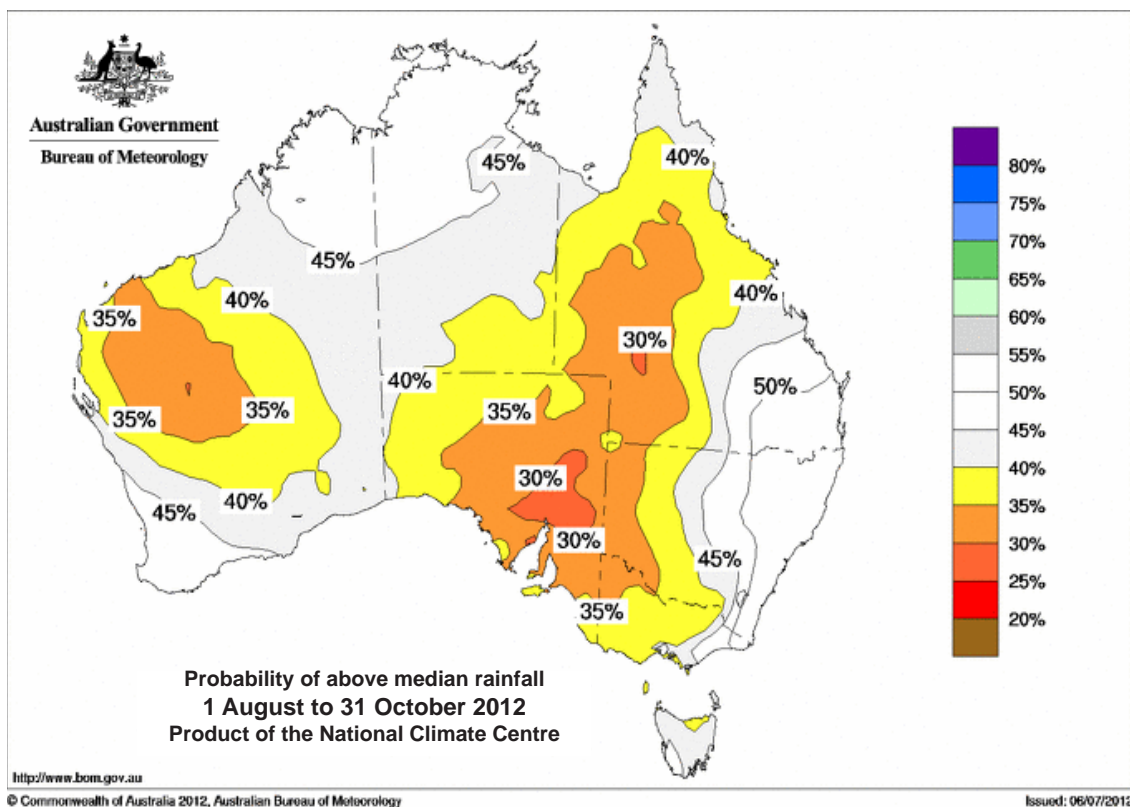
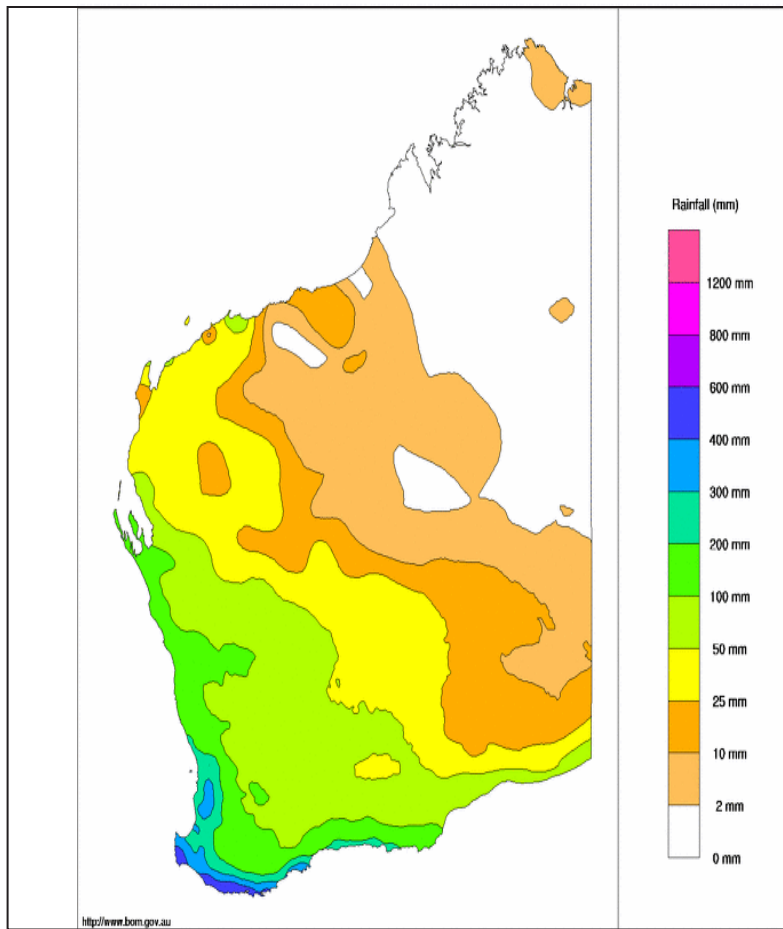
*Matthew Fletcher*



*Range Condition Monitoring site: Arubiddy land system, chenopod (saltbush/bluebush) shrubland pasture. Species present: bladder saltbush, pearl bluebush, George’s bluebush, samphire and stipa speargrass. Range condition: fair to good.*

Front page photos: *Ronaldson Bros & Tippett (diesel engine), 1939 – Murray Shiner, Kununurra. These diesel engines were used to drive bucket elevators at grain receipt sites throughout the WA wheat belt, up until the early 1970s. Massey Ferguson tractor, Belle Station, Murchison – Kristie Parker, Broome. 1950s Austin Loadstar truck, Dalwallinu – Photographer, Bron Cooke, [www.musteringthekimberley.com](http://www.musteringthekimberley.com)*

Western Australian Rainfall Totals (mm) 1 May to 31 July 2012  
Product of the National Climate Centre



# THE DISTRIBUTION OF PURE DINGOES AND DINGO-DOG HYBRIDS IN AUSTRALIA

Danielle Stephens, Research Associate, Helix Molecular Solutions and  
Malcolm Kennedy, Research Officer, DAFWA

In the last *Rangelands Memo*, we provided a summary of the genetic structure of wild dog populations in Western Australia. This study was conducted by Danielle Stephens as part of her PhD at the University of Western Australia. Here we provide an overview of a study of hybridisation between dingoes and domestic dogs in Australia which also formed part of Danielle's PhD.

## Interbreeding between dingoes and wild dogs

Dingoes were transported to Australia from mainland South-East Asia and Indonesia 5000–18 000 years ago and spread swiftly across mainland Australia, probably with human assistance. Domestic dogs have been in Australia since the arrival of the First Fleet and have subsequently been interbreeding with dingoes to create hybrids. Interbreeding between dogs and dingoes has progressed rapidly and continues to do so. If interbreeding affects wild dog/dingo characteristics such as body size, pack structure, prey preference and their ecological role, there may be implications for wild dog management. Physical characteristics like pelt colour are not reliable indicators of hybridisation. However, DNA testing provides a better determination of dingo 'purity'.

A survey of 2284 wild dog DNA samples from across Western Australia was undertaken with the assistance of over 76 different land managers. These samples were combined with 1353 DNA samples from other states and analysed to provide the most comprehensive study to date of hybridisation between dogs and dingoes (Figure 1).

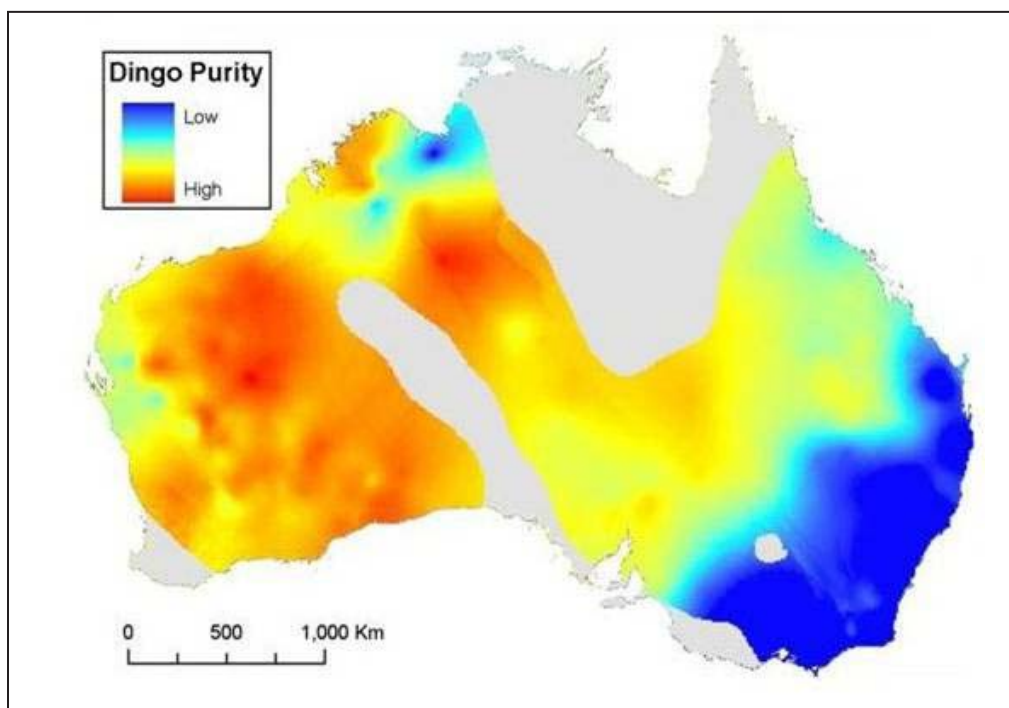


Figure 1 Purity levels of 3637 wild dog samples, showing the distribution of pure dingoes and dingo-dog hybrids. Grey areas were not sampled in this study (Stephens 2011).

Areas in the south-east of Australia showed a very high proportion of hybrids (Figure 2). The degree of interbreeding was lower in other states. The highest proportion of dingoes was found in the Northern Territory (88%), and the second-highest proportion was in Western Australia with 62% of all dogs tested being pure dingoes in this state. As expected, more remote areas had more pure dingoes, but hybrids were found in every region studied. Surprisingly, very few wild-caught domestic dogs were found, with almost all wild dogs showing some dingo ancestry. This suggests interbreeding is most likely to be caused by roaming dogs mating with dingo bitches, which are then able to raise a litter in the wild. High numbers of crossbred dogs may then result through breeding among hybrids.

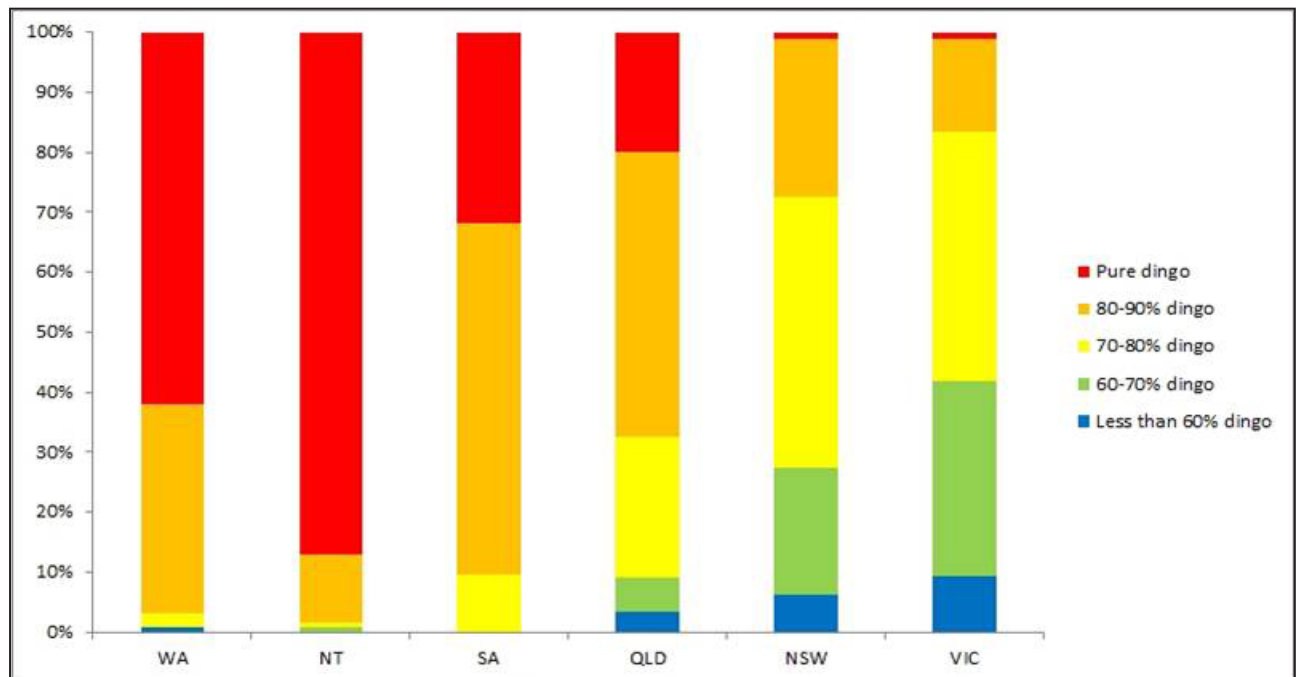


Figure 2 Percentages of pure dingoes and hybrid dogs found in each state

### What does this mean for wild dog management?

In Western Australia genetic purity does not affect management options for wild dog control available to landholders. However, it is currently uncertain whether dingoes and hybrid dogs show consistent differences in diet, movement, predation, behaviour and social structure. Identification of dingoes is therefore an important first step to study whether hybrids pose any greater threat to stock and wildlife than dingoes, and to gain a better understanding of the ecology of wild dogs in Australian ecosystems.

Contact: Malcolm Kennedy, Research Officer, Department of Agriculture and Food WA

Email: [malcolm.kennedy@agric.wa.gov.au](mailto:malcolm.kennedy@agric.wa.gov.au)

Please check the address label on your publication. If it is incorrect or if you would like to be included on our mailing list, let us know!

#### Disclaimer

This material has been written for Western Australian conditions. Its availability does not imply suitability to other areas, and any interpretation or use is the responsibility of the user. Mention of product or trade names does not imply recommendation, and any omissions are unintentional. Recommendations were current at the time of preparation of the original publication.

# ***BEST PRAC FOR DRIED MEAT BAITS — GET THE MOST OUT OF YOUR BAITING PROGRAM***

*Callum McDonald, Biosecurity Officer, Kununurra*

## **Drying racks**

Drying racks are a very important part of the process for preparing good baits. Racks for drying baits should be made from wire netting stretched over a frame. The netting should be 25 mm mesh or smaller and stretched as tautly as possible over the frame. The smaller the mesh the easier it is to remove the dried baits and small bait does not fall through. The drying rack should be situated in the open to gain maximum sunlight and air circulation.

The racks should be of a convenient height (waist height) and width; the injector must be able to reach across comfortably (maximum of 1.2 m). An average rack will have the capacity for approximately 100 freshly cut (wet) baits per metre of length.

Having 200 x 200 mm form mesh as a support for the 25 mm mesh will stop sagging and give the injector a pattern to follow so they do not miss any baits. It is necessary to spread a second layer of netting over the drying baits to prevent birds such as crows removing them from the rack. Crows can pick up baits and drop them where they are not wanted. The selected site must be isolated from general access. As an added precaution, warning signs should be displayed prominently nearby.



*An example of a well-constructed drying rack*

## Cutting baits to size

When cutting baits, remember:

- Ragged edges, ripped connective tissue and deep cuts make ideal sites for blowflies to lay eggs.
- Bait with a major seam of loose connective tissue may fall apart when dropped from an aircraft.
- Smooth, even-sized baits are easier to handle, store and feed through the bait chute of an aircraft.
- Small, ragged or flat baits pose risks to native non-target animals (dog-size bite is best).
- Fat on bait can go rancid and the resultant stench makes handling baits unpleasant, especially in the confines of an aircraft.
- Fat is unable to absorb 1080 and prolongs the drying time of the underlying meat.
- To cut good baits, trim off ragged edges, fat and connective tissue.
- Cut baits from a single block of muscle, using strong decisive cuts.
- Cut baits 6 cm square and 4 cm thick.
- On average nine baits should weigh 1 kg wet.
- Be strict about the size and quality of baits and discard sub-standard and fly-blown baits.



*Evenly cut baits that have been injected and covered with netting*

## Placing baits on racks

Spread baits out evenly on the rack as soon as possible after cutting. Moist meat deteriorates rapidly when cut and sitting in a bucket, especially in hot weather. Do not allow baits to touch each other as this prevents uniform drying and provides a moist environment for blowflies to lay their eggs. Place baits on the wire netting and not on a solid surface. It is important that the baits dry as quickly as possible; generally leave for about two days. Dried baits should be dark coloured, hard on the outside and weigh only 40 per cent of their original weight.

Dried baits can still have a very slight give to them when pressed firmly but there should be a definite hard outer layer. It is essential that only hard, well-dried baits are used because:

- they pose less risk to small non-target animals
- there is less possibility of 1080 being leached out by rain
- they can better withstand weathering
- they will not rot before being laid
- they are less likely to go mouldy
- it will be more difficult for ants to eat through to the softer centres
- sand and other matter will not stick to dry baits.

Only prepare enough baits for immediate use and do not store baits for extended periods. Temporarily store dried baits in containers which allow air to circulate freely around them, such as onion bags. Baits must be labelled and stored in a locked room or shed. Do not store baits and foodstuffs together.

Contact your local DAFWA Biosecurity Officer for additional information.

## **WEEBO GOAT/MAREMMA TRIAL**

*Simon Kopke, Manager, Weebo station, Leinster*

An increase in wild dog numbers over the past decade has made it impossible to run any small stock in the Northern Goldfields. From a history of averaging 10 000 Merino sheep producing 21 micron wool, Weebo completed its last shearing in 2004 and has since destocked.

### **The trial began in 2010 and its purpose was:**

- To improve the commercial viability of Weebo station –
  - although financially supported by a mining company, there is an opportunity for Weebo to become self-supporting again.
- To trial the use of electric fencing to control rangeland goats and wild dogs in rangeland conditions –
  - not only to protect stock on Weebo but to provide possible solutions to other pastoralists and farmers also trying to protect livestock.
- To trial the use of Maremma guardian dogs to protect stock against wild dogs in rangeland conditions –
  - the Maremma dog has been used successfully in Italy for over 2000 years for the protection of livestock from predation by wolves and bears. Maremmas have also been used successfully to protect penguins and chooks.

The trial also looked at the potential to improve the genetics of a rangelands goat herd by the introduction of the Kalahari breed. The Kalahari breed was chosen because of their red pigment, which aids in camouflage against predators. They are also prolific breeders as well as good mothers; they have a larger, more marketable frame than the rangeland goat. The Kalahari kids are earlier maturing and have a high weaning survival rate.

**Objectives:**

- To produce a more marketable goat product suitable for the local restaurant chains, thus reducing reliance on export markets.
  - Nutritional information has shown that goat meat is lean and low in cholesterol, making it an increasingly popular product given today's nutritional standards.
- To identify a prospective industry in an area where wild dog predation has destroyed all small stock enterprises.
  - There have been expressions of interest in the results of this trial from other landholders in similar predicaments, suggesting a potential solution for the small stock industry as a whole.
- The possibility to use this project as a template for other landholders, or those with livestock.

**Procedures:**

Preparation and infrastructure:

- construction of goat yards, setting up paddocks with electric fences and ensuring water points were fully functional
- purchase 200 rangeland nannies, acquired locally. The four Kalahari bucks and the four Maremma dogs were purchased from Queensland and Victoria respectively
- bonding and training of both Maremma and goats then took place in purpose-built yards at the shearing shed. It was here where they were not only bonded to each other but also trained to respect electric fences. Maremmas were de-sexed at 6–8 months of age
- once successfully bonded, the four Maremmas were put into the trial paddock along with their goats. Two dogs were equipped with GPS tracking collars.

All procedures were done according to the book produced by the Invasive Species Cooperative Research Centre 'Guardian Dogs: Best Practice Manual for the use of Livestock Guardian Dogs'.

<http://www.invasiveanimals.com/wp-content/uploads/2010/09/Guardian-Dogs-web.pdf>

**Setbacks of the trial so far:**

- One of the Maremmas took to killing the young goats rather than protecting them. This dog was removed from the trial.
- In retrospect, I did not give the Maremmas enough time to bond to the trial paddock and when I released the goats from a central holding yard in the paddock they all walked to the bottom of the paddock. The Maremmas did not follow but wandered to the other end of the paddock.
- Two dingoes got in through the electric fence and killed six goats and chased another 40 through the electric fence and out of the paddock.
- Five feral billies got in, presumably attracted by receptive nannies. They impregnated quite a few, thus setting back the selective breeding process.
- It has proved difficult to rear the Kalahari kids through to weaning. Only 40% approximately are surviving to weaning age.
- Management is currently addressing the issue of the low kidding percentage; it is uncertain whether this is an animal health or nutrition issue or possibly wild dogs are killing the newly born kids soon after they are born. The nannies are a distance from the main mob of nannies when they kid.

**Success to this point:**

- After the initial setback, the goats along with two Maremmas have now settled down, with the Maremmas successfully bonded to the paddock and the goats. No adult nannies have been lost in the last 12 months.
  - Kalahari bucks were introduced to the nannies in September 2011 and they have remained there ever since. No outside feral bucks have been back.
- A wild dog has been living at the opposite end of the 8 km by 8 km trial paddock for 12 months. No adult goats have been lost despite the presence of this dog.
- Bought a pair of Maremmas from a Perth-based breeder specifically for breeding replacement guardian dogs. I have successfully bred, trained and bonded and sold five Maremma pups to farmers looking to protect their sheep. I have already had offers to buy Maremma pups when the next litter arrives.

## **GUARD DOG EXPERIENCES OF QUEENSLAND PASTORALISTS JIM AND ROD ALLPASS FROM BARCALDINE**

*Greg Brennan, DAFWA, Geraldton and Simon Kopke, Weebo station, Leinster*

Queensland vertebrate pest researcher Dr Lee Allan advises Queensland small stock producers that to survive dog predation with the current high wild dog populations they need to build a dog-proof fence or introduce guardian dogs, donkeys or llamas. Lee provided contacts for pastoralists in Queensland timbered country who were using Maremma guardian dogs with sheep. Jim Allpass runs Merino wethers only and he has used Maremmas to successfully control wild dog predations. Normally he would get 6–7% mortality, but with the influx of wild dogs it was 18–20%. The Maremmas have solved the problem with wethers but Jim's country is 80% cleared and planted to buffel grass. However, the wild dog population is increasing and Jim is not sure the Maremmas are going to be able to hold them off his sheep if this increase continues.

Jim's son Rod manages other properties in the district, running cattle and joining 9500 Merino ewes. He has about 28 Maremmas running with the sheep in timbered country.

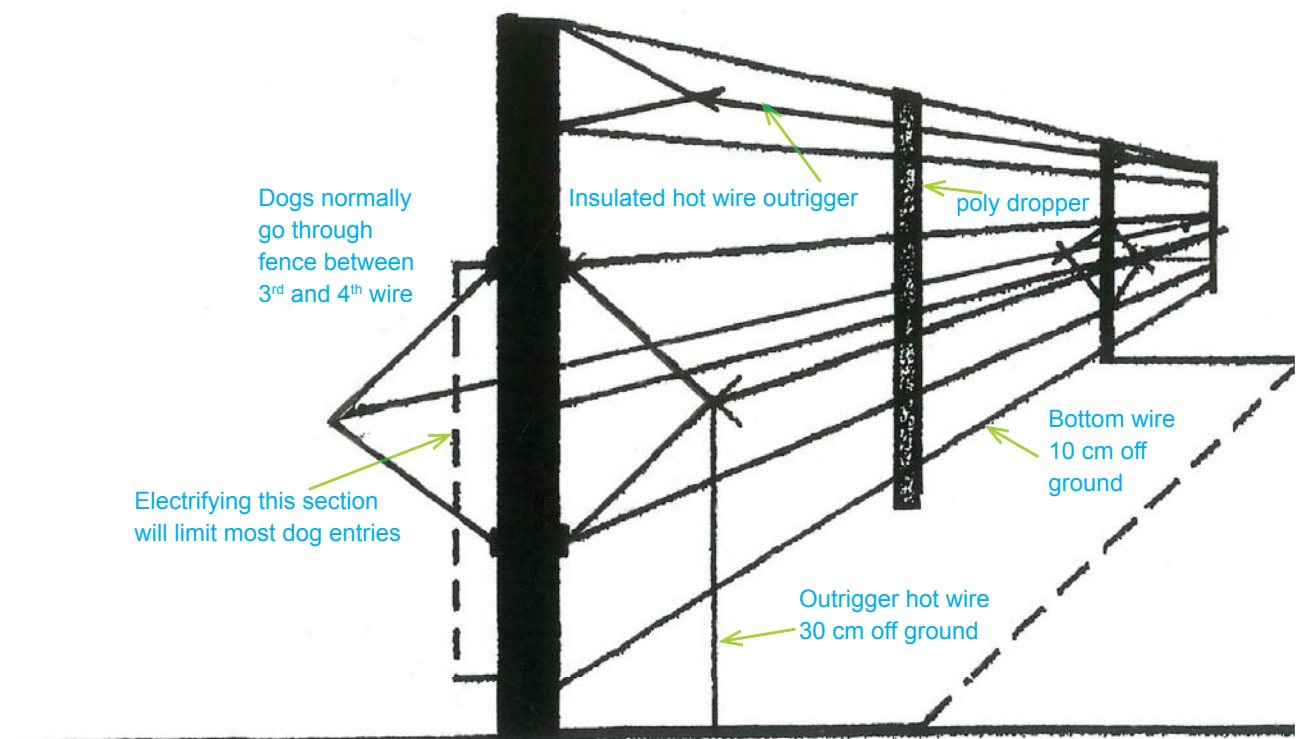
Rod reports that the guard dogs have stopped the losses in the adults (his mortalities have reduced substantially) but there has been no increase in his lambing percentage. Rod says the wild dogs are definitely affecting lambing percentages but he also has a major problem with eagles, foxes and wild pigs which are also taking lambs. Because of the Maremmas' presence, he can't trap or bait. They are having a brilliant run of seasons there so pigs, foxes, eagles and wild dogs are in big numbers.

It's not an easy job running Maremmas says Rod; it's a lot of extra work and extra expense. Buying pups and bonding them is not a small task as a special yard (usually electrified) is needed which is populated with different classes of sheep until the dogs are de-sexed at 6–8 months and put to work in the paddocks. Then there is the husbandry and the expense of feeding them in the paddock. Some Maremmas are failures in the paddock and these are best destroyed.

The Barcaldine district receives about 400 mm rainfall and there are large areas of Mitchell grass. Some landholders are erecting vermin proof boundary fences using manufactured fences costing about \$3800 per km just for the netting.

Bob and Neil Grinham in the Murchison have been experimenting at Meka station with electric fences for vermin proofing purposes. One design that is showing promise is a six or seven wire electric fence with an outrigger on both sides strung from the hot wires which are the 2<sup>nd</sup> and 4<sup>th</sup> wires off the ground. This positions the outrigger wire 30 cm off the ground. An additional insulated hot outrigger can be positioned on the outside from the top and second top wires to prevent jump-over. This configuration is designed to hold out livestock, goats, kangaroos and dogs. For high quality fence materials it costs \$2200 per km excluding the energizer. A powerful energizer is required for predator control as overseas research has shown that a much more powerful shock is needed to be delivered compared to that required for livestock control. A 25 Joule energizer can provide the necessary power and models are available that are powered by solar panels. Bob Grinham suggests that such an energizer would be adequate for about 18 km of fence.

Meka station vermin-proof fence. 6 high tensile plain wire fence with insulated hot wires 2<sup>nd</sup> and 4<sup>th</sup> from bottom. Fence 1.1 m high. Pickets spaced 20–22 m apart with polydroppers midway



Sketch of an electrified 6 plain wire fence to be constructed at Meka station, Yalgoo to control wild dogs

## ROLAND NICHOLLS – 30 YEARS OF SERVICE

The Broome office recently celebrated Roland Nicholls achieving 30 years of service with the department. Roland has had a long and varied career with the department, starting way back in 1981 when he worked on the Brucellosis and Tuberculosis Eradication Campaign (BTEC) in beef cattle in Merredin. Two years later he moved to Albany where he continued to work on BTEC, this time concentrating on dairy cows, and was also involved in research into sheep dermatitis and worm trials.

In 1985, Roland was transferred to Perth where his skills were put to use in a number of programs, including sheep and goat lice research, blowfly trials, cheesy gland research, ryegrass toxicity trials and research related to the ostrich and emu industries. In addition, Roland was involved in research relating to live sheep export and even took a cruise to the Middle East on a live export vessel, all in the line of duty.

Not content to confine his talents to sheep, goats, cows, ostriches and emus, Roland also worked in a number of research trials related to the pork industry. His work included tackling diseases such as atrophic rhinitis and pleurisy and working on eco shelters, environmental monitoring and piglet weaner lupin and enzyme trials.

In 2010 Roland transferred to the tropical Kimberley where he now predominantly deals with cattle. Based in Broome, he is kept busy with livestock inspection, compliance and welfare duties as well as his role in helping control invasive species, ranging from weeds to camels.



*John Ruprecht (Executive Director, Perth) presents Roland with a certificate recognising his 30 years of service to DAFWA.*

## PRODUCER TOUR – KATHERINE, NT

Anne Marie Huey, Broome

As a result of his involvement with the North Australian Beef Research Council (NABRC), Mike De Long instigated a producer tour to Katherine in the Northern Territory to see what is happening over the border. An invitation was extended to producers across the Kimberley and Pilbara, but unfortunately only Mike and Kurt Elezovich were able to make the trip. Nevertheless, the trip was extremely informative and both Mike and Kurt came home with a few new ideas.

The four-day trip started with a visit to the Berrimah Farm in Darwin, to talk to Arthur Cameron about improved pastures and what species may be beneficial to the Kimberley region. Arthur discussed the relative attributes of a range of species, including information such as rainfall and soil requirements. We then had a good look at some of the species growing in trial plots on the farm. Grasses we looked at included pangola, strickland, jarra para and Tully grass, as well as a couple of species of stylos. Arthur was very forthcoming with his advice as to how best to establish and maintain improved pastures.

Once in Katherine we headed out to the research station where the manager, Jack Wheeler, gave a working dog demonstration. Jack gave us the benefit of his experience in training both dogs and cattle, as well as some handy tips on how to get the most out of working dogs.

Still in Katherine, we attended a two-day 'Breeding for Fertility' workshop delivered by John Bertram and Wayne Upton. John and Wayne explained the value of using Estimated Breeding Values (EBVs) and Bull Breeding Soundness Evaluations (BBSEs) when selecting bulls. The success of the workshop was evident as established stud breeders who had previously discounted EBVs as not worth the trouble had converted their thinking by the end of the second day. More information about the workshop can be found later in this issue.

Following the fertility workshop, we sat in on a Katherine Primary Industries Advisory Committee (KPIAC) meeting, which has a similar function to the Kimberley Regional Beef Research Committee (KRBRC). The KPIAC chair, Keith Holzwart, gave a run-down on the most recent NABRC meeting and the NT Department of Resources (NT DoR) staff updated the committee on the status of current projects.

Keith also spoke about a group of like-minded producers from the Sturt Plateau who got together to form a group aimed at increasing production in the region. A summary of how the group operates and some of their achievements is described below.

Our final activity in Katherine was to look at the Senepol bulls and their Senepol-Brahman cross progeny currently being assessed in a cross-breeding trial conducted by NT DoR. Senepol are a tropically adapted *Bos taurus* breed and so far the cross-breeding results are promising. Progeny are typically heavier than straight Brahman and the majority of offspring are either polled or scurred. It is anticipated that Senepol cattle will be more palatable to the domestic market than high grade Brahman cattle, which may lead to greater marketing opportunities.



*Senepol bull used in cross-breeding trial,  
Katherine NT*



*Senepol–Brahman cross progeny*

All in all, it was an information-packed four-day trip that gave us all a lot to think about. The challenge now is to work out how to best implement the relevant practices to improve productivity in the Kimberley.

### **Sturt Plateau Best Practice Group**

The Sturt Plateau Best Practice Group was formed in 1994 by like-minded producers in order to assist one another to improve productivity on the plateau. In the early days it acted as a sort of support group as the plateau was largely undeveloped and something of an unknown quantity.

The group started by developing a Best Practice Manual which was the collective knowledge of producers at the time. The Best Practice Manual was revised in 2000 and it was interesting to note that significant changes as to what constituted 'best practice' had occurred in that time.

As the group progressed, a vision was developed in order to help guide activities. It was decided that anything that was going to help improve production on the plateau would be supported. The group is now a powerful presence within the NT beef industry and plays a significant role in defining research and extension activities in the Katherine region.

Some of the group's achievements to date are:

- An open and honest relationship between producers. *"We skite about our wins, but more importantly we also talk about our failures to help others avoid the pitfalls."*
- Improved road system – two new access roads were created as a direct result of lobbying by the group.
- A mail service was instigated where previously there was none.
- Contributed to the Water Enhancement Scheme funding for the NT.
- As part of Beef Plan funding the group participated in a subsidised trip to South-East Asia to look at destination markets.
- Bulk buying of station inputs such as fencing material, vaccines, etc., resulting in significant savings for members.
- Weed management (in cooperation with the local Landcare group).
- Corporate funding for guest speakers at field days, etc.
- Funding for courses including finance, grazing land management, benchmarking, nutrition, supplementation, bull selection and improved pasture trials.

Anyone interested in forming a similar group in the Kimberley should contact Anne Marie Huey at [Anne-marie.huey@agric.wa.gov.au](mailto:Anne-marie.huey@agric.wa.gov.au) or by phone on 0417 993 142.

## **BREEDING FOR FERTILITY – EBVs**

*Anne Marie Huey, Broome*

As part of the producer tour to Katherine we attended a Breeding for Fertility workshop, instigated by the Katherine Primary Industry Advisory Committee (KPIAC). The workshop took place over two days and was delivered by John Bertram and Wayne Upton from the Beef CRC, with additional input from Tim Schatz and Trisha Cowley from the NT Department of Resources (NT DoR).

The workshop highlighted the advances in genetic information that are available to producers and the importance of using objective measures, such as Estimated Breeding Values (EBVs), when buying bulls. When you consider the bulls you buy today will have a direct impact on your herd for the next 15 or so years, it makes sense to use all the information available when selecting.

An EBV is an estimate of an animal's genetic merit, half of which will be passed on to its progeny. While there is some variation between breeds, EBVs are currently available for a range of traits including growth, fertility and carcass traits. EBVs for Brahman include:

- birth weight
- 200, 400 and 600 day weight
- mature cow weight
- milk (the amount of growth in the calf that can be attributed to the mother)
- scrotal size
- days to calving
- carcass weight and retail beef yield
- eye muscle area, rib and rump fat
- shear force (tenderness)
- flight time (temperament).

Although traits vary in their heritability, targeting specific performance aspects can greatly improve herd productivity. For example, age at puberty of heifers is highly heritable and post-partum anoestrus interval (the ability to cycle while lactating) is moderately heritable. Selecting bulls that have the genetics to pass on these traits to their daughter will help improve fertility in your herd.

The two EBVs that relate directly to fertility are scrotal size and days to calving. Days to calving is a measure of how quickly a female will conceive in the mating period, and is therefore an important tool to select bulls that sire more productive females. Select sires with shorter, more negative days to calving EBVs. Scrotal size is related to age at puberty, with sires with larger scrotal sizes producing daughters that reach puberty at a younger age. Select sires with larger, more positive scrotal size EBVs.

While selecting bulls that score well in these areas will improve fertility in their daughters, it is important to note that heavily selecting for just one trait may result in poor performance in other areas, such as growth or even survivability. When selecting bulls it is critical to balance all the traits that are important to your operation.

To assist this, two Indexes have been developed. An index is an indicator of how profitable a bull's progeny will be for a specific production system. It takes into account the short-term profit by sale of progeny and the long-term profit generated by replacement heifers. It is calculated by weighting the EBVs for the relative economic traits for a specific purpose, for example Jap Ox. KPIAC identified a need for a Live Export Index which has now been developed. The Live Export Index allows for a quick and easy comparison of the genetic potential of bulls. However, always check the individual EBVs as well to make sure that the bulls chosen will best suit your breeding operation. More information on EBVs and Indexes can be found on the Breedplan website.

[http://breedplan.une.edu.au/index.php?option=com\\_content&task=view&id=13&Itemid=34](http://breedplan.une.edu.au/index.php?option=com_content&task=view&id=13&Itemid=34)

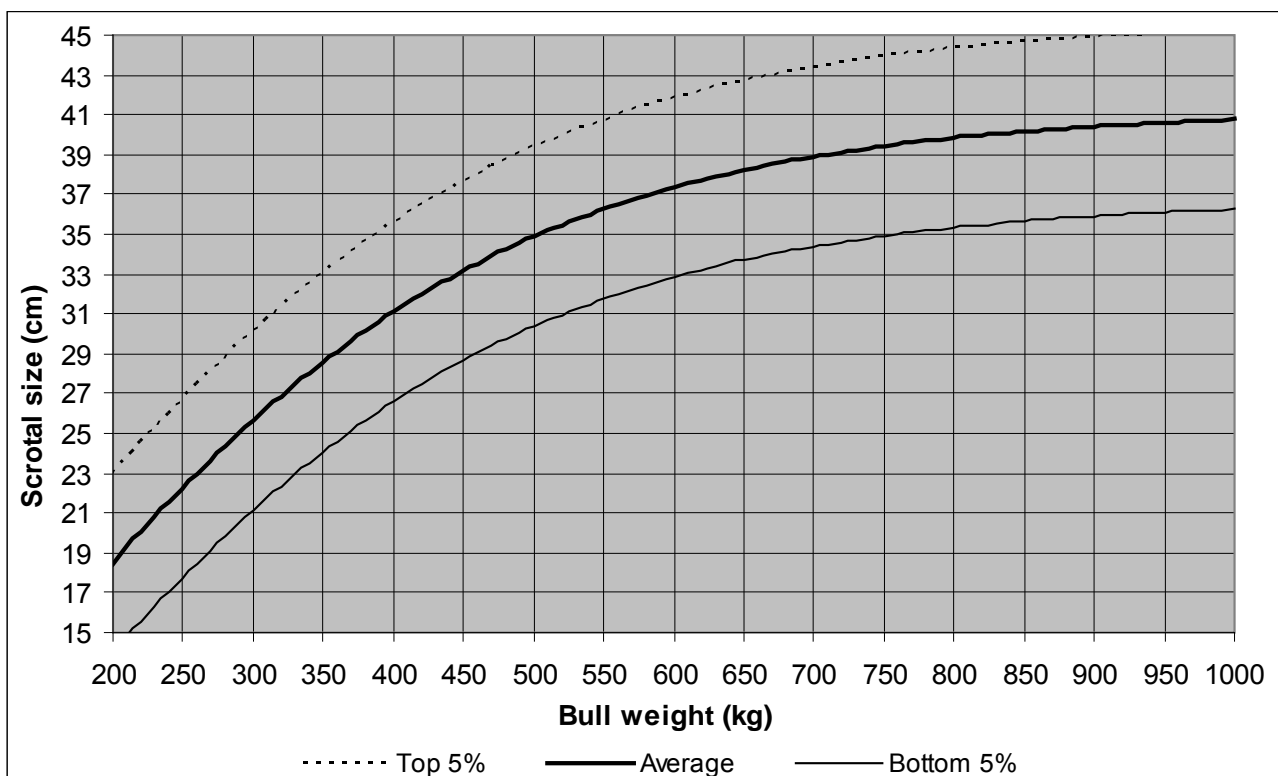
# WHO'S YA DADDY?

Anne Marie Huey, Broome

You've studied the sale catalogue and inspected the bulls but how do you know if they are going to deliver any calves once you get them home? Unfortunately, a bull's ability to deliver calves is not something that can be determined by a simple visual inspection. In a recent study of 245 bulls it was found that 7% sired no calves, 58% sired approximately 10% of calves and 13% sired more than 30% of calves.

There are many factors that influence a bull's ability to sire calves, including sheath structure, scrotal circumference, umbilical thickness, semen quality, libido, age, structural soundness (i.e. will he be able to cover the country required and not break down at a young age?) and so on. That's a lot to consider!! Luckily, the Bull Breeding Soundness Evaluation (BBSE) has been designed to do just that. So the best way to determine how effective your bull may be is to insist on a BBSE before purchase. It is usually conducted by qualified veterinarians and is a physical examination of a bull to ensure he is capable of siring calves. A BBSE includes structural characteristics, serving ability and semen analysis.

The structural examination takes into account the general conformation of the bull to ensure he is physically capable of siring a calf. This includes factors such as four legs and two eyes, but also takes into account sheath characteristics, examination of the testes and measurement of scrotal size. For example, it has been shown that thicker, deeper sheaths are often related to bulls that sire fewer calves. Scrotal size is also directly related to fertility and should be average or above relative to their weight – refer to the graph below.



Serving ability is used to determine a bull's libido and considers factors such as interest, mounts and successful serves of a cycling cow.

Semen analysis is conducted in two stages, at the crush side to determine % motile and % progressively motile and in the laboratory to determine sperm morphology and live:dead ratio. These factors combine to give a % normal sperm rating. A fertile bull should achieve a % normal sperm rating of at least 70%, but the higher the better. In fact, studies have also shown that bulls that have high % normal sperm ratings at 24 months of age have daughters that have a younger age at puberty and return to cycling sooner after their first calf.

Semen characteristics can be affected by stress, such as long-distance transport, so it is best to request the BBSE is conducted before the bull arrives at the sale. Factors such as disease can also have a negative impact on semen quality, sometimes permanently, so it is a good idea to conduct a further BBSE mid-way through a bull's life to ensure he is still capable of getting the job done. After all, there is no point having the best genetics in the country if those genetics cannot be delivered to your calves.

## **SELECTING MORE PRODUCTIVE REPLACEMENT FEMALES**

*Peter Smith – Karratha/Charters Towers, Qld*

---

Pregnancy testing and recording the lactation status of first mated females around July/August each year is a very useful tool to improve breeder herd productivity. For example, 2010 weaned females should be tested in July/August this year, 2012.

Culling all females in this age group that are not pregnant or lactating will ensure that only more productive replacement females are selected as herd replacements. Heifers that reach puberty and have conceived by the time they are ~ 2 years of age are also more likely to conceive again while lactating and produce more calves in their lifetime in the breeder herd.

The issue of unsatisfactory pregnancy rates in first mated heifers seems to be becoming more common across northern Australia. A number of cattle producers in the Charters Towers area of north Queensland, with good cattle control, have reported disappointing pregnancy rates of heifers mated for the first time. Heifers have invariably been in good condition (BCS 3.5 – 4) and weighing 350–400 kg at the time of pregnancy testing. In at least one case less than 20% of heifers in this condition and liveweight were pregnant.

These reports highlight the need to ensure that the majority of first mated herd replacement heifers have already reached puberty at the commencement of planned mating. Age and weight at puberty is influenced by a number of factors including genetics, time of year that they were born and growth from weaning until the first growing season following weaning.

Research from the Beef CRC and other projects has confirmed that **average liveweight** at puberty of *Bos indicus* heifers is around 65% of average mature cow weight for that herd. Mature cow weight is defined as a 5 year old dry cow in moderate condition (BCS 3 – 3.5). In at least some of the cases reported in the Charters Towers district it is suspected that increasing mature cow size is a major contributing factor to an apparent increase in heifer weight at puberty. If the average liveweight of mature cows in a herd in BCS 3 – 3.5 is say 500 kg, the average liveweight of heifers at puberty in that herd will be around 325 kg. In another herd with mature cow weights of say 540 kg, average weight at puberty will increase to around 350 kg.

There is a broad range of liveweight at puberty and while the average liveweight might be 325 kg as in this example, only around half of the heifers may have reached puberty and commenced to cycle at this average weight. Table 1 below, adapted from a Beef CRC publication, demonstrates the wide range in weight and age of Brahman and Tropical composite heifers at puberty.

Table 1 Age and weight at puberty of *Bos indicus* and Tropical composite heifers

Trait	Brahman (range)	Tropical composites (range)
Age at puberty (months)	25 (13 – 40)	22 (11– 31)
Weight at puberty (kg)	334 (196 – 485)	330 (206 – 474)

The range in weight and age at puberty explains the comment about ‘lovely big heifers’ that may be 3 years of age and not yet reached puberty while females of the same age may have already weaned a calf and are pregnant again. These heifers probably don’t look too ‘lovely’ – they have been too busy working!

**The good news** is that age and weight at puberty is reasonably highly heritable, so selection of heifers that conceive when first mated as 2 year olds, i.e. 2010 weaned heifers tested pregnant in 2012, will improve pregnancy rates of heifers in future generations.

Age and weight at puberty is also positively associated with ‘days to calving’ which is in effect a measure of the ability of females to cycle and conceive again while lactating.

**The bad news** is that the reverse is also true, i.e. failing to cull heifers that do not conceive as 2 year olds from the herd will perpetuate the problem of poor pregnancy rates in first mated heifers and poor conception rates in lactating females.

A suggested practice for Pilbara and Kimberley herds where bull control is often a problem is to pregnancy test all young females in the second year following weaning and cull all that are not lactating or pregnant. Foetal aging during pregnancy testing will allow the calving period of these young females to be further restricted or possibly drafting late calving females into a separate group to allow preferential management as required when they are lactating during the following dry season. Dry empty heifers at this time will be 400 kg + in most areas and depending on market opportunities, quite saleable.

## Bull selection

Beef CRC research has confirmed that bulls can be selected for traits that have a positive effect on age of puberty of heifers and days to calving. Scrotal circumference is not only an indication of sperm production by bulls but also age at puberty of heifer progeny. Percent normal sperm produced by 2 year old bulls is strongly associated with improving conception rates in young lactating females.

Genetic progress by selection for traits expressed by females, e.g. as related to age and weight at puberty and days to calving as discussed above, while positive, is slow as females only produce around 5–6 calves in their lifetime and only half of these will be female. Bulls, on the other hand, may produce up to 30–40 calves each year during their working life of 4–5 years or 60–100 females.

It is one thing for bulls to have the genetic potential to improve, in this case fertility traits in a herd, but it is another matter altogether determining if they are likely to deliver the genetics. Bull breeding soundness evaluation (BBSE), which should include an assessment of % normal sperm and scrotal circumference measurement, is a simple and inexpensive indicator of the likely ‘calf getting’ ability of a bull. It is strongly recommended that BBSEs be conducted on all purchased bulls as a condition of sale and all home bred bulls at final selection. Research confirms that around 15% of bulls are identified as ‘sub fertile’ at initial evaluation.

## Management

Genetic improvement for the traits discussed will only be realised if environmental factors like disease control, nutrition and management allow. For example:

- If stocking rate exceeds carrying capacity, cattle will not have the opportunity to express their genetic potential as nutrition will be limiting.
- Research has demonstrated that heifers that continue to gain some weight following weaning until the first growing season following weaning, will reach puberty younger and at a lighter weight.
- If the practice of culling all heifers that fail to conceive by 2 years of age can be adopted, more heifers than required as replacements (overmating) should be introduced. This may require some 'lesser' heifers being mated but replacement breeders will be selected on fertility traits and be more productive during their lifetime. After all, that is what they are there for!
- While overmating may be an option, obvious culls, e.g. heifers with poor temperament, physical defects and younger smaller heifers, should not be mated. Spaying may be an option for these heifers.
- Managing pregnant first mated females so that they calve in BCS 3 or better will increase conceptions while lactating.



*Good conception rates could be expected from heifers in this condition at the commencement of mating.*



*Expect good conception rates from first lactation females in this condition.*

## Summary

The reproductive performance of first mated and first lactation females can be improved over time using simple and practical selection tools. Pregnancy testing and foetal ageing of first mated females will identify 'sub fertile' females. Selecting bulls with traits that will produce more productive female progeny will achieve more progress due to the number of calves sired.

While genetic change is permanent and cumulative it cannot be demonstrated if grazing and cattle management is not on the right track.

## Further reading

'Heifer management in northern beef herds' – MLA publication  
Beef CRC legacy fact sheets – [www.beefcrc.com](http://www.beefcrc.com)

# WET SEASON PHOSPHORUS – START DOING THE NUMBERS NOW

*Matthew Fletcher and FutureBeef team*

Much of the cattle country of northern Australia has marginal to low soil phosphorus (P) levels. In these areas P is most likely to be the nutrient limiting cattle performance during the growing season when protein, energy and other minerals are usually adequate. Effectively supplementing cattle grazing these areas with P during the growing season can increase growth rates by 20–70 kg and pregnancy rates by 15–20% (Table 1).

Table 1 Effect from phosphorus supplements – data from experimental work across northern Australia

Soil phosphorus	2 ppm (acute)	4 ppm (deficient)	8 ppm (marginal)
Liveweight gain/year <b>no</b> supplement (kg)	22	101	156
Liveweight gain/year <b>plus</b> supplement (kg)	94	154	171
Liveweight advantage (kg)	72	53	15

Soil phosphorus	2 ppm (acute)	8 ppm (marginal)
Branding rates - no phosphorus supplement to breeders	50	65
Branding rates - breeders with phosphorus supplement	65	70

Now is an ideal time to start planning the use of wet season phosphorus over the 2012/13 wet season. Stations have completed their first round of mustering, counted the number of calves branded and pregnancy testing has begun – producers by now have a good idea of how productive their herd is.

**The wet season is the cheapest time to put weight on cattle because all other nutrients are in the green grass—for free.**

Keeping simple records of branding rates, death rates and annual liveweight gains will provide the information to measure the cost/benefit of introducing a wet season phosphorus program. Responses to P supplements are generally assured on areas that are recognised as P deficient, for example, coastal pindan. On areas where the P status is unknown or suspect, further investigation is required to determine the likely benefit of wet season P supplementation. Just tossing out a few tonne of wet season phosphorus can be a real waste of money.

On most properties it is very difficult to get a handle on soil phosphorus levels across large breeder paddocks. Soils maps provide a guide but the most reliable method of determining the P status of cattle and likely responses to supplements is blood sampling of dry growing cattle during the late wet season and faecal sampling of lactating breeders during the wet. (Often easier said than done.) These faecal samples should be submitted for NIRS diet quality determinations and also analyses for faecal P. Interpretation of these results will indicate likely responses to P supplementation and target supplement P intake.

Managers need to know approximately how much P their cattle need to eat each day and monitor their intakes. If intake is too low cattle response will be limited and if too high it will be unnecessarily expensive for no additional benefit. Supplements can usually be altered to improve or reduce intake. It is difficult to fine tune supplement intakes to optimise P response and reduce supplementation costs (wet and dry season) where herds calve all year round, as is the case with many northern breeding operations.

Unfortunately 'one size does not fit all' when it comes to animal intakes of P supplements. Intakes can vary enormously between paddocks and even water sources (bore or dam) can influence lick consumption. Take the opportunity to monitor intakes this wet season and use this information to adjust feeding programs in following seasons. Monitoring and recording intakes (supplement fed out to estimated numbers in different areas) will enable a close eye to be kept on supplement costs per head.

Many areas in north Australia have access problems during the wet season. Due to the significant potential benefit of feeding P during the wet, it is suggested that it is well worth putting some serious thought into how supplement might be supplied for long periods when access may be difficult/impossible. The first step is to establish which lick gives a satisfactory intake and then provide enough supplement for the breeders for 3 to 4 months. How this is achieved is limited only by the imagination of pastoralists and their desire to 'make it happen'. Examples include sheds over large troughs, central feed storage locations (sea containers are good) that may be accessible by say 4 wheeler to allow



*Simple covered trough—good when lick can be fed regularly*



*Blocks can be fed out late dry season to last the wet*



*Cattle behaviour can be a useful indicator of P deficiency*

periodical feeding out of lick, using half-tonne bags of loose lick which includes 8–10% ground limestone in the mix (experience indicates that these mixes will ‘crust’ during rain thus reducing spoilage), using weather resistant blocks, etc.

### Why feed phosphorus

Some soil types in north Australia provide adequate levels of phosphorus but a large proportion are phosphorus deficient. Cattle get phosphorus from pasture; pasture species source phosphorus from the soil. Therefore cattle will be deficient on low phosphorus soils. Phosphorus supplements in the wet season are still the most cost-effective supplement strategy available to northern beef producers on deficient country. Phosphorus is needed to convert feed into energy and is critical for skeletal growth, developing foetuses and milk production. It has been proven over many years that inadequate phosphorus reduces growth and branding rates.

Cattle respond to P supplementation by increasing their feed intake thus increasing their growth, milk production and general well-being. If there is inadequate feed, stocking rate exceeds carrying capacity, animals will not be able to respond to supplements.

**“If stocking rate is not ‘right’ forget the rest.”** (Anon. 2012).

Look for the Meat and Livestock Australia publication ‘**Feeding phosphorus to beef cattle in northern Australia**’.

## FUTUREBEEF

**What is FutureBeef?** – an exciting partnership of four organisations working together for profitable and sustainable northern beef production.

**Who is involved?** – Department of Agriculture and Food WA, Department of Resources NT, Department of Agriculture, Fisheries and Forestry QLD and Meat and Livestock Australia.

**What FutureBeef has to offer?** – a one-stop-shop for beef information across northern Australia.

**Unparalleled resource base** – looking for a publication on heifer management in northern beef herds, fire management guidelines for southern shrubland and Pilbara or information about buying bulls – FutureBeef has it all.

**FutureBeef ebulletin** – sign up and receive the free FutureBeef ebulletin to keep in touch with what is happening in the North Australian Pastoral Industry (recommended). FutureBeef ebulletins feature the latest in research and development updates, news and views, and workshops and industry events. Register at: <http://futurebeef.com.au/register>

### Editor’s recommendation:

1. Navigate to the FutureBeef website <http://futurebeef.com.au/> .
2. Add to favourites list.
3. Have a surf around (search a current topic relevant to your business, e.g. nutrition).
4. Subscribe to the FutureBeef ebulletin.

If you have any difficulties or would like to discuss, please call Matthew Fletcher on 9166 4019 or email [matthew.fletcher@agric.wa.gov.au](mailto:matthew.fletcher@agric.wa.gov.au)



## How to reduce inspection costs

### *Notify prior to departure and arrival*

- Notify the inspector at the Entry Inspection Post at least 3 days in advance of estimated arrival and inspection times.

### *Avoid the penalty inspection rates*

- Avoid scheduling inspections on weekends or public holidays.
- Avoid scheduling inspections to begin prior to 6.00 am or to continue after 6.00 pm.

### *At the Entry Inspection Point*

- Ensure all entry documentation is complete and legible including full details of ownership and address of the properties of origin and destination.

### *On your property*

- Have stock yarded and ready for inspection before the inspector arrives.
- Have adequate staff to ensure a constant flow of animals during inspection.

### *Private Veterinary Practitioners*

- Private veterinarians treat and collect samples for liver fluke testing for horses, camelids and deer and it is preferred they do so for other species. However, if this is not possible, treatment may be supervised by a stock inspector and they may also collect the faecal sample.
- Ensure all documentation declaring the completion of all prescribed treatments, tests and inspections is complete.

## Further Information

Contact your local Stock Inspector or Biosecurity Officer

District Office	Phone
Albany	08 9892 8444
Bunbury	08 9780 6100
Broome	0404 819 626
Esperance	08 9083 1111
Geraldton	08 9956 8555
Kalgoorlie	08 9088 6033
Katanning	08 9821 3333
Manjimup	08 9777 0000
Merredin	08 9081 3111
Metropolitan	08 9368 3370
Moora	08 9651 1302
Narrogin	08 9881 0222
Northam	08 9690 2000
Waroon	08 9733 7712

### Entry Inspection Posts

Kununurra	08 9169 1399
Kalgoorlie	0417 957 234
Airport	08 9334 1800

### Finance Queries

South Perth	08 9368 3333
-------------	--------------

### Inspector in Charge (Stock)

South Perth	08 9368 3370
-------------	--------------



Department of  
Agriculture and Food



# SERVICE FEES AND CHARGES FOR LIVESTOCK INSPECTIONS 2012/13

## Why charge for inspections?

- So tax-payers (public) money is not used to subsidise inspection services for livestock importers.
- To enable an all-year-round, on-call service at the Entry Inspection Points.
- To maintain the quarantine inspection facilities at Kalgoorlie and Kununurra.
- There will always be a small risk of live animals introducing disease so consider importing semen or embryos instead.

### The Animal Health Laboratory charge for the Faecal Egg Test for liver fluke eggs is:

	Unit Fee	GST	Total Fee
Case fee	9.91	0.99	10.90
Each sample in consignment	78.64	7.86	86.50

NB. These tests are also conducted by approved private laboratories (e.g. Vet Path).

## Guidelines for charging

1. The service fee for a shipment covers pre-entry preparation and communication costs and is shared between consignments.
2. The service fee for a consignment covers provision of the Health Certificate and release from post-entry surveillance quarantine and applies to each consignment both at the border and on-farm.
3. Inspection is charged per 15 minutes or part thereof for an inspector's time conducting inspection, supervision, sample collection and packaging, freighting and associated post inspection paperwork and communications.
4. Normal working hours are between 6.00 am to 6.00 pm on weekdays.
5. Penalty rates apply for inspections before 6.00 am or after 6.00 pm and on weekends and public holidays. There is a minimum charge for 'call out' on a weekend or public holiday.
6. A travel charge applies one-way for each 25 km or part thereof directly between the place of inspection and the nearest Department of Agriculture and Food office from which the inspection is normally provided. Penalty rates apply for travel outside of normal hours.
7. The travel charge to an Entry Inspection Point is one unit of 25 km for each journey to be shared between consignments in a shipment.
8. Inspection of washed-down vehicles attracts a time-based inspection fee and, if requiring a separate journey, a travel charge.
9. There is a fee for issuing Export Health Certificates and for issuing a Release from Import Surveillance Quarantine when not associated with a property visit.
10. \*Prices are GST inclusive where applicable. GST is not charged for inspections or treatments required under regulation.

Description of service	Fee \$
Service fee for a Shipment (shared) *	71.00
Service fee for a Consignment - Border *	38.25
Service fee for a Consignment - Post-Border *	40.75
Inspection 6am to 6pm - per 15 min or part thereof	45.75
Travel - per 25 km or part thereof	45.75
Inspection < 6am > 6pm - per 15 min or part thereof	58.00
Travel out of hours - per 25 km or part thereof	58.00
<b>Inspection weekends or public holidays</b>	
Inspection (minimum fee)	600.00
Inspection - per 15 minutes or part thereof	69.00
Travel weekends/public holiday- per 25 km or part thereof	69.00
<b>Vehicle wash down - Kununurra</b>	
Small trailers and vehicles *	27.25
Trucks (per deck) *	38.25
Machinery (per 30 min or part thereof) *	43.50
<b>Vehicle wash down - Other Inspection Points</b>	
Small trailers and vehicles *	32.75
Trucks (per deck) *	60.00
Machinery (per 30 min or part thereof) *	87.00
<b>Yard fees</b>	
Horses per head per day *	12.00
Sheep, cattle and other species per head per day *	3.25
<b>Document verification - not associated with a property visit</b>	
Export & Interstate Health Certificates	45.75
Surveillance Quarantine Release Notice	45.75
<b>Dip or spray for cattle tick *</b>	
Per animal treated *	2.75
Minimum fee *	25.00
<b>Medicine supply</b>	
Minimum fee	27.00
< 35 kg	0.75
36 - 100 kg	2.25
101 - 300 kg	5.00
301 - 600 kg	10.10
> 600 kg	12.90
<b>Carcass disposal (plus time for removal and burial) *</b>	
Large animals (per animal, cattle, buffalo, camelids) *	136.00
Small animals (per animal, sheep, goat, pig) *	49.25

# **BOVINE JOHNE'S DISEASE (BJD) – WHY WE NEED TO KEEP LOOKING**

*Dr Anna Erickson, Veterinary Officer, Narrogin*

You are probably familiar with ovine Johne's disease, a chronic wasting disease of sheep, because it is increasing in prevalence (some areas south of Perth now have more than 10% of flocks infected). However, there is also a cattle strain of the same bacteria which causes bovine Johne's disease (BJD) with similar symptoms: persistent scouring, weight loss and death of mature cattle despite good nutrition and worm control. There is no treatment for BJD.

While cattle become infected as young animals it is not until they are three or more years old that they develop clinical signs of disease.

The diarrhoea caused by BJD has a characteristic watery green appearance and foul smell. The appetite remains normal although infected cattle may be more thirsty than usual. There is no fever.

Once cattle start to scour or visibly lose weight, they deteriorate to become weak and emaciated. Infected animals die from a few weeks to several months after the onset of signs. Stressful events such as calving, producing milk, a lack of feed or poor feed may cause infected cattle to start showing signs of BJD.

BJD is widespread in almost all countries of the world which have cattle. Australia has a low prevalence of BJD except in the south-eastern dairy herd. WA is unique among the states in having BJD Free Zone status.

Bovine Johne's disease is a significant cost to the cattle industry. In 1996 BJD was estimated to cost the Victorian beef and dairy industries \$7.5 million per year. In addition, the BJD Free Zone status helps WA producers when exporting cattle to countries which have started BJD eradication programs. These countries often require proof of freedom from Johne's disease on the exporting property. The WA cattle industry is committed to maintaining WA's BJD Free Zone status.

To be recognised as a BJD Free Zone we must be able to demonstrate that we have looked for the disease and not found it.

Cattle Council of Australia provides a rebate to producers with cattle over three years of age that are scouring and wasting, to have them investigated by a veterinarian. A rebate of \$200 per investigation, plus \$150 for a post-mortem, is paid to producers. Tests to establish the cause of the illness costing up to \$2000 are paid from your contributions to the Industry Funding Scheme (Cattle). Your vet will also be able to claim a rebate to help cover travel expenses.

The likelihood of BJD in your herd is extremely low as there have been strict movement controls on cattle coming into the state for nearly 20 years. The last case of BJD in cattle was in 2006, and prior to that in 1992, and each was linked to imported cattle.

In the unlikely case of BJD being present in WA, the earlier it is detected, the lower the cost to your Industry Funding Scheme (Cattle) to eradicate it. The WA cattle industry remains committed to eradication of BJD.

Contact your private or district veterinarian for more details or go to [www.agric.wa.gov.au](http://www.agric.wa.gov.au) and search for 'Bovine Johne's Disease'. You can also contact me on 9881 0211.

Anna Erickson, WA State JD coordinator

# LAMBOO STATION, NEW YARDS — NEW ERA

Russell Shaw, Broome

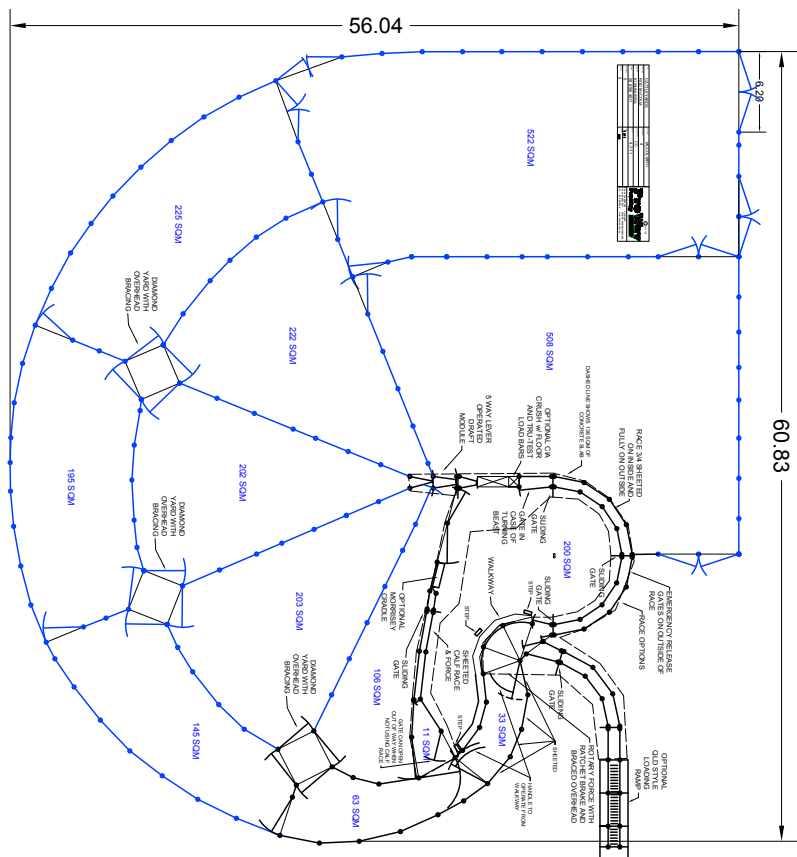
With significant support from the Indigenous Land Corporation the Ngunjiwirri Aboriginal Corporation (owners of Lamboo station, Halls Creek) have commissioned a set of cattle yards that are ‘cutting edge design’ on Lamboo station. The yards are modelled on a Temple Grandin design with modifications determined by Robin Yeeda (Lamboo station Manager) and Rod McColm (Kimberley Indigenous Management Support Service), Kununurra.

Lamboo station staff wasted no time and built the yards in about five weeks with the initial layout provided by a Pro Way supervisor. Features of the newly built yards include concreted and covered working areas, crush mounted scales and a closed in circular draft. The new yards can be comfortably worked with four staff and cattle can be easily worked from outside the forcing pen, minimising the need for staff to be in with cattle.

The yards recently processed their first mob of 800 head. Everyone involved in the work (including sceptics) were impressed with how easy the yards worked for both cattle and stockmen. The cattle moved easily through the yards with almost no ‘jamming’ or turning around and getting stuck. A job that took up to 4 to 5 days in the old yards was completed with ease in two days, getting cows and calves back into the paddock in a much shorter time period. Compared to the older set of yards where Robin only had a two-way draft and constantly had to run mobs of cattle back through to redraft into lines, he can now draft five ways with ease in a single draft.

Quick, efficient drafting of sale animals only once, rather than spending days being yarded and processed several times as required in the old yards, means that stock are being presented to buyers in much better condition.

Planned for later in the year is the completion of the sprinkler system, holding paddocks and laneways from water points in outlying paddocks leading directly to the yards.



The ‘final’ design of the Lamboo yards as submitted to Pro Way  
 Note: During layout and construction the yard design was modified to suit the ground conditions, particularly the approach and release of cattle from the yards and transport access at the site.



Robin Yeeda and Rod McColm standing outside the finished product

# ***BIG IN-ROADS FOR PRICKLY ACACIA CONTROL – ON TRACK FOR ERADICATION IN WESTERN AUSTRALIA***

Prickly acacia (*Acacia nilotica*) is a small, thorny shrub typically growing to 5 m; not to be confused with the similar looking mimosa bush (*Vachellia farnesiana*) which has the same yellow, ball-shaped flower but has a shorter seed pod with no constrictions between seeds.

The discovery of prickly acacia at Nulla Nulla and along reaches of the Durack River in 2004, were some of the first recordings of this Weed of National Significance (WONS) in Western Australia. The others, a single plant on the Duncan Highway and one in quarantine holding yards in Kununurra, were also documented in the same year, and have since been treated with no more occurrences recorded.

Covering an area of 7000 hectares, the Nulla Nulla and Durack River infestations are thought to have established around 25 years ago with its mode of transport unknown. Historically prickly acacia was introduced into Queensland in the 1890s as a shade and fodder plant, and since then has spread through the northern Mitchell Grass Downs by cattle, forming dense thickets.

The impacts on natural and productive areas include:

- dense thorny thickets are formed which hamper mustering, movement of stock and stock access to water
- decreases the availability of pastures and out-competes other flora for water
- facilitates erosion
- impacts on natural grasslands and alters biodiversity through a change to thorny woodlands.

The initial control program for prickly acacia infestations was fragmented due to limited funding and competition in gaining grants. However, since the 2010/11 wet season, ongoing treatment by Ord Land and Water (OLW), in partnership with the Kimberley Rangelands Biosecurity Association, has had a dramatic impact on weed density by decreasing the number of mature seed-bearing plants, and hence germinations. The majority of treatment has utilised aerial methods as access to the site is limited from Wyndham. The area treated in the 2011/12 wet season was over 7000 hectares, and a further 2000 hectares was also surveyed. These efforts have seen a one-third reduction in plants going into the 2011/12 wet season compared to the previous season, with a reduction in density of both germinations and mature plants.

Significant recovery in the Riparian zone can be seen along the Durack River reaches where thick stands of prickly acacia have been replaced by Eucalyptus species (Figures 1 and 2).

## **Follow-up treatment for 2012 dry season:**

- Working in with Balangarra Rangers for on-ground survey and control.
- Survey area for any mature plants missed in the early wet season, and treat through basal bark application of herbicide.

The National Weeds Strategy has identified a 2015 eradication target for prickly acacia in Western Australia, and the work being undertaken has been made possible with financial support from Rangelands NRM through the Caring for Our Country program. The project work will continue through to 2013, with further funding hopefully available to achieve this target. The best way to

remain vigilant against the spread of prickly acacia is through checks of transported cattle and associated agricultural machinery, which are the biggest risk factors for spread.

For further Information contact Dick Pasfield, Project Coordinator, Ord Land and Water, [dick@olw.com](mailto:dick@olw.com) (08) 9169 2222.



Figure 1 Durack River Reach in August 2004, heavily infested with a dense spread of prickly acacia and rubber bush (indicated by arrows)



Figure 2 The same reach of the Durack River in December 2011, with sandy area once dominated by prickly acacia now supporting Eucalyptus species

## **MESQUITE – TACKLING A PRICKLY PROBLEM IN CARNARVON**

On Monday 28 May the Department of Agriculture and Food (DAFWA) hosted a meeting of community stakeholders at the Carnarvon Research Station to discuss the management of the declared weed mesquite in the Gascoyne.

Mesquite is a fast-growing, weedy, thorny shrub native to South America that is capable of forming impenetrable thickets in arid and semi-arid regions. The largest mesquite infestation in Australia is in the Pilbara on Mardie station. It has spread to form an impenetrable thicket covering 60 000 hectares with scattered trees occurring over another 100 000 hectares. There are several other infestations in the state from the Kimberley to the Murchison along the state's waterways and floodplains.

The meeting was attended by stakeholders who are significant landholders within the Shire of Carnarvon and included Main Roads Western Australia, Department of Environment and Conservation (DEC), the Carnarvon Rangelands Biosecurity Association (CRBA) and the Shire of Carnarvon.

The meeting heard from Linda Anderson, who is the project manager for the Pilbara Mesquite Management Committee (PMMC), who has a successful model already in place for the management of large declared prickly trees in the Pilbara.

Funding opportunities are being developed for the control of mesquite in the Gascoyne as part of an Invasive Species strategy for the rangeland.



*Jim Miller (DAFWA) with a mesquite tree at the mouth of the Gascoyne River, Carnarvon*

---

## **BIOSECURITY INDUSTRY FUNDING SCHEMES FOR 2012–13**

---

Industry Funding Schemes (which came into effect in 2010 under the *Biosecurity and Agriculture Management Act 2007*) aim to help industry fight biosecurity threats that impact their sector but are not covered under national arrangements. There are currently three Schemes in operation. Each Scheme is managed by industry via Industry Management Committees.

The **Cattle Industry Funding Scheme** operates across all of Western Australia. The Scheme enables the WA cattle industry to identify pest and disease priorities at a whole-of-industry level, and then raise funds to address these biosecurity threats.

For the 2012/13 financial year, producers will pay a 20 cent per head/carcasses contribution on the sale of WA-produced cattle to fund surveillance programs for bovine tuberculosis (BTB), bovine Johne's disease (BJD) and enzootic bovine leucosis (EBL).

Stock agents and processors are required to collect and forward contributions on behalf of producers. The owner of any animal sold other than to a processor or via a stock agent will be responsible to pay the required contributions direct to the Industry Funding Scheme/Director General of DAFWA.

The other two Schemes in operation—the **Sheep and Goats Industry Funding Scheme** and the **Grains, Seeds and Hay Industry Funding Scheme**—currently operate only in the South West Land Division.

For the Sheep and Goats IFS, producers pay a 12 cent contribution on sheep and goats/ carcasses to fund a program to control virulent footrot. For the Grains, Seeds & Hay IFS; a 30 cent contribution on first sale of every tonne of grain and seed, and a 15 cent per tonne contribution on the first sale of hay is collected to fund continuing programs for the control of skeleton weed and the eradication of three-horned bedstraw. These contributions are only payable on produce grown in the South West Land Division.

To find out more, go to the Industry Funding Scheme page of the website: [www.biosecurity.wa.gov.au/IFS](http://www.biosecurity.wa.gov.au/IFS) or contact Cathy Lyons on (08) 9368 3942.

# **NUTRITIONAL ENERGY PRODUCTION AND LANDSCAPE FUNCTION IN THE SOUTHERN RANGELANDS**

*Jim Addison, Kalgoorlie*

---

Perennial grasses form a major source of ongoing nutritional energy, driving livestock reproduction and growth. A prerequisite to energy production is the availability of **soil moisture** (and associated nutrients) for perennial grass establishment, maintenance and growth. That is, maximising the time that root zone soil moisture is between field capacity and permanent wilting point. This optimises the effectiveness of the low annual rainfall received in the Southern Rangelands. The second element concerns **minimising landscape moisture loss**.

## **1. Available soil moisture**

Rainfall effectiveness is influenced by inherent landscape characteristics and land management. Some component elements are canvassed below.

### *Soil type*

Soil water-holding capacity is determined by the sand/silt/clay ratio of the soil. Soils with a high ratio of clay particles tend to hold more water (greater water-holding capacity). Voids (spaces) between soil particles determine infiltration capacities; sandy soils have high infiltration rates. Changes to soil surface characteristics (physical, chemical and biological) modify infiltration rates.

### *Soil depth*

In theory, deeper soils have greater water-holding capacity than shallow ones. However, where perennial grasses have experienced continuous heavy grazing the stunted root systems are unable to access stored moisture situated lower down the soil profile.

### *Physical modification*

Raindrop impact on bare surfaces sorts soil particles (reducing pore space) and increasingly seals the surface, reducing rainfall infiltration. Foliar and/or litter cover reduces raindrop impact. Soil compaction and loss of micro-relief (soil surface roughness) to slow water flow occur from vehicle and stock movements; resulting in concentrated water flows and reduced rainfall infiltration.

### *Chemical modification*

Rangeland duplex/texture contrast soils are characterised by lighter textured surface soil over heavier clayey subsoil. Loss of the lighter textured surface soil through erosion may expose a subsoil which is often sodic or sodic-saline in nature. These surfaces rapidly 'slick' (soil particles disperse filling voids between soil particles) and runoff commences early in a rainfall event, effectively reducing infiltration. They are also highly resistant to seed capture, germination and plant establishment.

### *Biological modification*

Surface obstacles, including vegetation butts and litter, slow overland water flow. This increases infiltration as overland flow has longer contact with the soil surface and greater water depth increases downwards hydraulic pressure. Decayed root canals, sometimes known as biopores, provide infiltration pathways. Vigorous perennial grass plants play an important role as their root systems have deep soil penetration. Micro-fauna activity (usually associated with mulch/litter) likewise creates infiltration pathways and water storage capacity. It also has a role in the nutrient cycle. Fungi and bacteria are directly responsible for most organic matter breakdown but a diverse collection of 'greeblies' enhance decomposition of dead plant material as a result of their feeding activities.

## **2. Evaporation minimisation**

Mulch and litter restricts soil moisture loss from a soil surface by providing shade and reducing drying airflow. Vegetation canopy shade provides a block to solar radiation energy, reducing soil surface water molecule excitement that results in moisture loss to the air. At appropriate plant height and density a moisture saturated air stratum is maintained at the soil/air interface, minimising evaporation. Any shading of the soil surface reduces oxidation of soil organic matter.

### **The nutrient cycle**

The nutrient cycle is closely linked to the water cycle but operates more slowly. Nutrients are slowly absorbed and accumulated into biomass. They are recycled through plant death, decomposition, mineralisation, uptake, and other transformations. Improving the water cycle delivers positive soil nutrient outcomes.

### **The bottom line**

Key ingredients to pastoral profitability are livestock reproduction and growth with minimal mortalities. Animal nutrition is the driver. The Southern Rangelands generally has an adequate supply of protein but energy supply is often the limiting factor for livestock productivity. An ongoing nutritional energy source can be enhanced through appropriate perennial grass management. Intermittent 'green pulses' of annual forbs/grasses resulting from substantive episodic rainfall events on poor condition rangeland **aren't going to do the job.**



*Wanderrie grass country in fair to good range condition (but rapidly declining). Surface micro-relief and surface obstacles still largely intact but small scalds in the foreground starting to join to create concentrated water flow through the perennial grass stand.*

# COMMON 'INDICATOR' SHRUBLAND SPECIES

Jim Addison, Kalgoorlie

Country type	Plant species		
	Desirable	Intermediate	Undesirable
<b>Mulga shrubland</b> <ul style="list-style-type: none"> <li>• Granitic shrubland</li> <li>• Stony hardpan plains</li> <li>• Hardpan plains</li> </ul>	Warty-leaf eremophila	Wilcox bush	Turpentine bush
	Felty fuchsia bush	Native lily	Sandbank poverty bush
	Horse mulla mulla	Curara	Crinkle-leaf cassia
	Tall saltbush	Cotton bush	Rock fuchsia bush
	Cotton bush	Mulga	Blood bush
	Mulga broom bush	Bowgada	
	Mulga bluebush	Wanyu	
	Tall sida	Snakewood	
	Compact poverty bush	Granite poverty bush	
<b>Saltbush/bluebush</b> <ul style="list-style-type: none"> <li>• Breakaway slopes</li> <li>• Undulating plains</li> <li>• Flood plains</li> <li>• River frontages</li> <li>• Level plains</li> <li>• Lake frontages</li> <li>• Nullarbor plain</li> </ul>	Bladder saltbush	False bluebush	Kidney saltbush
	Silver saltbush	Fuchsia bush	Hopbush
	Ruby saltbush	Water bush	Bardi bush
	Scrambling saltbush	Pearl bluebush	Needle bush
	Golden/Georges bluebush	Goldfields daisy	Sago bush
	Low rhagodia	Sago bush	Desert cassia
	Ball-leaf bluebush	Grey fan leaf	3-winged bluebush
	Sage	Broom bush	Tomato bush
	Frankenia	Tar bush	Broom bush
<b>Sandplain</b> <ul style="list-style-type: none"> <li>• Wanderrie</li> <li>• Bowgada</li> <li>• Currant bush mixed shrub</li> </ul>	Climbing mulla mulla	3-winged bluebush	
	Golden/Georges bluebush	Wilcox bush	Desert cassia
	Flat-leaf bluebush	Cotton bush	Sandbank poverty bush
	Cotton bush	Mulga	Tan wattle
	Tall saltbush	Showy eremophila	Showy eremophila
	Mulga bluebush	Bowgada	
	Mulga broom bush	Currant bush	
Warty-leaf eremophila			

**Desirable** plants are productive and palatable to domestic livestock. They drive pastoral production. **Undesirable** plants are unpalatable and of limited value to livestock. **Intermediate** plants are a large group of plants that may or may not be palatable but do not increase to any great extent when other palatable species are removed. Indicator values may vary slightly according to specific site circumstance.

# RANGE CONDITION MONITORING (RCM) – A SITE PEG ALTERNATIVE

Jim Addison, Kalgoorlie

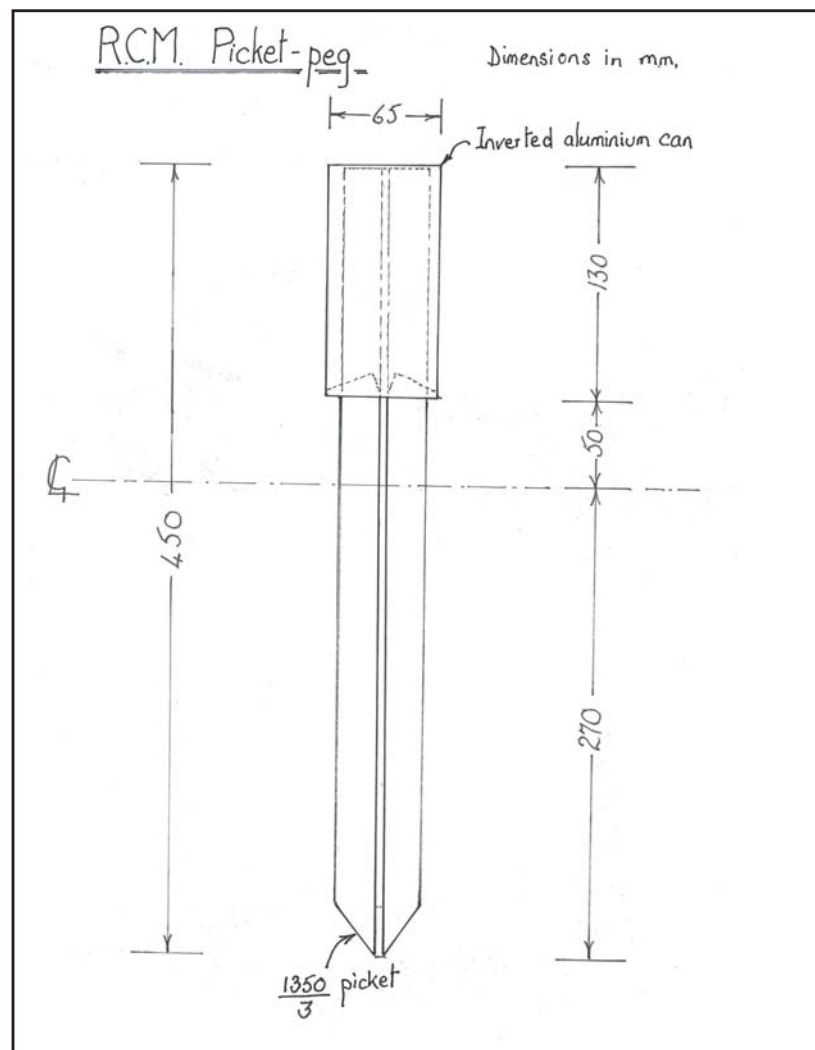
Some pastoralists have remarked about the cost of 8 mm diameter mild steel rod to fabricate RCM site pegs. Current steel price gives these pegs a material cost of about \$0.70 each. As six are required per site this makes a site cost of \$4.20. A cheaper alternative is a peg made from an old discarded picket together with aluminium can.

Cutting pickets to length with a cut-off saw is very quick, including putting a point on one end. An angle-grinder can be used to tidy up the cut surfaces if required. The aluminium can requires a Y cut in the top (which can be done with a pocket knife) to be able to fit it over the picket-peg. The flaps created by the cuts allow the inverted can to 'grip' the picket-peg. An aluminium can is able to survive low–moderate fire intensities but should not be used where hot fires might be expected. If the site is vulnerable to water inundation it is recommended that the bottom of the can receives a small incision. This prevents air becoming trapped in the inverted can that might lift it off the picket-peg. The picket-peg/inverted can combination provides durability, visibility and safety for livestock and personnel.

Using a can is undesirable for aesthetic reasons, however potential physical damage to both human and animals from a picket sticking out of the ground 20 cm requires an easily visible cover.

An old 135 cm sheep picket will produce three pegs (see diagram). A 165 cm cattle picket will make four pegs—each peg a little shorter than that produced by a sheep picket.

Using cut picket-pegs, fence droppers and straight rod, are dangerous to humans and animals due to protruding sharp edges – DAFWA strongly recommends these dangers be considered prior to site installation. For the preferred 'range condition monitoring site pegs' (see August *Rangelands Memo* pg.19).



Dimensions of a picket-peg with aluminium can

## **DAFWA CONTACTS FOLLOWING RANGE CONDITION MONITORING WORKSHOPS IN THE NORTHERN RANGELANDS**

The Department of Agriculture and Food (DAFWA) would like to thank all landholders who participated in the Range Condition Monitoring workshops during April and May in the northern rangelands. DAFWA staff particularly enjoyed the opportunity to work with producers in the field, sharing knowledge on plant identification, discussing what plants are desirable and undesirable and installing monitoring sites. There were 11 workshops completed and combined there were approximately 176 participants. A big thank you also goes to each respective host who did a fantastic job catering, preparing the venue and entertaining at each workshop – your cooperation was appreciated.

Below is a list of DAFWA officers who participated at the various workshops. Please give them a call regarding any queries you have on monitoring site selection, plant identification or data collection.

Name	Office	Phone	Email
Rebecca Dray	Karratha	9143 7006	rebecca.dray@agric.wa.gov.au
David Hadden	Kununurra	9166 4014	david.hadden@agric.wa.gov.au
Wayne Fletcher	Northam	9690 2135	wayne.fletcher@agric.wa.gov.au
Matthew Fletcher	Kununurra	9166 4019	matthew.fletcher@agric.wa.gov.au
Bob McCartney	Derby	9191 0353	robert.mccartney@agric.wa.gov.au
Paul Novelly	South Perth	9368 3492	paul.novelly@agric.wa.gov.au
Kath Ryan	Kununurra	9166 4015	kath.ryan@agric.wa.gov.au



*Brian Fielder (Christmas Creek station) and Gerwin James (Bohemia Downs station) recording plant frequency – quality control*

---

## **UPDATE: GRAZING LAND MANAGEMENT PACKAGE — PILBARA**

---

The Grazing Land Management (GLM) training package development for the Pilbara region is now well underway, with preparation of the draft materials beginning last month.

The survey data collected by the Department of Agriculture and Food (DAFWA) staff across the Pilbara in 2010 will be used to develop the scenario for a 'typical' Pilbara pastoral business that is used as an example throughout the workshop. A range of regionally relevant issues and options will be included in the training package, thanks to the efforts of the steering committee.

Mr Ken Day has almost completed the process of matching pasture production information collected from around northern Australia with pastures and land types of the Pilbara. This will underpin the carrying capacity planning tables incorporated in the training package.

The presentation of the materials to the steering committee as a pilot workshop is likely to be sometime in late 2012.

*For more information, please contact:*

Kath Ryan on 0467 738 906 or at the Kununurra Office 9166 4015; or  
Rebecca Dray at the Karratha Office 9143 7000.

---

## **SOIL CARBON MODELLING FOR THE RANGELANDS**

*Dr Peter Russell, Research Officer, Perth*

---

The Department of Agriculture and Food WA (DAFWA) is turning to the latest advances in soil carbon modelling to improve our understanding of carbon storage potential across the rangelands of Western Australia.

Dr William Parton, Emeritus Professor and Senior Research Scientist at Colorado State University, was recently invited to DAFWA to train staff in the Century™ and DayCent™ ecosystem models, which are being used around the world to simulate the impact of climate change and management practices on ecosystem health, including carbon sequestration.

Rangeland Scientist Dr Peter Russell said modelling was an essential tool for predicting changes in sequestered carbon stocks.

“Modelling involves the input of various parameters, such as climate, different range management practices, animal stocking rates, grazing rotations, fire management, soil and vegetation types (e.g. savannah, shrublands) to create modelled outputs (impacts). Such impacts include effects on plant production, soil carbon, nutrient dynamics, and net greenhouse gas budgets.

“Dr Parton’s visit has improved the research skills of DAFWA staff involved in carbon modelling, which in the future will be an integral part of land management, allowing DAFWA to provide science-based advice to land managers

“The training has enhanced our ability to model organic carbon stocks through time, under different environmental and management scenarios, and will assist DAFWA meet the rapidly increasing demand for scientific advice from pastoralists and other land managers in the WA rangelands.”

It is important to note that modelling will be a critical tool in the exercise of getting the costs of measuring carbon in the rangelands down to an acceptable level.

Dr Parton, co-developer of the Century™ suite of ecosystem models, travelled to Western Australia on two occasions (22–28 January and 10–23 June 2012) as part of DAFWA's Visiting Specialist Person (VSP) program. He is likely to have an ongoing role in supporting DAFWA staff undertaking carbon modelling.

DAFWA staff Dr Fran Hoyle, David Warburton, Jackson Parker, Phil Thomas and Dr Peter Russell, as well as two external consultants Richard Glover and David Galloway, were trained in use of the models.

Training also involved research design, such as identifying the data most relevant to the state's rangelands to be entered when modelling various scenarios, to maximise the validity of modelled output. Some of the data identified included biomass removal by fire, decomposition rates, soil erosion, grazing intensity and competitive growth effects.

During his visit Dr Parton also delivered a public lecture, describing the modelling at DAFWA's South Perth office on 22 June, and attended a carbon-focussed pastoralist field day at Yalleen station in the Pilbara on 20 June.

"Century modelling provides particular technical advantages over other modelling software in use, especially for use in rangeland ecosystems," Dr Russell said.

"Additionally, the Century modelled output can be used to support Australian Greenhouse Gas Inventory reporting obligations."

Dr Russell said Century™ had already been used to model field data collected through two major DAFWA-led rangeland carbon research projects, the *Carbon Capture Project (2009–10)* and more recently, carbon survey work undertaken at Yalleen station (2011) in the Pilbara. This recent data and the modelled outputs were presented at the Yalleen field day.

"Century™ will also be used to model recently completed sampling undertaken at the Muggon Conservation Reserve in the Murchison, and will be used as an essential research tool in future carbon projects.

"Results from carbon research and modelled data will continue to be made available to pastoralists and other rangeland managers and custodians at field days and seminars."

Dr Russell said baseline data collected through carbon research projects will also be used to calibrate and validate the Century™ modelled results.

"It is important that the modelled outputs are substantiated, in order to improve the reliability of the results being produced."

Dr Parton is also currently involved in a substantial collaborative research project modelling carbon abatement with the Queensland University of Technology (QUT) in Brisbane.



*Dr William Parton, Colorado State University, presenting at the Yalleen station field day*

## **GREAT OPPORTUNITIES FOR SUSTAINABLE AGRICULTURE**

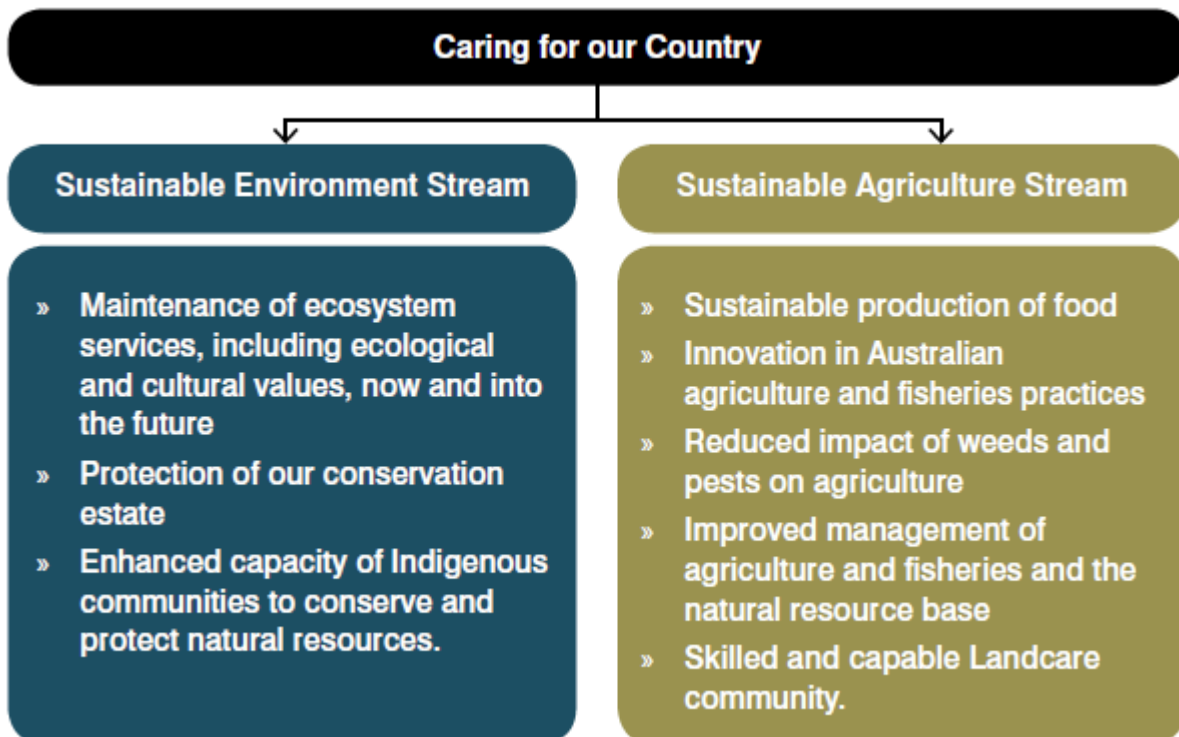
There will be opportunities in the coming year for pastoralists in the WA Rangelands to apply for funding from the Federal Government's second phase of the Caring for our Country Program (CFoC). A total of \$2.2 billion has been committed for five years commencing 1 July 2013.

This time around there will be two streams: one for sustainable environment and one for sustainable agriculture. The sustainable agriculture stream will focus on food security, managing natural resources sustainably and addressing the impact of weeds and pests on agricultural production.

Now is a good time to start thinking about priority issues or projects at a regional or property scale that could be addressed over the next five years to put you in the best position to access these opportunities.

*To discuss issues or ideas please contact:*

Mel McDonald, Regional Landcare Facilitator,  
Rangelands NRM: (08) 9191 7206; [melaniem@rangelandswa.com.au](mailto:melaniem@rangelandswa.com.au)



# A NORWEGIAN AID TO WEATHER PREDICTION

Jim Addison, Kalgoorlie

Timely weather forecasting information is a handy product when planning musters, trucking on dirt roads and prescribed burning. Some readers may have already accessed the Norwegian Meteorological Institute website ([www.yr.no](http://www.yr.no)) and be aware of the products available through that site. It's recommended to those who haven't.

The website opens to a home page where there is a search box in which to insert the place name and country for which weather information is required. A click on **search** will initially bring up a table with a three-day forecast for that place. The table also has a couple of additional options in the right hand 'shortcut' column.

One option is for an **hour-by-hour** prediction for the next 48 hours providing data on the following elements:

- forecast
- temperature
- wind speed and direction
- rainfall.

The second option is the long-term forecast that provides the same elements in six-hourly bites for the next nine days.

As with any weather forecasting tool the further forward the prediction the greater the chance for error. Despite this inherent limitation this website has proved to be a useful addition to other existing forecasting products.



Department of Agriculture and Food



## Cattle Producers

As of 1<sup>st</sup> January 2013, **ALL** cattle will be required to be fitted with an NLIS electronic device before leaving a property.

This includes homebred cattle consigned to abattoirs and live-export depots.

Permits for 'cattle too difficult to handle' and other situations are still available.

For more information, please contact

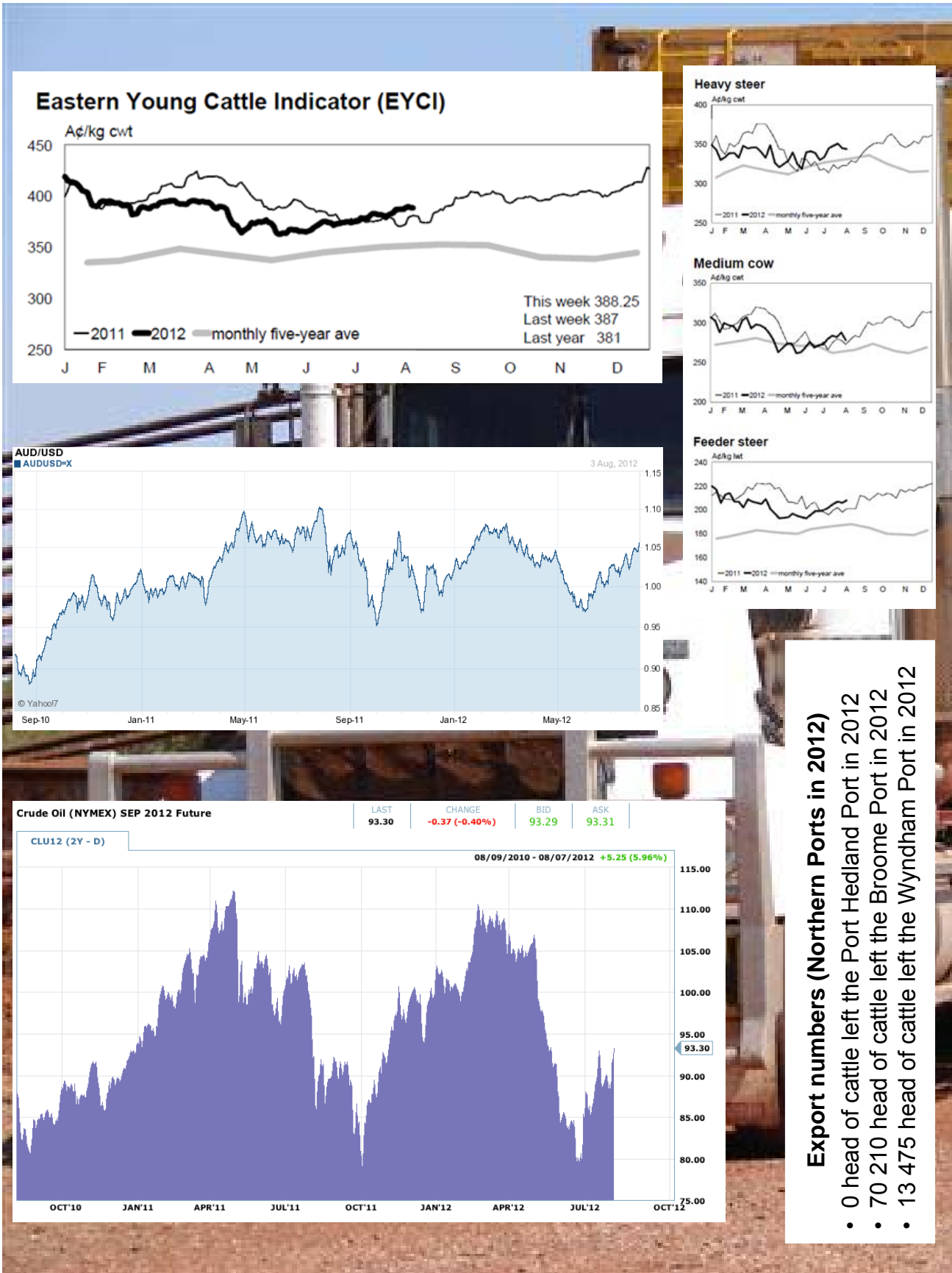
Jack Nixon

Department of Agriculture and Food WA

Bunbury Office

9780 6222 or 0427 089 860

# CATTLE MARKET UPDATE – 3 AUGUST 2012



**Export numbers (Northern Ports in 2012)**

- 0 head of cattle left the Port Hedland Port in 2012
- 70 210 head of cattle left the Broome Port in 2012
- 13 475 head of cattle left the Wyndham Port in 2012