



Date: 3 December 2012

Dear reader

### **RANGELANDS MEMO IS CHANGING**

I am writing to inform you that as of 2013 the *Rangelands Memo* will no longer be posted to land managers and will only be available electronically. The *Rangelands Memo* is transitioning from a mailed publication to a tri-annual email with information to help land managers and industry make proactive decisions for the coming season.

#### **Why change?**

- Faster delivery of *Rangelands Memo* to you
- Strategic information when you need it
- Reduce our carbon footprint.

To stay ahead with the latest DAFWA project developments and receive seasonal news and information as it comes to hand, please subscribe to our email list to keep receiving your free copy of the *Rangelands Memo*.

The new look *Rangelands Memo* December edition is already available electronically.

This is the last printed edition that you will receive. Subsequent editions will only be available electronically.

#### **How to stay informed**

DAFWA still want you to receive this valuable information. To receive future *Rangelands Memos*, we need your email address.

Here's how to subscribe to continue to receive your free copy of the Memo.

1. Visit [www.agric.wa.gov.au/agmemo](http://www.agric.wa.gov.au/agmemo) and follow the links to subscribe online.

OR

2. Fill out your details over the page and send to us via:

Fax 9166 4066

Post PO Box 19, Kununurra WA 6743

In person Drop it into a DAFWA office in Kalgoorlie, Carnarvon, Karratha, Broome or Kununurra.

Remember to subscribe so you don't miss out!

Regards

Matthew Fletcher  
Editor, *Rangelands Memo*

**I wish to subscribe to the *Rangelands Memo*:**

Name	
Email	
<b>(Optional)</b>	
Are you a Grower, Agribusiness or other interested party?	<input type="checkbox"/> Producer <input type="checkbox"/> Agribusiness - Livestock <input type="checkbox"/> Agribusiness - Banking <input type="checkbox"/> Agribusiness - Product/Service Provider <input type="checkbox"/> Veterinarian <input type="checkbox"/> Media <input type="checkbox"/> Grower Group <input type="checkbox"/> Catchment Council <input type="checkbox"/> Local Government Association <input type="checkbox"/> Other

Fill out your details and send to us via:

Fax            9166 4066  
Post           PO Box 19, Kununurra WA 6743  
In person    Drop it into a DAFWA office in Kalgoorlie, Carnarvon, Karratha, Broome or  
                 Kununurra.

# Rangelands MEMO

Copyright © Western Australian Agriculture Authority, 2012



December 2012

ISSN 1033-5757

Vol. 2, No. 3

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
Poisonous plants in the Kimberley .....	4
Where do aerially-delivered dog baits end up? .....	6
Phosphorus management of beef cattle in northern Australia.....	8
Phosphorus supplementation demonstration in the Pilbara .....	10
Battling the thorny menaces .....	11
Range Condition Monitoring – site selection and installation .....	12
New partnership initiative to tackle a weedy problem .....	14
Assessing feed supply.....	15
Update: Grazing Land Management packages – Pilbara and Kimberley .....	16
Plan Prepare Prosper (PPP) – a business planning opportunity for pastoralists in the Southern Rangelands .....	17
BEHAVE concepts take a hold in the Southern Rangelands .....	18
Water ponding on Larrawa station, November 2011 .....	20
Mining activity on pastoral leases in Western Australia.....	22
Keystart loans .....	23
The good oil – BEEF LINK.....	24
Cattle Market Update – 30 November 2012.....	25

## LETTER FROM THE EDITOR

After ~34 years of gracing kitchen, coffee and bedside tables with its presence, the *Rangelands Memo* will now be confined to the desktop computer or laptop – we are going electronic. This decision was not of my design, however it has been made and, with all other *Memos* across the state, will be going electronic in 2013. Therefore I encourage all readers to sign up electronically or complete the attached form on the cover of this publication. *Memo* content will not change; it will just be delivered in another format.

Once again staff across the Rangelands have served up a feast of articles relevant to the land manager and producer. Bob McCartney from Derby office has drawn on his 35 years of experience working across the Kimberley and put together an article on **poisonous plants of the Kimberley**. This article identifies the usual culprits such as ironwood and rattle pod, but also discusses plants that are much less commonly associated with stock poisoning such as couch grass and roly poly. Jim Addison from Kalgoorlie office has once again made a stellar contribution with three articles. Jim's articles discuss *mining activity on a pastoral lease*, *assessing feed supply in the Southern Rangelands*, and *range condition monitoring*.

Producers making sense of their stock phosphorus requirements will appreciate the recently launched and easy to 'read' publication **Phosphorus management of beef cattle in northern Australia**. Peter Smith (DAFWA Karratha), one of the authors, believes this publication has something to offer all producers in the Northern Rangelands and is a recommended read over the 2012/13 wet season. An article on page 8 advises producers on how best to source a copy.

According to the Bureau of Meteorology the WA outlook for December 2012 to February 2013 indicates a wetter than normal season is more likely. The chances of receiving above median rainfall this summer are 60% to 75% over most of western, central, and southern WA (see map on page 3). Such odds mean that for every 10 years with similar ocean patterns to those currently observed, about six or seven years would be expected to be wetter than average over these areas, while about three or four years would be expected to be drier.

November 1 marked the start of the cyclone season. Coastal communities between Broome and Exmouth face the highest cyclone risk of anywhere in Australia. The devastation cyclones can inflict on communities in their path is acknowledged. However, areas such as the Kimberley low rainfall zone, Pilbara and Gascoyne are dependent on cyclonic activity for widespread falls – providing soil moisture for plant growth and overland flow for creeks and rivers. How bittersweet is the environment we live in.

### Summary of the tropical cyclone seasonal outlook for Western Australia:

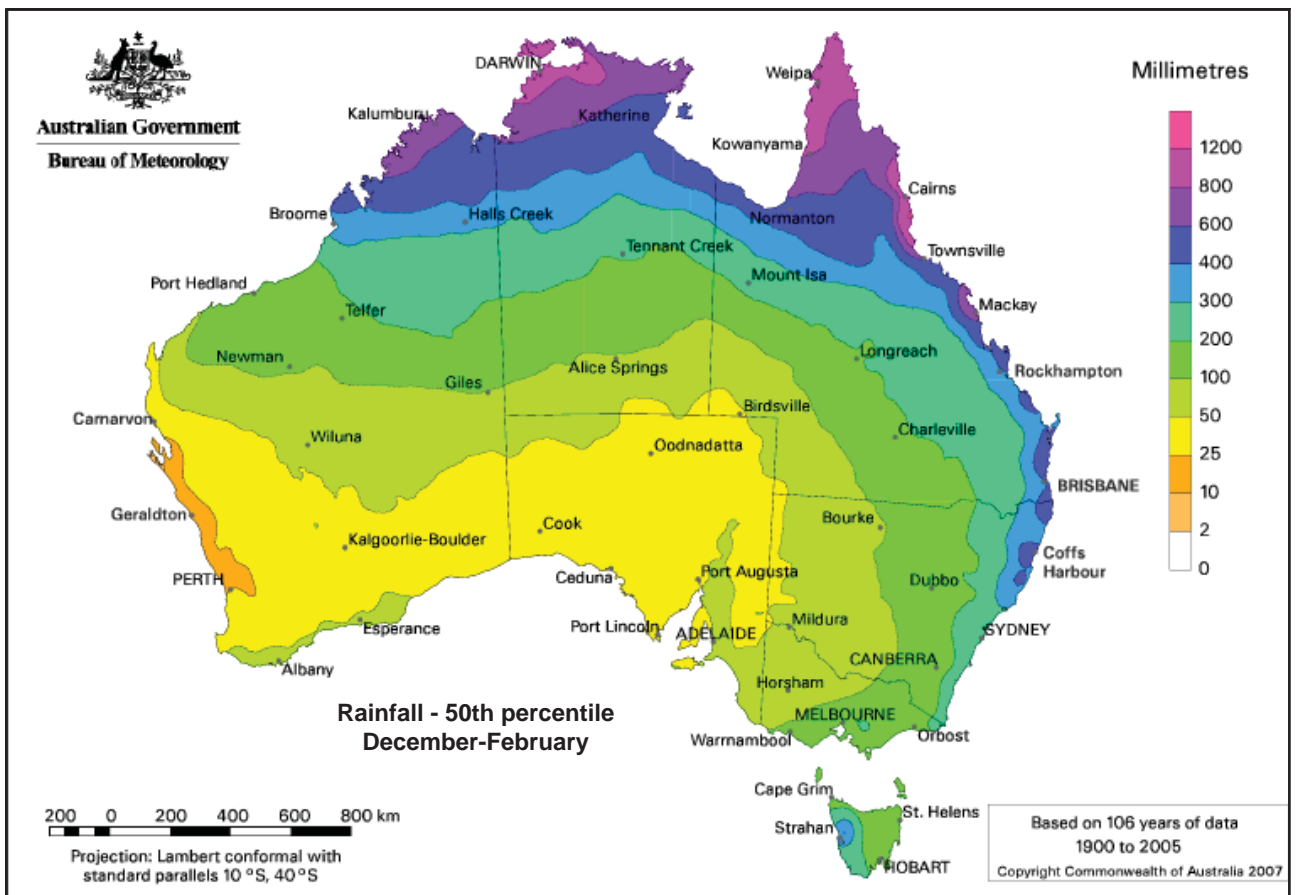
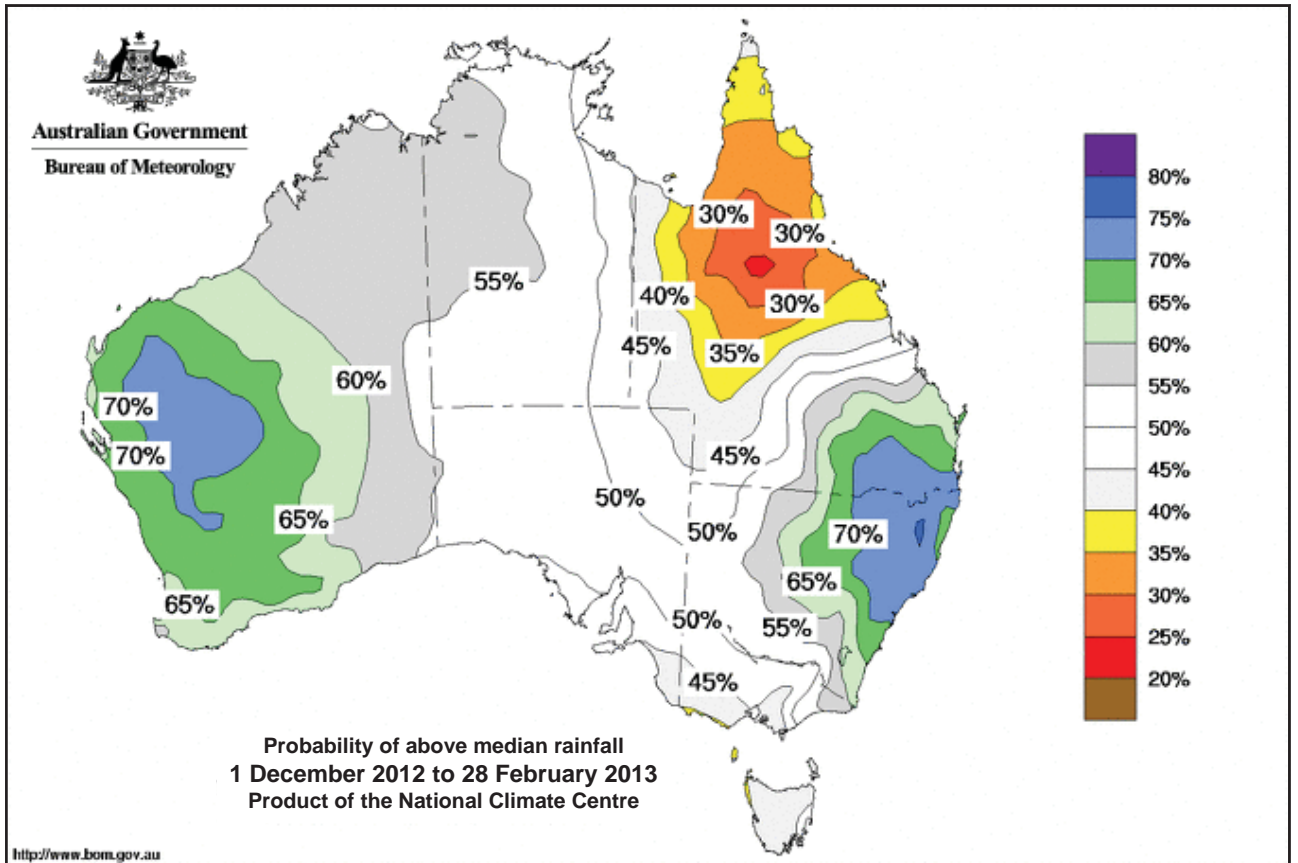
- A 42% chance of an above average number (58% chance of a below average number) of tropical cyclones in waters off the north-west coast (average number is five).
- Likelihood of around two coastal impacts.
- Significant risk of at least one severe tropical cyclone coastal impact during the season.

I wish all readers a safe and merry Xmas.

Happy reading

*Matthew Fletcher*

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



# POISONOUS PLANTS IN THE KIMBERLEY

Bob McCartney, Derby

There are many poisonous plants in the Kimberley but reports of poisoning are relatively rare. Most cases of stock poisoning in the Kimberley are due to *Crotalaria* spp. (rattlepod) or Cooktown ironwood (*Erythrophleum chlorostachys*).

Plant toxicity is affected by factors such as plant species, plant health, stage of growth, soil type, season, and weather. Animal factors such as species, diet selection, body condition, and previous grazing history also contribute to whether poisoning occurs or not, and the severity of poisoning. The table below describes some of the poisonous plants that occur in the Kimberley.

Table 1 Plant-related diseases in the Kimberley

Plant species	Poison	Comment
Rattlepods ( <i>Crotalaria</i> spp.) Specifically Kimberley horse poison ( <i>C. crispata</i> ) and wedge-leaf rattlepod ( <i>C. retusa</i> )	Pyrrolizidine alkaloids	These plants contain hepatotoxic pyrrolizidine alkaloids that cause significant liver disease, resulting in Kimberley horse disease or walkabout disease. These plants are also toxic to cattle.
Ironwood ( <i>Erythrophleum chlorostachys</i> )	Diterpenoid alkaloids	The ironwood tree is extremely poisonous. Very little is required to poison stock. The alkaloids in the plant cause stock to die suddenly or display signs such as staring eyes, pale gums, difficult breathing, and an irregular heartbeat prior to death. Feeding tests in the Northern Territory reported that 56 g of leaf eaten as a feed or given as a watery infusion killed both horses and cattle (Everist 1981).
Rolypoly ( <i>Salsola tragus</i> ) and pigweed ( <i>Portulaca</i> spp.)	Soluble oxalates	These plants may contain high concentrations of soluble oxalates when young and lush. The absorbed oxalates bind with calcium in the blood, effectively causing a calcium deficiency. In tissues, calcium oxalate crystals precipitate, causing local tissue damage by puncturing the tissue membrane. In ruminants, the ruminal flora is able to break down small quantities of oxalates, so acute poisoning usually occurs in situations where there is a sudden high intake of oxalate. Oxalates are more toxic to horses as they lack ruminal flora.
Buffel grass ( <i>Cenchrus ciliaris</i> )	Calcium oxalate	Calcium in this grass is present as insoluble calcium oxalate. In this form the calcium cannot be absorbed, so horses eating this grass for extended periods develop a calcium deficiency. The body tries to compensate by drawing calcium from the bones, leading to bone weakness and a condition called 'big head' (swelling of the head).
Annual sorghum ( <i>Sorghum stipoides</i> ) and couch grass ( <i>Brachyachne convergens</i> )	Prussic (hydrocyanic) acid	Certain conditions lead to high concentrations of cyanogenic glycosides in plants (which can convert to prussic acid); young plants with green growing shoots are most toxic. Absorbed prussic acid rapidly enters cells throughout the body and blocks their ability to utilise oxygen, resulting in asphyxia. Signs of prussic acid poisoning are muscular trembling, muscle weakness, and rapid and deep breathing. Death is usually rapid.
Whitewood ( <i>Atalaya hemiglauca</i> )	Unknown	Whitewood seeds are poisonous to horses, cattle and sheep. Pen trials recorded that horses fed 566 g of seed over two days, died on the fourth day. Symptoms include: staggering gait, oedema of the eyelids, glassy eyes, a shivering of the shoulder muscles, and death.

Kimberley horse poison is a small annual to short-lived perennial plant to 30 cm high with yellow-green pea-like flowers, hairy green to grey leaves, and small, hairy pods containing one seed. They are found on disturbed sandy soils and are most commonly eaten after the first storms as the plant greens rapidly after rain. The pyrrolizidine alkaloids found in rattlepods are produced by plants as a defence mechanism against insect herbivores. Horses can eat small amounts without showing symptoms, but over a period of time (cumulative effect) it affects their liver. Eventually they start to stagger and wander aimlessly around bumping into obstacles. By that time it is too late for treatment.



*Kimberley horse poison is commonly found growing on disturbed sandy soils.*

Wedge-leaf rattlepod is a tall annual to 80 cm high with wedge-shaped green leaves and bright yellow pea-like flowers. The pods rattle when mature. They are found on degraded river frontage country and are more readily eaten when other green feed is not available.

The Cooktown ironwood tree can grow to 15 m tall. The rounded leaves are 2 to 4 cm in diameter. The flowers are cream-coloured and the seed pods are flat and 10 to 15 cm long. All parts of the plant are poisonous and only a small amount ingested can be fatal. Animals in yards have been known to eat ironwood suckers when they can be reached through the rails.



*Cooktown ironwood sucker; all parts of the plant are poisonous and only a small amount can be fatal.*

## Conclusion

Young animals are generally more at risk than adults and animals unfamiliar to an area are more at risk than animals that have been bred in the area. The risk of poisoning can be reduced by allowing animals access to a plentiful and wide range of forage. There is no doubt that with many poisonous plants there is some learned aversion, thus stock in a paddock with a particular plant usually won't have a problem with it but newly introduced stock may all die from eating it.

## Reference and further reading

Everist, S 1981, *Poisonous plants of Australia*, Australian Natural Science Library.

McKenzie, R 2012, *Australia's Poisonous Plants, Fungi and Cyanobacteria*, CSIRO Publishing.

Petheram, R & Kok, B 2003, *Plants of the Kimberley Region of Western Australia*, University of Western Australia Press.

## 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.

# WHERE DO AERIALY-DELIVERED DOG BAITS END UP?

Effective wild dog control involves using a combination of control techniques including baiting, trapping, shooting and fencing. Aerial baiting is recognised as a cost-effective and efficient way of controlling wild dogs across large and inaccessible areas. However, aerial baiting may use more baits than required for efficient wild dog control, resulting in inflated costs and increased risk to non-target animals. One of the factors likely to influence the efficacy of aerial baiting in the rangelands has been a lack of knowledge about the proportion of baits that land in locations which are inaccessible to wild dogs. As there are currently no good estimates of the proportion of baits that land in inaccessible locations, additional baits are often included when baiting specific target locations. To address this gap in knowledge DAFWA has undertaken research, funded by the national Australian Pest Animal Research Program, to determine the availability of aerially deployed wild dog baits in the rangelands.

## Preliminary trial

Prior to our main experiment which would use radio-transmitters inserted into non-toxic dried meat baits and deploy them in an aerial baiting program, we conducted a preliminary trial. The purpose of this trial was to determine: (a) if baits with transmitters fell in the same way as non-transmitter baits; and (b) if transmitters would withstand being dropped from an aircraft. The trial also enabled us to determine the distance and angle that baits fall from the aircraft.

With the help of Tracey Vinnicombe of DAFWA Kununurra, DAFWA Invasive Species Science staff deployed non-toxic baits with and without transmitters from an aircraft travelling at 300 ft and 100 knots in repeated runs over Carlton Hill station airstrip in the Kimberley. The delivery point of each bait was recorded by a GPS in the plane and the final location of each bait on the ground was recorded on a hand-held GPS.

We located 96% of the non-toxic baits deployed, including all of those with transmitters. We found that despite being slightly heavier, baits with transmitters fell in a similar manner to non-transmitter baits, although they did not fall as wide of the aircraft as non-transmitter baits. We were also pleased to find that all transmitters survived multiple drops.

The trial allowed us to determine that under standard baiting conditions of flying in a straight line at 100 knots, at an altitude of 300 ft in relatively still conditions, dried meat baits generally fall forward of the point where they were dropped by 99 m and wide of the aircraft by 9 m.

## Availability experiment

We tied our availability experiment in with the Pilbara Recognised Biosecurity Group (RBG) aerial baiting this year with the help of local land managers and Mick Elliott and Andrew Longbottom of Karratha DAFWA. During the RBG baiting we dropped non-toxic transmitter baits across four landforms in the Pilbara (open ground with tussock grass, riparian vegetation, breakaways and gorges). We then located the baits using radio-telemetry and visually assessed their availability to wild dogs as high, moderate or low. For example, if a bait was sitting on open ground it was considered high availability. In comparison, if a bait was deeply embedded in the centre of a large clump of spinifex it was considered low availability.

When considered across all landforms, 92% of baits fell into the high availability category with a further 7.5% considered to be moderately available. Availability was highest (100% high



availability) on open ground, but in all other landforms over 95% of baits fell into the high or moderate availability categories (Figure 1). Of the very few baits that fell into the low availability category, most were embedded in spinifex.

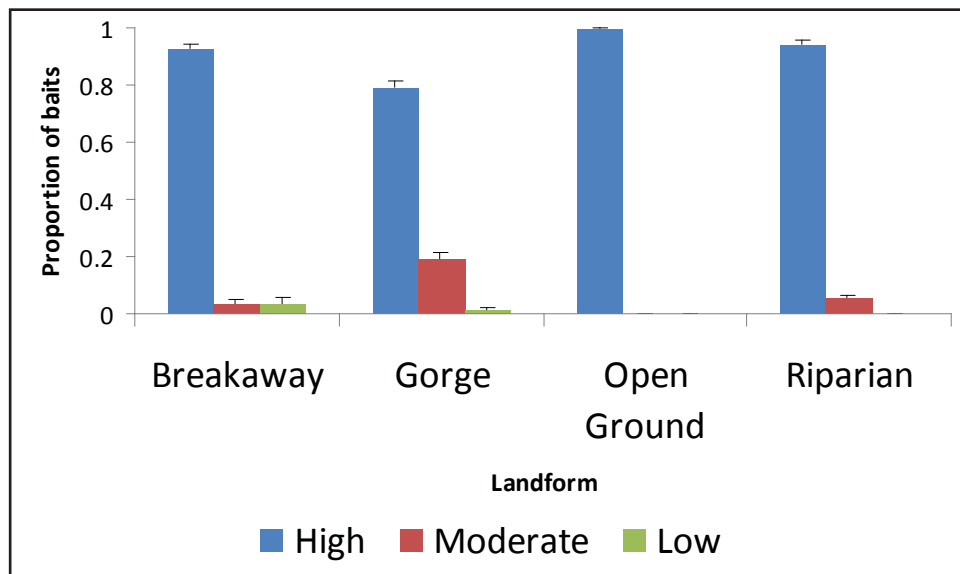


Figure 1 Bait availability across four rangeland landforms: breakaways, gorges, open ground and riparian vegetation

## Conclusion

Our preliminary trial gave us an understanding of the distances that baits fall, from where they are released in the air to where they are found on the ground. At standard operating speed and altitude in calm conditions, baits on average fall 99 m forward and 9 m wide of the point of release. These figures can be used by pilots and bombardiers to predict where baits are likely to land with greater accuracy.

The availability experiment revealed that bait availability was high across all landforms with very few baits falling into the low availability category. Providing aerial baiting is targeting areas where dogs are known to be active, landholders in the rangelands can be confident that the vast majority of baits deployed from aircraft are available to dogs. Therefore there is no need to drop extra baits to compensate for any considered potentially inaccessible. Losses are lowest on open ground with tussock grass, but even in steeper terrain with spinifex, there are only minor losses to low availability locations. The high availability of baits in rangeland aerial baiting corroborates the importance of aerial baiting as an effective component of integrated wild dog control.



Tracey Vinnicombe (DAFWA Kununurra) and Ken Rose (DAFWA Invasive Species Science) prepare for a drop of non-toxic transmitter baits at Carlton Hill

# PHOSPHORUS MANAGEMENT OF BEEF CATTLE IN NORTHERN AUSTRALIA

Great news for producers in WA's Northern Rangelands...the manual *Phosphorus management of beef cattle in northern Australia* is now available.



Phosphorus (P) supplementation of cattle grazing deficient and marginal P country will result in better conditioned cattle coming out of the wet. By comparison dry season supplements based on urea generally reduce the rate of weight loss of breeders rather than promote weight gain as is the case with P supplementation during the growing season.

In P deficient or marginal country, wet season P supplementation combined with appropriate weaning strategies can significantly reduce the need and cost of dry season supplementation. Like HGPs, P supplements work best for cattle grazing marginal and deficient country when plants are actively growing – all the other nutrients are in the grass for free!

Pertinent to the Kimberley, a case study on phosphorus (P) usage at Watson River, Cape York, Queensland is included in the manual. Highlighting the commitment by owners Cameron and Doreen Quartermaine to ensure P is available to all stock over the wet season (average 1500 mm of rain), wet season access to P stations is also a challenge in the Kimberley high rainfall zones. Strategies used are: purpose built bridges (for quad bikes only) to enable access when creeks are flooding; shelters to protect lick from spoil; and shipping containers storing 14 tonne are used to ensure lick is available throughout the wet season. An example of 'commitment'.

Case studies closer to home on Napier Downs and Yardoogarra station highlighted the opportunity to improve business profitability on P deficient country, such as Pindan. Improvements in business profitability from P supplementation were made through increasing the numbers of calves weaned, females sold and better prices received for sale cattle – reflecting improved sale weights.

The table below is an extract from the manual outlining major pasture communities across the Pilbara and Kimberley and their considered P status.

## Western Australia (Kimberley)

Soil-Vegetation	Distinguishing features	P Status
Pindan	Curly spinifex and ribbon grass; red and yellow sands with low scrubby woodland	Deficient
Spinifex	Curly and soft spinifex with eucalypt open forest	Deficient
Tallgrass pastures	Ribbon grass, kangaroo grass, cane grass and black speargrass under eucalypt woodland	Deficient
Midgrass pastures	Ribbon grass, bluegrass, brown top, kerosene grass, wire grass under low eucalypt woodland	Deficient
Shortgrass pastures	Ribbon grass, <i>Enneapogon</i> , curly spinifex under open eucalypt woodland of bloodwood and southern box	Marginal
Mitchell grass	Black soil plains in eastern Fitzroy basin, extending north-west into the Meda and May River basins; deficient in sodium	Marginal
Frontage	On levees of major rivers – Fitzroy and Ord and tributaries; ribbon grass, bluegrass, sorghum under open eucalypt woodland	Adequate

**Western Australia (Pilbara)**

Soil–Vegetation	Distinguishing features	P Status
Spinifex	Hard and soft spinifex on rocky outcrops and sand plains with scattered Acacia shrubs	Deficient
Mulga	Shrubland of mulga, sandalwood and cassia with <i>Aristida</i> and sparse annual grasses	Deficient
Bluebush/saltbush	On hard-setting loams over red clays in low shrubland; sparse seasonal grasses	Marginal
Coastal plains	Tussock grasslands; Roebourne Plains and buffel grasses	Marginal
Mitchell grass	Fortesque flood-out country and on basaltic soils in Chichester and Hammersley Ranges	Adequate
Frontage	On levees of rivers and streams	Adequate

**Key messages for managing phosphorus nutrition:**

In many regions of northern Australia, phosphorus (P) is a serious nutritional limitation to cattle production, reducing its efficiency and profitability. Some general principles can be applied to strategies and practices when feeding phosphorus to beef cattle.

1. The animals likely to respond to P supplements most are growing stock, late-pregnant heifers and cows, and lactating cows.
2. Deficient animals respond best to P supplement when their diet has adequate protein and energy. This is why P supplementation is most effective during the wet season.
3. Signs of acute phosphorus deficiency include bone chewing, broken bones, peg-leg, poor body condition of breeders and botulism.
4. There are no simple diagnostic tests for the P status of cattle. Blood and faecal P are the most useful indicators.
5. If P is fed over the wet season on deficient country:
  - young growing stock can increase their growth by 30–40 kg/year
  - breeders can increase weaning rates by 10–30%.
6. Deficiency is related to soil P status. As a general rule, where soil P levels:
  - are deficient (5 mg/kg or less), all classes of stock are likely to respond to feeding P
  - are marginal (6–8 mg/kg), young breeders are likely to respond to feeding P
  - exceed 8 mg/kg, the economic benefit from feeding mature cows diminishes.
7. Responses to P supplement may be lower if animals running on P-deficient country have access to adjacent areas of high-P soils, such as frontage country.
8. Supplements should be compared on the cost of their P content, on the practicality of feeding out and on whether the animals will be able or willing to eat target amounts.
9. A typical wet season loose-mix P supplement should contain at least 8% P; a typical dry season supplement will contain 2–4% P and also non-protein nitrogen (e.g. urea).
10. On deficient country, lowering the stocking rate will not reduce the need to feed phosphorus.
11. Where the native pasture on deficient country contains sufficient stylo, cattle may respond significantly to P supplement during the dry season because of the extra protein in their diet.
12. Because cattle eat more pasture when P supplements are fed, stocking rates should be reduced to avoid overgrazing.
13. The economic benefits from feeding P are maximised when done in conjunction with other aspects of good herd management.

**To order and/or download:**

- Contact your local DAFWA office:
  - Bec Dray in Karratha on 9143 7000
  - Anne Marie Huey in Broome on 9194 1400
  - Matthew Fletcher in Kununurra on 9166 4019
- To order hard copies of the publication, call the MLA membership services hotline on 1800 675 717 or email [publications@mla.com.au](mailto:publications@mla.com.au)
- To download, go to <http://www.mla.com.au/Publications-tools-and-events/Publication-details?pubid=6024>



## ***PHOSPHORUS SUPPLEMENTATION DEMONSTRATION IN THE PILBARA***

*Rebecca Dray, Karratha*

It is a known fact that a high percentage of northern Australian pastures are deficient in phosphorus. During the wet season when other limiting nutrients like protein and energy are naturally high, phosphorus is the key mineral limiting growth in cattle.

This producer demonstration group has been formed to try to get 'real' information about the benefits of supplementing cattle in the Pilbara. The demonstration is trying to achieve increases in kilograms per breeder produced in both weight gains and number of animals turned off from the same area on stations with low P soil types. Financial data will back up the herd records to prove that feeding supplements will be an asset to the business.

The first year of the project will demonstrate growth rates associated with urea and phosphorus supplement mixes for the dry and growing seasons. The second and third year will be demonstrating the effectiveness of supplements to get females to critical mating weights and the reconception of lactating females. The cost and benefit that is associated with supplementation will be calculated and compared with the animal performance data.

Faecal sampling of the current year's maiden heifers at Glenflorrie has shown that dietary P is below acceptable. There were good levels of energy and protein and if given phosphorus supplements the animals would respond well. Soil sampling results gave further confirmation that the available phosphorus was in a marginal to deficient state across most of the paddock. After the first significant rainfall event the heifers will be split into four groups; phosphorus supplements will be available to two of the four groups. This is likely to occur during late December or early January. At the end of the growing season the heifers will be mustered and redrafted, ready for the dry season urea-based supplement to be given to half of the groups.

At the end of the growing season muster we will be hosting a paddock visit at Glenflorrie station for everyone to come and see the animals first hand. If you wish to join us, please contact me at the Karratha Office on 9143 7006.

## BATTLING THE THORNY MENACES

*Linda Anderson, Pilbara Mesquite Management Committee*

The Pilbara Mesquite Management Committee (PMMC) is continuing the battle against the invasive species mesquite and parkinsonia in the Pilbara. In 2012, our projects have been sponsored through Rangelands NRM, the State NRM Program and Royalties for Regions, ongoing until June 2013.

**The objectives** of our projects are to ensure that mesquite and parkinsonia management across the Pilbara region is coordinated, that strategic weed control programs and partnerships are developed across land tenures and that investment is focused on the most at-risk and high priority infestations.

**Our projects** are spread across the Pilbara—from controlling parkinsonia in the DeGrey catchment and eastern Fortescue catchment to mesquite management in the western Ashburton catchment. We are tackling large areas infested by varying degrees and species of each weed—300 000 ha of tree-form and hybrid mesquite and 785 km of parkinsonia infested waterways. We are working across all tenures—active and exploration mining tenements, privately leased pastoral stations, company leased pastoral stations, Indigenous leased pastoral stations, reserves and unallocated crown land.

Despite all of these challenges, the PMMC has embraced the task and is delivering a range of on-ground and capacity building activities with our extensive network of partners.

**The outcomes** of our on-ground projects during the last 12 months include:

- control of mesquite and parkinsonia on eight pastoral leases and six mining tenements
- 450 000 mesquite plants controlled across 45 000 ha of land
- 130 km of priority waterways treated for parkinsonia
- an additional 2000 ha of land controlled of mesquite using mechanical means
- aerial survey of 700 km of the Ashburton catchment to detect weeds.

To increase the **capacity of land managers** to develop and undertake successful weed management programs, a number of publications have been developed and training undertaken, including:

- Publication: *How to prepare a parkinsonia control program in the Pilbara*
- Publication: *Effective control of mesquite – a Pilbara approach*
- Signage: *How to mix and apply Garlon 600®*
- Training of 10 weed contractors in ChemCert and as licensed Pest Control Technicians, and 20 station staff on safe use and handling of herbicides and GPSs.

The PMMC and our stakeholders would like to recognise the important role that external funding is playing in the battle against the thorny menaces in the Pilbara. The support from Rangelands NRM with employing a Project Manager to coordinate activities and funding the project is invaluable to our success. Funding provided by Rangelands NRM, the State NRM Program and Royalties for Regions has added significant value to the degree to which we complete on-ground control programs annually, and combined these funding programs have considerably increased the knowledge of, and commitment to, controlling mesquite and parkinsonia into the future.

*Interested in more information or to become a partner?*

Contact Linda Anderson on [linda@pilbaramesquite.com.au](mailto:linda@pilbaramesquite.com.au) or (08) 9144 1844.



*PMMC members inspecting recent mechanical control of dense hybrid mesquite around Mardie Pools*



ROYALTIES  
FOR REGIONS



## ***RANGE CONDITION MONITORING – SITE SELECTION AND INSTALLATION***

*Jim Addison, Kalgoorlie*

The Pastoral Lands Board (PLB) recently announced a delay in the implementation of the Range Condition Monitoring (RCM) program. However, pastoral lessees could well use the additional lead-in time to get their monitoring site networks installed. This installation process consists of both 'homestead' and 'on the flat' activities. These are summarised below.

### **Homestead**

The homestead activity consists of planning and preparation.

- Confirm the number of sites required by referring to previous correspondence from the PLB.
- Using the pastoral potential map supplied in the workshop 'show-bag', plan the geographic distribution of sites. Refer to pages 6 and 7 of the supplied monitoring manual for site selection criteria.
- Fabricate/assemble site materials, i.e. each site requires six site pegs and two steel pickets. Equipment and materials required can be found on page 8 of the manual – don't forget the installation recording paperwork.
- The PLB requires that data for a maximum of only four plant species be recorded at any one site, preferably two desirable and two undesirable species. Gather plant identification and indicator value information for use during site selection out on the flat. Some plant species information is located at the rear of the monitoring manual. Additional information was included in the April 2012 edition of the *Rangelands Memo* (page 12).

## On the flat

This activity is the practical site selection and installation phase.

- Employing the site selection criteria from the manual, pick the approximate site position. The site should be placed so that it may be relocated with relative ease – the person doing site reassessments may not be the same person who installed the site.
- It is advisable not to drive right up to the site as this creates preferred pathways for grazing animals and surface water flows that may impact the site.
- The RCM site installation method and site diagram is on pages 9 and 10 of the manual. Monitoring site layout is common for both the northern grasslands and southern shrublands.
- Once satisfied that the site meets the site selection and layout criteria the permanent components (six pegs and two pickets) may be hammered into place.
- The aluminium site identification tag should be fastened to the rear picket using the second hole from the top. This is to prevent birds (mainly cockies) from sitting on the post and vandalising the tag.
- Complete the site installation paperwork.
- Make sure that all installation equipment is returned to the vehicle before leaving the site.

If the initial site assessment is to be carried out in conjunction with the installation make sure additional equipment and paperwork required is in the vehicle. Initial site assessment information may be found on pages 11–17 of the manual.



*Range Condition Monitoring site No. 24, Ella Valla station, Carnarvon, No.14 paddock, land system – Ella, pasture community – Acacia sand plain, desirable species – Wilcox bush (Eremophila forrestii), intermediate species – cotton bush (Ptilotus obovatus) and curara (Acacia tetragonophylla), undesirable – felt leaf cassia (Senna artemisioides subsp. helmsii), soil surface condition – good.*

## **NEW PARTNERSHIP INITIATIVE TO TACKLE A WEEDY PROBLEM**

*Andrew Reeves and Tim Thompson, Bunbury*

DAFWA Invasive species staff recently met with the Carnarvon Rangelands Biosecurity Association (CRBA) to develop a strategic plan for the management of prickly bushes within the Carnarvon region.

Negotiations have commenced with the major stakeholders in the region including state and local government agencies through the CRBA to develop a partnership for a coordinated approach to the management of prickly bushes within the region.

The term prickly bushes includes such weeds as mesquite (*Prosopis* spp.) and parkinsonia (*Parkinsonia aculeate*); both are Weeds of National Significance and management of these species using a 'tenure blind' approach will help control these species regardless of land ownership.

Tenure blind is an approach where the weed is treated regardless of land ownership. This provides a better management outcome as it allows for those individuals undertaking the control to concentrate their efforts on managing the weed outcome rather than spending large amounts of time trying to determine which land manager is responsible for each patch of land.

A five-year management strategy is being developed that will focus on both eradication where achievable and containment, along with a partnership agreement. Where required, enforcement of control can be carried out, however a cooperative approach to weed management will always be the preferred outcome.

DAFWA's role will include development of the strategic plan, annual operational plan, and training landholders and contractors in best practice control methods. The CRBA intends to employ a project officer.

Work will continue on planning and communication over the summer of 2012/13 with on-ground work expected in autumn of 2013.



*DAFWA employee Tim Thompson and David Gooch, Deputy Chair of the Carnarvon Rangelands Biosecurity Association*



# ASSESSING FEED SUPPLY

Jim Addison, Kalgoorlie

A fundamental of livestock production and range condition maintenance is a producer's ability to manage stocking rate (livestock demand) within carrying capacity (feed available). Estimating feed available can at times be a daunting task, especially in the shrublands. A 'simple' and relatively robust method is canvassed below.

**Step 1.** Estimate the area required to satisfy a daily DSE/CU\* feed requirement. This is best done using the 'square method'; a guide to using this method is in the publication *Pastoral Profits Guide* and is available from your local DAFWA office. It is assumed that only 30% of the forage biomass will be utilised. It's usually easier to make this assessment using a daily DSE feed requirement and then multiplying by 7 to get a daily CU requirement.

*Example:*

Estimate No.	Square – side length (metres)	Area required to feed 1 DSE for 1 day (square metres)
1	34	1156
2	45	2025
3	29	841
4	36	1296
5	23	529
Average area required to feed 1 DSE for 1 day (square metres)		<b>1169 (m<sup>2</sup>)</b>

**Step 2.** Convert the average square area to DSE or CU days/hectare

A hectare is 10 000 m<sup>2</sup> so  $\frac{10\ 000}{1\ 169} = 8.6$  DSE days/ha

**Step 3.** Calculate the total available feed in a management unit in DSE or CU days

Assume a paddock size of 6400 ha.

Therefore total feed availability is  $6400 \times 8.6 = 55\ 040$  DSE days (7863 CU days)

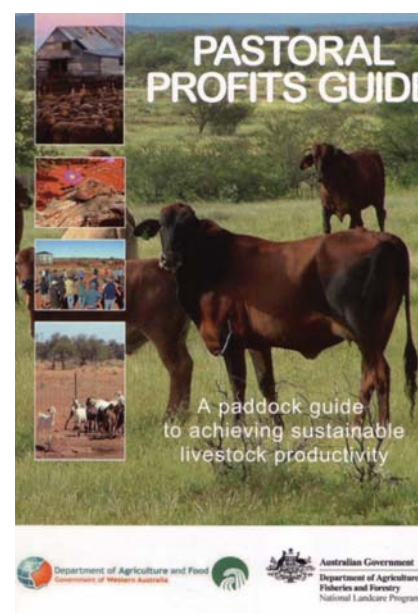
If a flock size of 450 DSE is being run in the paddock then without further pasture growth there are  $\frac{55\ 040}{450} = 122$  flock grazing days

450

Ongoing livestock performance (using body condition scoring) will indicate the accuracy of assessments and adjustments in technique can be made to minimise future errors.

This step by step approach enables producers to make a rapid assessment in the paddock. This method is illustrated in easy to follow table form (no complicated mathematics) in the *Pastoral Profits Guide* – available from DAFWA offices in Kalgoorlie, Geraldton and Carnarvon. The guide also shows how to estimate forage demand – again using table form, together with supply/demand reconciliation information.

\* DSE = Dry Sheep Equivalent, CU = Cattle Unit



## UPDATE: GRAZING LAND MANAGEMENT PACKAGES — PILBARA AND KIMBERLEY

The pilot workshop for the Grazing Land Management (GLM) training package for the Pilbara region was held on 21 and 22 November at Karratha. Steering committee members knuckled down to an intensive day-and-a-half of presentation and review of a condensed version of the full workshop.



Col Paton and Anne Marie Huey presented the draft materials prepared by the team and the steering committee appraised the workshop presentation and content, discussing issues and providing comment which will be used to improve the final version.

Rebecca Dray has mapped 'Acacia Downs' – a hypothetical, 'typical' Pilbara pastoral business that is used as an example throughout the workshop. The Breedcow Dynama herd modelling software was used to test scenarios for the effects of management change options to the bottom line for the hypothetical owners. The parameters used for modelling were provided by information collected from real businesses, including those of the steering committee members.

Issues on Acacia Downs station and options for their management were tested by the steering committee during the pilot workshop. Participants worked through calculations for converting number of animals to cattle units, estimating pasture type carrying capacity, estimating paddock carrying capacity and forage budgeting examples.

The feedback from discussions and comments from pilot workshop participants will be incorporated into the final version over the next three months, and it is anticipated that the final version will be ready for delivery by the middle of 2013.

A quote from one steering committee member is included below.

***“Great course... the time dedicated to individual property planning in the final module is a really good idea. I would attend the full workshop if I got the chance.”***

The package has already been developed for the Kimberley, and workshops were last run in 2009. Feedback at the time was overwhelmingly positive so another workshop is being run in February 2013 at Liveringa station. Thanks to funding by Rangelands NRM the course is free for returning businesses and heavily discounted to \$200 for new businesses. The regular cost of this course is \$1650 per person.

The three-day workshop is a combination of classroom-based presentations, mixed in with practical, hands-on sessions that allow participants to put the information into practice.



*L-R: Robyn Richardson (Mt Florance), Bill Cotching (Rangelands NRM), Annabelle Coppin (Yarrie), Geoff Mills (Warrawagine), Michael Clinch (Peedamulla/Nallan) calculating carrying capacity for one of the paddocks on Acacia Downs.*

At the end of the three days, pastoralists will have an understanding of the key principles that underpin effective grazing management and how the different strategies can impact on their bottom line.

According to the 2010 Pastoral Industry survey, nine of the ten managers who attended the 2009 workshops made changes to their businesses as a direct result of attending the course.

Places are still available for the Liveringa workshops, so to reserve your place or for more information please contact:

Anne Marie Huey in Broome – 9194 1428 or 0417 993 142

Kath Ryan in Kununurra – 9166 4015 or 0467 738 906

Rebecca Dray in Karratha – 9143 7000

## ***PLAN PREPARE PROSPER (PPP)***

***– a business planning opportunity for pastoralists in the Southern Rangelands***

Pastoral businesses in the Southern Rangelands have an opportunity to participate in a free program to develop a strategic business plan for the future. Experienced professionals facilitate the five-day program so that participants walk away with a five-year strategic business plan and the associated budgets.

Bank personnel encourage pastoralists to participate in these PPP workshops. A five-year business plan with the associated budgets provides a bank manager with a clear picture of the business. It will improve a pastoralist's ability to negotiate a financial package that works for both parties and it will inspire confidence in the capacity of the business manager.

Reimbursements of 'out of pocket' expenses for attending the five-day program are available to a maximum of \$1000.

Pastoralists who have completed previous PPP programs are invited to attend a one-day Planning for Profit 'refresher' program.

Dates and venues for each program will be negotiated to best suit the applicants.

For further details and to complete an application form, please see the department's website at: <http://www.agric.wa.gov.au/> and click on Workshops.

For additional information, please call Greg Brennan on 9956 8554 or 0418 222 406.



*Salmon gum (Eucalyptus salmonophloia), Western Nullarbor.  
Photo supplied by Wayne Fletcher.*

# BEHAVE CONCEPTS TAKE A HOLD IN THE SOUTHERN RANGELANDS

Greg Brennan, Geraldton

Experienced livestock managers know that livestock moved from one pasture environment to another can take up to two years to adapt and perform. This is of importance when moving stock from grasslands to shrublands or vice versa, particularly in dry seasons. Research by Prof. Fred Provenza and his BEHAVE team at Utah State University, combined with the Stress Free Stockmanship skills of Bruce Maynard, suggests that this problem can be overcome and adaptation time reduced to a matter of days rather than years.

These developments have not taken place overnight but are the result of 30 years of research by Fred Provenza and the BEHAVE team at Utah. Fred states that his goal is “to help people become aware of behavioural principles and processes that foster healthy relationships among soil, plants, herbivores and people”.

Rangelands NRM funded a series of three workshops in 2010 where these BEHAVE principles were explained by Prof. Fred Provenza, Dean Revell of CSIRO and Bruce Maynard, a farmer from Narromine, NSW.

The BEHAVE principles have excited producers in the USA and Australia as some see that using principles of animal behaviour can reduce costs and improve productivity. It is a holistic approach for developing livestock production systems that closely ‘fit’ the landscape’s capabilities which serve to improve rather than degrade land condition.

At the workshops Bruce Maynard demonstrated his ‘Stress Free Stockmanship’ principles which inspired producers to apply for a 50% subsidy from Rangelands NRM to bring him back to the region. In the first two days of the four-day workshop, Bruce teaches Stress Free Stockmanship based on the principles developed by Bud Williams who many will have met or known by reputation. The second two days of the four-day workshop is run a few months later after people have had time to practise their stock handling skills. Dean Revell of CSIRO and staff of DAFWA and Rangelands NRM are involved in these two days where the BEHAVE principles are expanded from stock handling skills to more broadly, how BEHAVE principles can be used to improve the way animals are handled in many situations, how they graze the landscape and for improving station profits.

Of particular interest to producers is the demonstration of how ‘de-stressed’ animals begin to graze pastures that they normally would not touch. It seems that ‘de-stressing’ comes down to convincing every individual in the mob that the humans managing them are not predators but providers. When they are de-stressed, animals will begin to express their natural inclination to experiment by tasting all the plants that



Prof. Fred Provenza and Tim Shallcross of Bullara station near Exmouth at the BEHAVE workshop

are available. They then rely on a feedback loop of about 7 hours between their digestion system and their brain that tells them whether the material is OK to eat and if so, how much is OK to eat. This all seems fanciful until you see it with your own eyes (or on YouTube).

Google search for '*stress free stockmanship serrated tussock*' to see the videos.

Rangelands NRM funded four pastoralists to attend the five-day BEHAVE workshop at Dubbo during August this year where Fred Provenza, Dean Revell and Bruce Maynard combined forces to explain more fully the theory and demonstrate the practical aspects of the BEHAVE principles. Those who attended the workshop came away with the understanding that grazing systems are highly complex and that there are multiple interactions going on between and within the soil, plant, herbivores and the people in control. By 'tuning in' to these interactions or feed-back loops, a manager can play a powerful role ensuring that everything is moving in the right direction. By not tuning in, a manager can block progress at best and at worst, accelerate land degrading processes and reduce livestock productivity. An effective means to 'tune in' to these processes is by close observations of animal behaviour and by using handling methods such as Stress Free Stockmanship, Low Stress Stockhandling or other similar methods based on the principles developed by Bud Williams.

An excellent range of material relevant to livestock producers can be found on the BEHAVE website at:

<http://extension.usu.edu/behave/>

Bruce Maynard's Stress Free Stockmanship and also the Low Stress Stockhandling website details are below.

<http://www.stressfreestockmanship.com.au/index.html>

<http://www.lss.net.au/>



*Bruce Maynard, discussing Stress Free Stockmanship with Damara sheep at Meka station*

# WATER PONDING ON LARRAWA STATION, NOVEMBER 2011

Matthew Fletcher<sup>A</sup>, Kevin Brockhurst<sup>B</sup>, Melanie McDonald<sup>C</sup> and Ray Thompson<sup>D</sup>

<sup>A</sup>Department of Agriculture and Food WA, Kununurra; <sup>B</sup>Larrawa station, Halls Creek WA;  
<sup>C</sup>Rangelands NRM WA, Broome; <sup>D</sup>Central West Catchment Management Authority, Nyngan NSW

On-ground works completed at Larrawa station producer demonstration site in 2011 focussed on building open water ponds and collecting data on their cost(\$) to construct. Water ponding is a proven regeneration technique developed in western New South Wales, acting/ helping to slow down overland water flow and increase infiltration, thereby increasing soil moisture available for plant growth.



Ninety ponds were built at Larrawa station in 2011. The amount of water ponded at each pond ranged between 10 cm and 15 cm. Data were collected on pond length, ponded height and time to construct. Two permanent Rangeland Condition Monitoring sites were installed. Two different sized machines (road graders) were compared; 16G and 12G. The model 16G grader is significantly larger and more powerful than the model 12G.

Data collected during 2011 indicated that a 16G grader was more economical at water pond construction than a 12G machine. Table 1 displays the median cost per metre and approximate cost to build a 210 m pond for both 16G and 12G machines.

Table 1 Data collected for a 16G and 12G grader

	16G	12G
Machine cost per hr (with operator and without fuel)	\$175.00	\$150.00
Diesel used per hour (litre)	22.5 L	22.5 L
Median cost to build pond per metre	\$.32	\$.49
Approximate cost to build 210 m pond	\$67.00	\$102.90

## Other costs

- Cost to construct a pond includes x2 rips along borrow area and x2 rips inside of pond.
- Cost of diesel was \$1.48/litre.
- Ferry of 16G to Larrawa from Kununurra was \$1000 each way (not included in above costs).
- Forage sorghum seed (Sprint) cost \$7.26/kg, approximately 2 kg used per ha.

The estimated cost to build two ponds on 1 hectare is:

- Surveying (not included).
- x2 ponds at \$67 each.
- 2 kg of forage sorghum seed was \$14.52.

Total cost is \$148.52 per hectare (construction, ripping and seeding).

Field observations where water had ponded were that the soil was spongy under foot and small cracks (2–4 mm) appeared after the subsurface clay layer had swelled and cracked.

It is expected that due to improved soil moisture retention and the creation of niches (cracks and groundcover) for seed capture and germination, recruitment of perennial grasses will occur over time. Perennial grasses growing outside the regeneration area which are expected to colonise within the regeneration area, are hard spinifex (*Triodia intermedia*) and buffel grass (*Cenchrus ciliaris*).

It was too early to make an assessment regarding financial return through increased stock numbers; able to be run post water ponding in April 2012. Due to an absolute lack of desirable perennial grass recruitment, no return on investment has been achieved thus far. It was cost prohibitive to purchase native perennial grasses to speed up recruitment, for example black spear grass (*Heteropogon contortus*) was quoted at \$115/kg (with no seed germination information available). Land managers are not permitted to plant buffel grass on crown land in Western Australia's rangelands. Further monitoring will be carried out after the 2013/14 wet season to measure change in perennial grass frequency.

Quantifying financial return from on-ground works in terms of community-wide benefits is challenging. Benefits from the demonstration so far are: increased groundcover protecting the soil from erosion; reducing sediment load flowing into King Sound (Indian Ocean) via the Fitzroy River, Christmas Creek and Lumbar Creek; biodiversity, both aquatic and non-aquatic, would also benefit with less sediment filling natural pools in creeks and rivers between the point of erosion until discharging into King Sound.



*Larrawa regeneration site No. 4, recorded no annual or perennial plants during site installation*

*At the time of reassessment in April 2012 all quadrats (25) at Larrawa regeneration site No. 4 recorded some annual groundcover. Pigweed (*Portulaca sp.*) provided the majority of groundcover recorded; Kimberley couch (*Brachyachne convergens*) and sprint sorghum (*Sorghum sudanense* X *Sorghum sudanense*) were also recorded on site. At the time of reassessment, no improvement in land condition was recorded, however an increase in groundcover was observed – attributable to increased soil moisture and a sign of improved ecological function.*



# MINING ACTIVITY ON PASTORAL LEASES IN WESTERN AUSTRALIA

*Jim Addison, Kalgoorlie*

Mineral exploration in pastoral areas is at present probably more widespread than ever before. Pastoralists at times become frustrated in their dealings with some members of the mining industry and are uncertain of how the requirements of both pastoral and mining stakeholders can be amicably negotiated.

To assist with this process two handy guides are available at the WA Department of Mines and Petroleum website at [www.dmp.wa.gov.au](http://www.dmp.wa.gov.au)

They are:

1. 'Prospecting, Exploration, Mining on Pastoral Leases'

The aim of this pamphlet is to provide a commonsense approach to prospecting, exploring and mining on pastoral leases whilst still conforming to the requirements of the *Mining Act 1978* in order to create a positive working relationship between the pastoral and mining industries.

2. 'Code of Environmental Practice for Mineral Exploration in Western Australia'

The Code aims to:

- propose desirable environmental management practices applying to mineral exploration activities
- promote a high standard of environmental performance by explorers operating in WA
- foster good relationships between explorers and those having a direct interest in the area being explored, e.g. pastoralists.

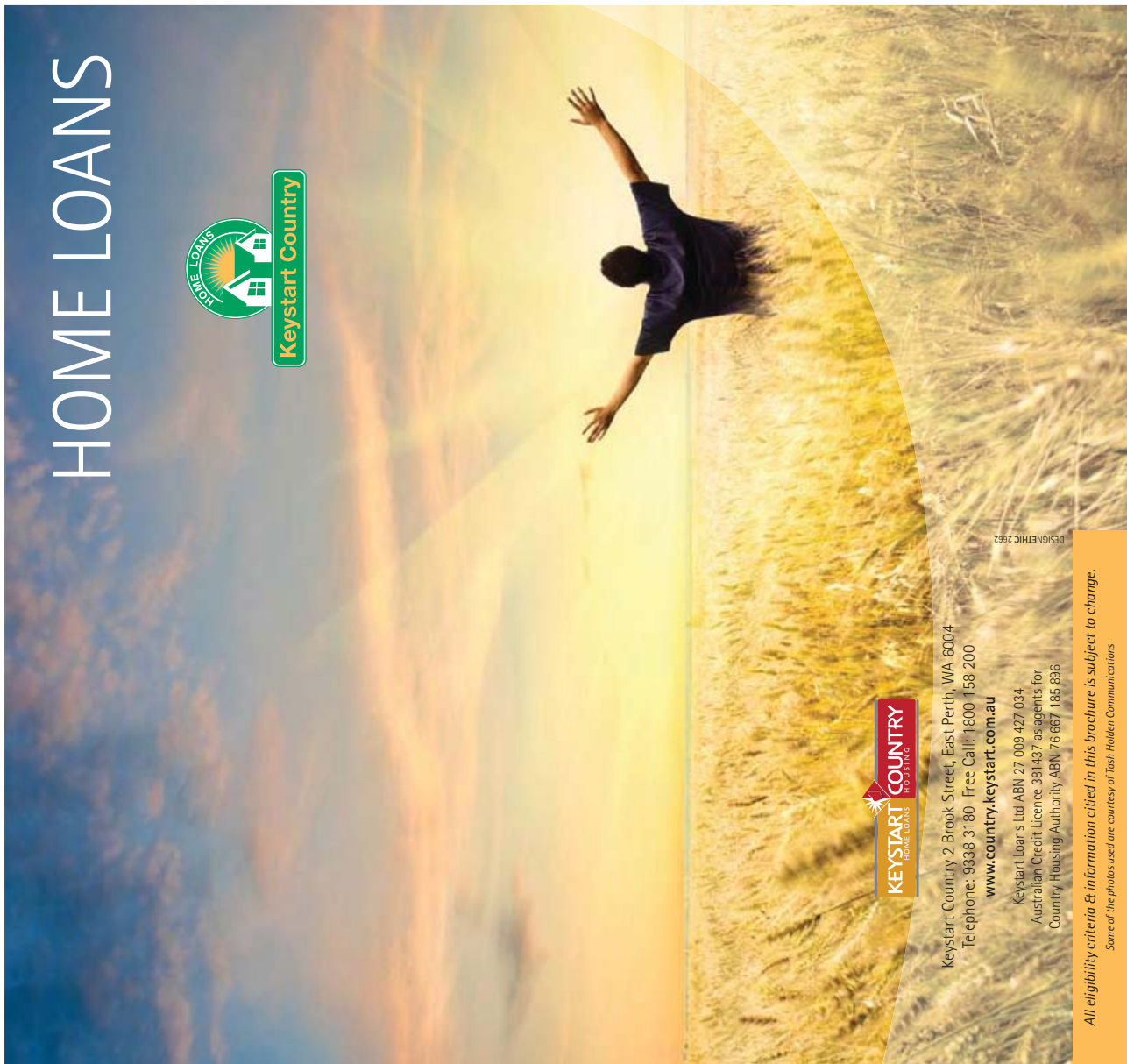
The Code is also available as a pocket version from the Association of Mining and Exploration Companies (AMEC) at [www.amec.org.au](http://www.amec.org.au)



*A non-active open-cut gold mine situated in the Northern Goldfields. Fairly typical of pits in the Mulga zone containing water suitable for livestock usage.*



# HOME LOANS



Keystart Country 2 Brook Street, East Perth, WA 6004  
Telephone: 9338 3180 Free Call: 1800 158 200  
[www.country.keystart.com.au](http://www.country.keystart.com.au)

Keystart Loans Ltd ABN 27 009 427 034  
Australian Credit Licence 381437 as agents for  
Country Housing Authority ABN 76 867 185 896

DESIGNETHIC 2862

All eligibility criteria & information cited in this brochure is subject to change.  
Some of the photos used are courtesy of Tash-Halden Communications

"Finally a loan  
that assists the  
needs of farmers,  
pastoralists &  
business owners".  
Free Call  
1800 158 200

*Thanks to the Keystart Country, our housing dream has become  
a reality. - Greg & Jasmine.*





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

## THE GOOD OIL — BEEF LINK

BEEF LINK is a new monthly news email connecting you to local and worldwide industry information relevant to all aspects of the beef supply chain and contains information relevant to both Northern Rangeland and Southern Agricultural regions. From pasture and grazing management to value adding in the processing sector, the latest production research to market trends and opportunities, BEEF LINK brings you the latest news, research and upcoming industry events delivered straight to your email inbox.

If you would like to receive BEEF LINK — delivered to your inbox, please email: [beeflink@agric.wa.gov.au](mailto:beeflink@agric.wa.gov.au) and ask to be added to the BEEF LINK email list.

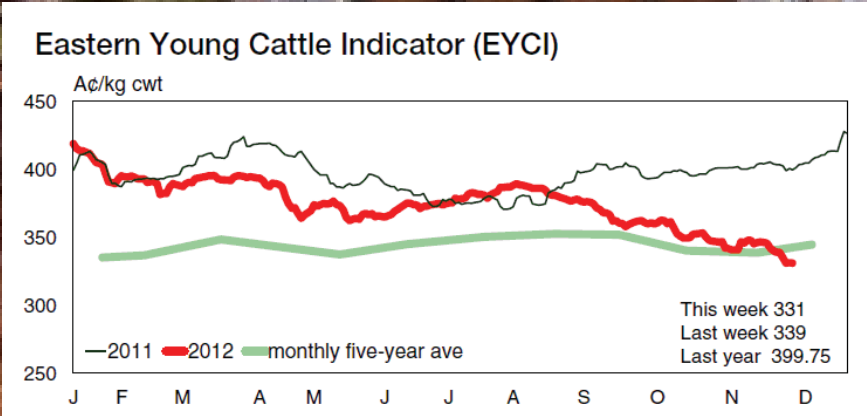
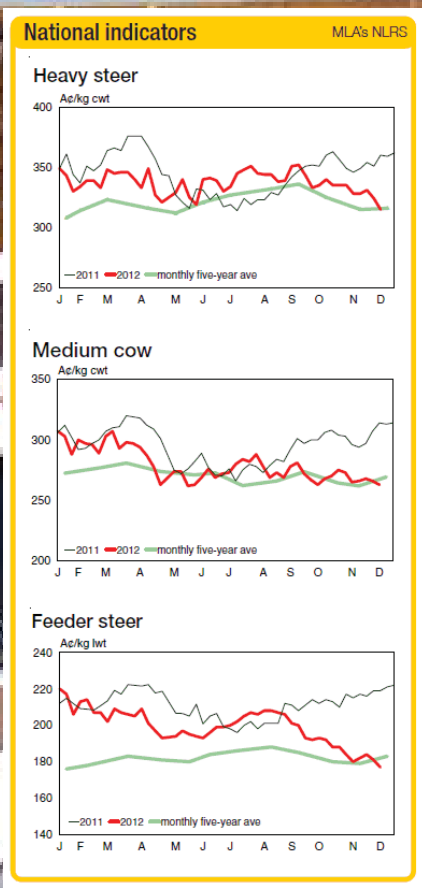
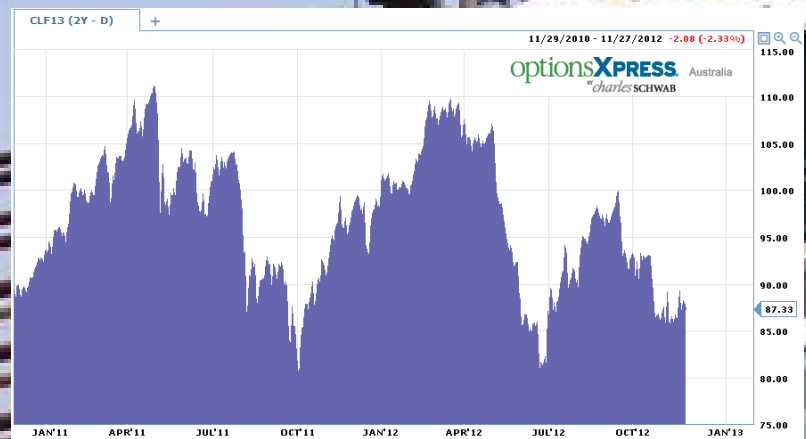
Previous editions of BEEF LINK can be viewed at: [www.agric.wa.gov.au/PC\\_95267.html](http://www.agric.wa.gov.au/PC_95267.html)

Department of Agriculture and Food  
 GOVERNMENT OF WESTERN AUSTRALIA

# BEEF LINK

BUILDING STRONGER SUPPLY CHAINS FOR WA BEEF

# CATTLE MARKET UPDATE – 30 NOVEMBER 2012



## Export numbers (Northern Ports in 2012)

- 17 797 head of cattle have left Broome Port between August and mid-December 2012.
- 6405 head of cattle have left Wyndham Port between August and mid-December 2012.
- Port Hedland Port—unavailable at the time of print.