Department of Primary Industries and Fisheries

Beeftalk

Taking stock of your future

Prime news and views for beef producers of south-east Queensland

Issue 27 Autumn/Winter 2009

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editorial

It would be fair to say that conditions in south-east Queensland are about average at the moment. Fortunately we are not suffering from the extreme weather conditions and devastation experienced in other parts of Australia. Over the past four to six week most of the area has had good grass rain, and some have been lucky enough to have dams filled. The moist humid conditions in February made it almost possible to 'watch grass grow'.

Unfortunately the downside to good rain is a proliferation of weeds, some of which we have never seen before. This edition of *Beeftalk* has a number of articles on weeds from information about specific weeds such as blue heliotrope and fireweed to more general articles on weed control.

Not too many days pass without mention of climate change, global warming and the problems of excess carbon in the atmosphere. Hands up those who are confused! Bill Schulke has written an article which attempts to unravel the confusion and put the whole issue in perspective. Make sure you read this article – it is the best information I have seen on the subject.

There are many opinions on the use of chemicals to control parasites on cattle and to control termites in farm buildings and yards. It is difficult to get anyone to give a definite answer on the chemicals that can be used lest they get sued. Articles in this issue discuss various aspects of chemical use and how chemical use can be reduced.

Jackie Kyte has finally decided to 'move on'. Jackie has been with the *Beeftalk* team for many years. She did a lot of the 'leg work' involved with producing the newsletter, keeping us on track, chasing up articles, and getting the layout right. A lot of this work has fallen on me so like many things in life I'm learning to appreciate what I had after it has gone. Jackie has set up her own events management business. Those of you who have attended MLA Beef Up Forums may have seen Jackie and her business partner Janine King keeping the show running. We wish Jackie well in her new venture.

Felicity McIntosh is back from maternity leave. We had the pleasure of Stephanie's (Felicity's baby) company at the last *Beeftalk* meeting – nothing like starting training early.

Let's hope the season continues as it has or, for those who have missed out, gets even better.

Please send in your feedback forms. The information you ask for guides our planning for articles in subsequent issues.

The Ed

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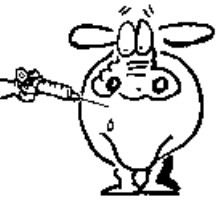
Why use 5-in-1 vaccine?

Key points

- Vaccinating your herd with a 5-in-1 vaccine prevents costly stock losses for around 35 cents a dose.
- A 5-in-1 vaccine covers five of the most common diseases caused by species of the toxin-forming *Clostridium* bacteria.
- A 7-in-1 vaccine may only be necessary if leptospirosis is an issue in breeding cow herds.
- Initially cattle should be given two vaccinations four to six weeks apart followed by a single annual booster.



Vaccines for botulism, three-day sickness (ephemeral fever), tick fever and pestivirus very clearly indicate the main purpose of the vaccine, but what do you get when you purchase a 5-in-1 vaccine?

5-in-1 vaccine is probably the most commonly used vaccine in the Australian beef industry. It's called '5-in-1' vaccine because it includes protection against five clostridial diseases found throughout Australia: tetanus, pulpy kidney (enterotoxaemia), gas gangrene (malignant oedema), blackleg and Black's disease.

Clostridial bacteria are very interesting. They survive as spores in the soil and only cause problems under certain conditions. The diseases themselves are not contagious between cattle but mini-outbreaks have occurred in certain instances. The diseases are usually fatal but can be readily prevented; prevention is far better than the cure.

Tetanus

Tetanus is caused by *Clostridium tetani* and occurs throughout Australia. The disease is not common in cattle. It is associated with deep penetrating wounds and wounds where the air is excluded (e.g. castration wounds associated with closure of the cut or application of an elastrator ring or Burdizzo castrator).

C. tetani multiply in anaerobic environments (i.e. no oxygen) and produce a deadly toxin. Initially an affected animal shows an anxious expression on its face, the third eyelid starts to cover the inside of the eye, and movements become stiff. Death usually follows.

This article is published courtesy of MLA's Frontier magazine.

Pulpy kidney

Pulpy kidney, or enterotoxaemia, usually occurs when the amount of carbohydrates in the diet increases substantially. It's most commonly seen when animals enter a feedlot but can also occur when animals go from a high roughage diet to a high digestible forage diet, such as lucerne or clovers.

Sometimes producers incorrectly believe that their animals are dying from bloat when they are actually dying from the toxin produced by *C. perfringens*, and vice versa. If animals die suddenly after grazing on lush pastures, it is important to establish the exact cause of the death as a 5-in-1 vaccine will not prevent deaths from bloat.

It is generally regarded as best practice to vaccinate all cattle destined for feedlots.

Blackleg

This is a disease that affects young, well-grown animals. Affected animals are usually found dead in the paddock.

The disease-causing organism, *C. chauvoei*, travels via the bloodstream and lodges in muscle groups that have undergone some internal tissue damage. It rapidly multiplies (in an anaerobic environment) causing a massive release of deadly toxin and further tissue damage.

Gas gangrene

Gas gangrene (or malignant oedema) is caused by *C. septicum*, which enters the animal after routine husbandry procedures such as castration and branding. Swelling and formation of gas under the skin are often associated with the infection. Treatment with appropriate antibiotics can be effective if the disease is diagnosed early enough. Cases of gas gangrene have been reported on properties north of the border between Queensland and New South Wales.

Black's disease

This disease is caused by *C. novyi* type B and is associated with liver fluke infestations. The migration of the liver fluke through the tissues of the liver establishes a traumatised anaerobic area where this organism can multiply.

Liver fluke have only been identified in isolated areas of south-east Queensland so this disease is of little concern to most producers.

Cost–benefit of 5-in-1

It is difficult to determine the extent of stock losses from clostridial diseases in beef herds because opportunities to monitor animals after husbandry procedures are limited and affected animals are often found dead, making the diagnosis difficult.

Nevertheless, 5-in-1 vaccine costs about $0.35/

dose. Any losses greater than 0.1 per cent (i.e. 1 out of 1000) prior to vaccination would mean that vaccination at branding would be one of the most cost-effective health programs you could employ in a cattle breeding enterprise.

Another way to help reduce losses from clostridial diseases would be to adopt best practice standards for routine husbandry practices such as castration and branding. A manual outlining these procedures, *A guide to best practice husbandry in beef cattle*, is available free from www.mla.com.au or by phoning MLA publications on 1800 675 717.

A large percentage of turnoff cattle now ends up in feedlots either in Australia or overseas, which is further good reason for implementing a sound vaccination program by administering 5-in-1 vaccine to calves.

What about 7-in-1 vaccine?

7-in-1 vaccine is a 5-in-1 vaccine that has been combined with two strains of leptospirosis vaccine. Leptospirosis is a contagious bacterial disease that affects young calves and breeding females, causing stillbirths and abortion in late pregnancy. It should be used on breeding females and replacement heifers where a problem is known to exist. Male cattle and cull heifers will not need to be vaccinated with this product. It is much more expensive than the 5-in-1 vaccine so its use should be targeted to reduce costs.

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Wiregrass – Aristida species

There are over 40 species of wiregrasses in southern Queensland. Belonging to the genus Aristida, they are all similar and are all native. Wiregrasses, as the name suggests, are unpalatable and unproductive hard-stemmed grasses with little green leaf.

The larger species can grow up to one metre high, but most are shorter. The key identifiable feature of wiregrasses is the seed head. The seed varies in size but has a sharp barbed point and the tail has three awns. Anyone who has walked through a paddock will have experienced the seed in their socks. Other common names include three-awned speargrass and white speargrass.

The proportion of wiregrass plants in a pasture is a key indicator of pasture condition. As a native plant it is common to most native pastures, but it seldom makes up more than 5% of a healthy native pasture. Generally, the proportion of wiregrass increases under conditions of heavy grazing as cattle eat out other forage in preference. Lack of fire can also result in increased wiregrass density. Whatever the contributing factors may have been, a pasture dominated by wiregrass is in poor condition.

Reducing the incidence

Work carried out at Brian Pastures Research Station showed that burning reduced the proportion of wiregrass and other undesirable grasses such as pitted bluegrass (*Bothriochloa decipiens*) and slender chloris (*Chloris divaricata*). Burning reduced the density of wiregrass initially by reducing tussock size and later by reducing tussock numbers.

At the same time, burning combined with reduced grazing pressure in at least three consecutive years improved the density and vigour of desirable native species such as black speargrass (*Heteropogon contortus*) and forest bluegrass (*Bothriochloa bladhii*).

Results of this work and subsequent trials on commercial grazing properties demonstrated that spring burning following 25–50 mm of rain, combined with grazing management, will restore pasture composition and land condition.

Many people ask about slashing to reduce wiregrass. Slashing may allow more favourable species to return, but it will be necessary to spell the pasture. It is doubtful whether slashing would reduce the wiregrass population as effectively as fire. Even more doubtful is the economic viability. In situations where slashing is an option (higher rainfall, accessible country), establishing a sown pasture will probably be a better option as it would be more likely to provide viable and sustained results.

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Post-weaning diarrhoea

Post-weaning diarrhoea (PWD) is a very common condition in weaned calves. It is mainly caused by two coccidia (*Eimeria bovis* and *E. zurnii*) that normally inhabit the intestinal tract. Cattle contract these organisms from herdmates within a day of birth.

Under normal circumstances, coccidia cause no significant problems as the cattle develop an immunity that keeps the coccidia populations suppressed. However if the immune system in a calf's gut is compromised, the parasite can reproduce rapidly and cause substantial damage to the lining of the intestines. This is expressed as bloody or black diarrhoea.

Weaning is a very stressful time for a calf and this stress can cause the immune system to be compromised, allowing these coccidia to build up. The immune system in the intestinal lining requires a constant flow of digesta. Interrupting the feed supply to weaned calves for as little as one day can compromise the gut's immune system and precipitate coccidiosis. Usually clinical disease will become apparent about four weeks after the time when the immune system was suppressed.

The parasite usually damages its own environment to the extent that it no longer has a suitable environment in which to successfully reproduce. At this point intestinal populations of coccidia decline rapidly and the disease regresses. In other words, the disease is typically self-limiting, but unfortunately not before damage has been done.

If an affected calf is not given drugs to control the parasite, it may continue to suffer chronic intestinal damage from coccidia. If left untreated, the intestine can be scarred, which may affect long-term growth.

These strategies for managing PWD are recommended:

- Ensure calves have access to nutritious palatable feedstuffs to satisfy voluntary feed intake from the point of weaning. This can be done by putting good quality hay in the weaning yard on the day calves are weaned.
- Reduce the stress of weaning as much as possible. Give calves access to warm dry yards with shade and a plentiful supply of clean water.
- Include a coccidiostat in the calves' rations. Rumensin™ (active ingredient monensin) is a commercially available product commonly used in calf rations. It should be added to achieve an intake of approximately 25 mg/head/day. Rumensin™ may also help control an outbreak of PWD. Take care when using this product: over-dosing in cattle is quite toxic, and in horses even small amounts can be lethal.
- In calves that suffer severe or chronic PWD, treat individually with Scourban™ (which cattle vets can prescribe), a product that includes a coccidiostat, an antibiotic and anti-diarrhoeal powders.

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Bovine ephemeral fever – is it changing?

Cattle producers have been reporting that bovine ephemeral fever (BEF) is becoming more severe, both in terms of the number of cattle affected and the number of mortalities.

This is supported by reports of atypically severe forms of the disease during the January 2008 floods in the Belyando River region.

DPI&F and the Australian Animal Health Laboratory investigated the Belyando outbreak. The strain of BEF virus in one sample appeared to be different from those identified as circulating in Australia up until 1992, which includes the current vaccine strain which was isolated in 1968.

To investigate this possible change in the virus, staff at the Department of Primary Industries and Fisheries require blood samples from animals that have been affected by the disease. Blood samples from BEF outbreaks forwarded to DPI&F veterinary laboratories will be cultured for the virus free of charge.

There is considerable interest within the industry for developing a new generation BEF vaccine. Ideally this vaccine would be delivered as a one-dose product and include currently circulating BEF viruses in its formulation.

Herds from which blood samples have been received for BEF analysis will be potential candidates for any future vaccine development work taken up by outside laboratories.

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Look out for fireweed

Autumn is an ideal time to look for fireweed in pastures. Fireweed is an exotic weed that competes with pasture and is toxic to livestock. Poisoning from fireweed results in slow growth and poor condition in cattle and can result in death.

Fireweed is generally unpalatable to cattle, so poisoning is most likely to occur where there is a shortage of pasture or where fireweed is dense and cattle are less able to graze selectively.

Reduced ground cover due to overgrazing, fire, drought, slashing and pasture renovation and establishment will favour fireweed establishment. Fireweed infestations are usually worse where pastures have been neglected and fireweed spread has not been controlled. Fireweed can eventually dominate pastures.

Manage

Dense pasture cover in autumn is the best approach to fireweed control because this will help prevent the weed from becoming established in the first place. To manage for autumn ground cover:

- Manage stocking rates to avoid overgrazing.
- Use fire strategically such as by considering seasonal forecasts and burning in spring when appropriate.
- Avoid slashing pastures in autumn.
- Avoid renovating or sowing pastures in late summer or autumn.
- Use fertiliser strategically to lift pasture vigour in late summer and early autumn.

Identify and act

The best time to look for fireweed in your pasture is early autumn before the weed has the chance to flower and seed. Act immediately when small infestations of fireweed are identified to prevent the situation from becoming worse.

Fireweed closely resembles a number of native daisy-like plants so identification can be difficult. Compare with the DPI&F Pestfact photos and ask your local weeds officer if you are still unsure.

Fireweed is generally an annual, but some plants survive through summer so plants of all ages can be present in affected pastures. Most seedlings appear between March and June and grow quickly to produce flowers within six to ten weeks. Even light infestations of fireweed can produce 1 000 000 seeds per hectare.

Fireweed plant and flower

Seeds are light and can be carried by wind but also can cling loosely to animals. Fireweed can be spread short distances by wind and stock, and longer distances with pasture seed, hay, turf, mulch and stock transport.

Fireweed is established in pastures along the entire New South Wales coast and in south-east Queensland south of Brisbane. Isolated infestations have been found as far north as Gympie. Fireweed is spreading northward and has the potential to infest extensive areas of grazing land as far north as Rockhampton.

Control

Control of fireweed with herbicides is most effective if carried out before plants reach maturity. Several herbicides are currently registered in Queensland for the control of fireweed and information about these is available on the DPI&F fireweed Pestfact.

Isolated plants and very light infestations can be removed manually. Fireweed is toxic (even when dry) so wear gloves when handling it and bag and dispose of removed plants appropriately.

Slashing is not usually effective for controlling established plants, and can actually increase stock poisoning risks and provide an opportunity for new plants to establish.

Further information is available from local government authorities, DPI&Fs land protection officers or online at www.dpi.qld.gov.au/biosecurity and click on Weeds and Pest Animals.

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Halt the spread of weeds

Unfortunately very few properties are weed free. Weed infestations can range from a small patch of a single species to large infestations of multiple species. Because weed seeds spread easily – being carried by wind, water, vehicles and machinery, people and stock feeds – keeping a property free of weeds can be a significant challenge.

Here are a number of basic procedures to halt weed spread:

1. Restrict the movement of vehicles on your property. Convey visitors around your property in your vehicle, not theirs.
2. Ensure that any machinery coming to work on your property is clean. Most local authorities have vehicle wash-down facilities for cleaning vehicles between properties. Request written assurance, such as a Weed Hygiene Declaration, that vehicles and machinery are clean.
3. Request a Weed Hygiene Declaration when purchasing feed or seed.
4. Establish designated feeding stations around your property and monitor plant growth in these areas.
5. Quarantine new livestock for at least five days in yards or a small holding paddock before letting them out into large paddocks.
6. Keep access roads, easements and yards weed free. The old saying 'a stitch in time saves nine' is very appropriate for weed control.
7. Maintain good land and pasture condition for effective weed control. (See the article on non-chemical weed control in this edition of *Beeftalk*.)

A Weed Hygiene Declaration provides information on the weed contamination status of a 'thing' (fodder, grain, gravel, machinery, mulch, packing material, sand, soil, stock, vehicles and water). If contaminated, the receiver can either refuse the thing or take precautions to prevent new weed infestations.

A Weed Hygiene Declaration also satisfies the legislative requirement to give written notice when supplying a 'thing' that is or could be contaminated with any of these Class 2 declared plants:

- Parthenium (*Parthenium hysterophorus*)
- Prickly acacia (*Acacia nilotica*)
- Giant rat's tail grass (*Sporobolus pyramidalis* and *S. natalensis*)
- American rat's tail grass (*Sporobolus jacquemontii*)
- Giant Parramatta grass (*Sporobolus fertilis*)
- Parramatta grass (*Sporobolus africanus*)

Weed Hygiene Declarations are available from the DPI&F website under

Biosecurity>weeds, pest animals & ants>weeds>preventing weed spread

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MSA – Is it for you?

The MSA grading system for accurately identifying the eating quality of beef has been described as one of the best such grading systems in the world.

It's worth asking whether producing for an MSA market is a viable option for your beef enterprise:

- What is it going to cost to meet the new market specifications?
- What will be the extra return?
- Can I physically handle any changes in management?

For your cattle to be graded MSA, you may have to

- reduce *Bos indicus* content (for a lower hump height)
- not use HGPs
- change management
- possibly use production feeding to increase growth rates.

All these factors have an impact on the property management and finances beyond the turnoff cattle and will need to be considered.

Some producers register as an MSA producer but elect to maintain their normal management practices. When they consign cattle they consign them to be graded for MSA. Carcases that receive an MSA grade may attract a premium. If no MSA grade is received, no extra cost has been incurred.

You will need to know the carcase specifications of this 'new' market as well as the processor's

requirements as these may differ. Even though a carcase receives an MSA grade, the processor may not pay a premium if some specifications fall outside their requirements.

There has never been any feeding restriction on carcasses presented for MSA grading, but there has been a belief that animals had to be grain fed to meet the age (ossification) and weight requirements. The current emphasis on 'grass-fed' MSA is simply to encourage producers to consider the option of targeting an MSA market with cattle that are grass fed.

Handling cattle to be graded for MSA

Not surprisingly, the MSA grading system developers found that reducing the stress on the animals as much as possible prior to slaughter increased the eating quality of the meat. Hence the guidelines for handling cattle destined for MSA grading are aimed at reducing the stress on the animal prior to slaughter. This should be the aim of every producer irrespective of the destination market. In most cases producers will not need to change their cattle handling procedures.

One change producers may need to implement is to avoid mixing cattle from different mobs or properties in the two weeks prior to consignment. Cattle from mixed mobs will experience increased stress while they sort out a new pecking order.

To register as an MSA producer

Obtain an MSA registration form by phoning 07 3620 5200 or going to the MLA website www.mla.com.au and clicking on Meat Standards Australia in the column on the right hand side of the screen. Return the completed form by fax to 07 3620 5250 or post to PO Box 2363, Fortitude Valley BC Qld 4006.

You will be allocated an MSA producer registration number and MSA vendor declarations. Once you receive these, you can consign cattle through the MSA system.

When consigning cattle to be graded for MSA, you must complete both a National Vendor Declaration form and an MSA vendor declaration form. Information on these forms is used by the MSA graders when assessing carcases.

Feedback

Once you have consigned cattle to be graded in the MSA system it is important to study the feedback sheets to understand how each animal was graded. This will show you where changes need to be made if you wish to increase the percentage of animals receiving a favourable grading.

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MSA grading factors

Boning group

When a carcase is presented for MSA grading, a number of measurements are taken. These measurements are entered into a computer program which calculates the final boning group score. Boning group scores range from 1 to 18 with 1 being the ultimate score (and best quality).

MSA grading measurements

***Bos indicus* content...** The producer declares (estimates) the *Bos indicus* content on the MSA permit when consigning cattle, and this content is determined/verified by a measure of the hump height on the carcase. A higher *Bos indicus* content will result in a poorer boning group score.

Ossification (age)... This is the conversion of cartilage to bone in the spine of a carcase. MSA trials showed that the amount of ossification in the spine of a carcase more accurately indicated an animal's age – so far as meat eating quality is concerned – than the eruption of permanent teeth. The score ranges from 100 (no ossification) to 590 (where almost all the cartilage is ossified). The faster an animal grows to a particular weight, the lower its ossification score will be at this weight.

HGP... Using HGPs will increase growth rates, but it also increases the boning group score. It doesn't matter how many times the animal has been implanted, if it has been implanted at all the carcase gets the HGP rating which will downgrade its boning group score.

pH... The optimum pH range is from 5.3 to 5.7. A carcase with pH outside this range will fail to grade MSA. Stress is an important factor; carcases from animals that are very stressed prior to slaughter may have an unacceptable pH.

Marbling... Distribution and amount.

Meat colour... Meat colour ranges from 1a to 7. MSA-graded meat can be from 1b to 3. 1a is considered to be too light a colour; above 3 the meat is too dark.

Rib fat... A minimum of 3 mm is required for a carcase to be graded MSA. Individual processors may require more fat to meet their specifications.

Hanging method... Carcases hung by the Tenderstretch method will achieve a more favourable MSA boning group score.

Carcase weight... Good weight for age animals score best.

Ageing... The MSA grading program will advise the wholesaler/retailer whether aging will improve the eating quality of a particular cut.

Low chemical and organic control of cattle parasites

Most Queensland beef producers are seeking to minimise or optimise the use of chemicals in their production systems and, in particular, in pest and parasite control. Reasons include to reduce selection for resistance in parasite populations, minimise the likelihood of residues, decrease operator exposure to pesticides, and reduce costs.

Some producers are also seeking to access markets for organic beef. In this case, restrictions apply to the use of all artificial chemicals for all purposes, not just pest and parasite control. For organic production, formal accreditation through a certifying body is required and beef producers seeking to become organically accredited should consult National Standard for Organic and Bio-Dynamic Produce (available from the Federal Department of Agriculture Fisheries and Forestry website) or one of the accredited organic industry organisations for requirements.

Parasitism is a major reason for the application of chemicals to livestock and for this reason many of Queensland's organic beef enterprises are located in extensive grazing areas where parasites are rarely a problem.

The main parasites of cattle in Queensland can be divided to external parasites, such as cattle tick, buffalo flies and lice, and internal parasites, mainly gastrointestinal 'worms' and flukes. Most of these parasites are limited to the higher rainfall areas of Queensland although they can sometimes cause problems in dryer areas in wet years. Problems with worms are generally limited to young stock because cattle usually develop strong immunity to worms after about 12 to 18 months of age. The occurrence of flukes is localised and associated with grazing wet or marshy areas where the intermediate host snail is present.

Low chemical controls

People often think of low chemical parasite control as an organic or biological parasiticide that can simply be substituted for a chemical pesticide. It is rarely this simple. Effective low chemical control programs almost inevitably rely on:

- a well-planned, integrated approach that incorporates management practices to reduce parasite numbers or exposure to parasites
- the selection of resistant stock, and
- sometimes the use of organically accredited parasiticides or biopesticides.

Management approaches to reduce the impact of parasites

Good nutrition and low stress. Cattle mount an immune response to the presence of parasites and in most cases this limits the impact of the parasites. The effectiveness of these immune responses is influenced by nutrition and stress. Providing good nutrition and a low stress environment will maximise the animal's ability to resist parasites. Nutritional supplements and mineral blocks are often indicated as assisting in parasite control. With the exception of copper and its effect on barbers pole worms, there is little good evidence to indicate that specific nutrients help resist parasites when cattle have good nutrition. However, nutritional supplements may help reduce susceptibility to parasites where nutrients are deficient.

Grazing management: Cattle become infected with worms by ingesting free-living worm larvae from contaminated pasture. These larvae hatch from eggs that are produced by the adult worms living in the cattle gut and which are deposited on the pasture in cattle faeces. Continually grazing young animals in the same paddocks contributes to worm build up and increases worm challenge. A key non-chemical means of controlling worms is to minimise the pick up of worms by providing uncontaminated pasture for young stock. This can be done by spelling pasture to allow the worm larvae to die off before they can infect young cattle, or by providing pasture in paddocks such as cropping paddocks or stubbles that have not recently been used for grazing cattle. Using resistant mature cattle to 'mop up' worm larvae in paddocks after they have been grazed by young cattle helps to clean a paddock of worm larvae. Grazing young cattle together with older stock or other livestock species that are not good hosts for cattle worms can also dilute the worm challenge to young stock. The worst situation for worm challenge is to continually graze young stock in the same paddock year after year.

Spelling paddocks can also reduce tick contamination. Although tick larvae can survive

on pasture for up to 7 months, in most areas spelling for 4 months is sufficient to reduce numbers to low levels.

For flukes, the most effective non-chemical control is fencing off or avoiding grazing swampy wet areas where intermediate host snails live. Some producers have reduced stock exposure by draining or revegetating these areas and providing watering troughs away from the risk areas.

Pasture species: Worm larvae seldom move more than 5 cm up into the pasture, so reducing stocking rates so that animals do not have to graze close to the ground can reduce worm burdens. Grazing young/susceptible animals first while the pasture is longer can also help reduce burdens. Young cattle can be followed by more resistant mature stock to clean up the pasture residue and 'mop up' the worm larvae.

Selection and breeding: Within a herd it is common to find individual animals that regularly have high parasite numbers. Such animals continue to provide a source of pasture contamination for worms and ticks or infestation for other herd animals in the case of buffalo flies and lice. Cull these animals if possible. Some particularly sensitive animals react strongly to buffalo fly bites and may develop open lesions even when fly numbers are relatively low. These animals should also be culled.

Much of the observed variation in susceptibility to parasites, both between and within breeds, has a genetic basis. Zebu breed types and their crosses generally have lower susceptibility to parasites than British breed types, but there is also significant genetic variation within breeds.

Dung beetles: Active populations of dung beetles rapidly break down dung pats, reducing buffalo fly breeding habitat, reducing worm larvae hatching and aiding in worm control by reducing pasture contamination. Artificial parasiticides can reduce dung beetle breeding but low-chemical systems should have little or no detrimental effect.

Buffalo fly traps: Walk-through buffalo fly traps can be a very effective non-chemical control when placed where cattle will walk through them frequently, for example when accessing water.

Farm biosecurity and quarantine: One of the most common ways to get parasites, particularly lice or resistant worms and ticks, is to import them onto the property on purchased or agisted stock. New animals should be quarantined from the rest of the herd to reduce the risk of infecting other stock. Lice are obligate parasites and spread almost exclusively by direct contact between animals. If lice are found in the herd, reduce their spread by avoiding contact between the infested group and other cattle.

Vaccine: A commercial cattle tick vaccine (Tickguard Plus®) is available (although not currently on the market) and can be used to aid cattle tick control in low-chemical systems. For organic farms the situation is less clear cut. The use of vaccines is restricted and clarification should be sought from the accrediting body on a case by case basis. Research towards an improved vaccine is currently underway at the Beef CRC.

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Organic production systems and severely parasitised animals

Clearly, leaving animals untreated where animals are under stress from parasites and no effective organically accredited treatment is available is unacceptable from a welfare perspective.

Most organic accreditation systems provide for the use of non-organic accredited compounds to treat animals under stress from parasites without compromising the overall accreditation of the property. These provisions usually include conditions that the treated animals:

- are removed from organically accredited land
- do not come into contact with other animals in the herd, and
- must not be sold into organic markets.

Producers should check with their accrediting body for specific guidelines on how to deal with heavily parasitised animals.

It should also be noted that all commercially sold parasiticides, whether organic, biological or synthetic chemicals, must be registered before they can be legally applied to food animals. The APVMA considers that a product is likely to require registration if any claim is made on a label, advertisement or website that the product is intended to modify the health, production, performance or behaviour of animals.

For full details on what constitutes a veterinary chemical product contact the APVMA:

Postal: APVMA, PO Box 6182, Kingston, ACT 2604
Phone: 02 6210 4700
Website: www.apvma.gov.au/about_us/contact.shtml

Hardwood plantations

How can they be a part of your beef enterprise?

The Queensland Government is moving towards plantations to provide a sustainable hardwood timber resource and reduce the reliance on native forests for hardwood timber production.

To meet these objectives, Forestry Plantations Queensland (FPQ – formerly DPI Forestry) aims to establish 20,000 hectares of hardwood plantations by 2015.

FPQ is a statutory corporation that manages approximately 190,950 hectares of softwood and approximately 10,815 ha of hardwood plantations, as at June 2008. The corporation is a leader in subtropical hardwood (native eucalypt) plantation establishment and management and is expanding the hardwood plantation estate by approximately 1,500 hectares per year in targeted localities within south-east Queensland.

FPQ's hardwood plantations are established on State Plantation Forest, Crown freehold, and private lands through rental and joint venture agreements.

To support its growing hardwood plantations, FPQ is particularly seeking new relationships with landholders wishing to rent their land for plantation establishment. Existing private landowners or investors are welcome to be involved in growing native hardwood plantations for sawlog production.

Participants in the program are paid a quarterly indexed rent in advance in return for access to their land. It takes 25 years to produce a hardwood sawlog crop and an agreement is established with the participant (a profit-a-prendre agreement) that legally separates the tree crop from the land.

What's in it for participants?

Hardwood plantations offer:

- immediate and ongoing returns through regular land rental payments indexed to the Consumer Price Index
- income diversification
- a secure investment based on FPQ's forest management expertise and sound research base
- integrated cattle grazing and timber production
- profits from under-utilised land
- environmental benefits such as soil stabilisation, improved water quality and salinity amelioration
- carbon sequestration and climate control.

What type of land is needed?

- to be considered for FPQ's hardwood plantations, land needs to be located in south-east Queensland, roughly in an area between Miriamvale in the north, south Burnett in the west and the New South Wales border (see map), although there are preferred locations within this broader area
- already cleared
- suitable soils, slopes and positive drainage
- greater than 30 plantable hectares (74 acres)
- needs to be maintained stock free during the initial establishment phase (up to 2 years).

Investment opportunities

Opportunities may also exist for investors or landowners to invest in hardwood plantation development for a share of the timber resource. These options can be discussed with FPQ's plantation development officer.

For more Information, contact:

FPQ Hardwood Plantation Development Officer
Beerburrum Forestry Office
Red Road, Beerburrum Qld 4517
Phone: 07 5438 6653
www.fpq.net.au

Effective lice control in cattle

Biting and sucking lice significantly irritate cattle, triggering them to bite, scratch and rub. Infested cattle will rub against fences, buildings, yards, trees and other fixtures, reducing hide and carcass quality. Heavy lice infestations can also lead to decreased growth rates and body condition. The economic impact associated with poor presentation in the saleyards and reduced hide value at slaughter can be high.

The coats of lousy cattle look rough and scruffy and areas of skin may be rubbed raw. This is not consistent with on-farm quality assurance programs, such as Cattlecare.

Biting and sucking lice are spread entirely by direct contact between cattle.

Louse eggs remain dormant through the warm summer months and begin hatching with the onset of colder weather. Lice populations reach a peak during winter when the dense winter coat and cool weather provides the ideal breeding environment. The declining plane of nutrition often experienced on winter pasture can lead to a decrease in body condition and this can also be associated with a rapid build-up of lice numbers.

In areas where lice are known to be a problem, it is best to start treatment in autumn (May) before lice populations start to build.

When selecting a lice-control product from the numerous insecticides on the market, consider the product's length of action against lice. Using a longer-acting product will reduce the likelihood of needing to retreat later in the season, significantly reducing labour and mustering costs.

It is important to treat all cattle on a property at the same time, adhering to the manufacturer's instructions for application. Following treatment, cattle should be returned to a paddock that has been cattle-free for at least a week. To prevent re-infestation, ensure the treated cattle have no contact with other cattle, even across fences.

Shorter-acting products may require a follow-up treatment 3–4 weeks later. Longer-acting products should only require one treatment in autumn for effective lice control through the winter.

Further information:

Jane Morrison *Technical Advisor–Livestock, Coopers Animal Health*
Phone: 0419 402 001
Email: jane.morrison@sp.intervet.com

Australia's carbon pollution reduction scheme – *implications for the beef industry*

We are all aware that the Federal Government announced, at the end of last year, a Carbon Pollution Reduction Scheme (CPRS) to reduce Australia's greenhouse gas emissions. Agriculture, though exempt from the initial start-up year of 2010, is a significant player. The grazing industries have the largest potential liability, with the least room to move, of all agricultural industries. Paradoxically, the grazing sector also has the greatest opportunities in providing carbon offsets either internally or externally to other emitting sectors. Meeting obligations under a CPRS poses the greatest challenge to the grazing industries for the next decade.

In light of the growing scientific, public and political concern surrounding climate change, the Federal Government commissioned Professor Ross Garnaut to investigate the economic impacts of climate change and actions required to reduce greenhouse gas emissions. The CPRS is largely based on Professor Garnaut's findings.

Australia's emissions

In terms of total global emissions, Australia is about the 12th heaviest emitter producing (in 2006) about 550 Mt CO_2 $^{-e}$ (mega tonnes of carbon dioxide equivalent) or about 1.4 per cent of global emissions. Whilst we are a long way behind countries like USA and China in terms of total emissions, on a per capita basis we are the 3rd heaviest emitter.

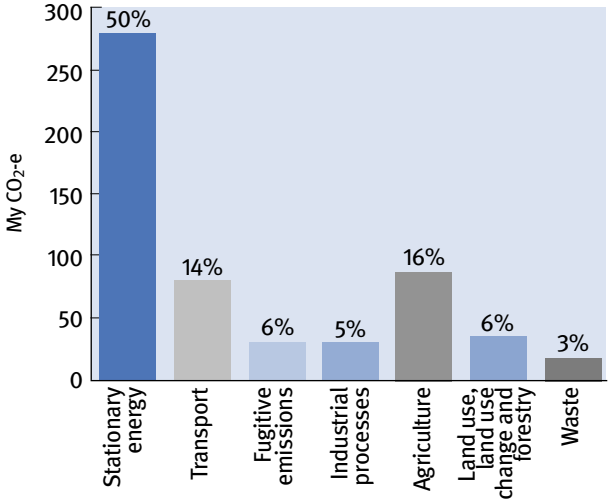


Figure 1. Australia's emission profile (Source: Greenhouse Office)

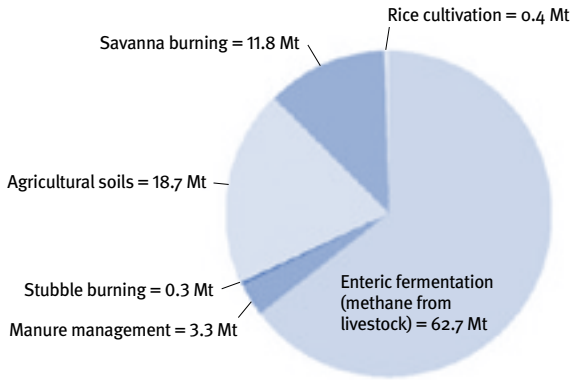


Figure 2. Greenhouse gas emissions from Australian agriculture in 2003. (Source: Greenhouse Office)

Stationary energy (electricity) is the largest emitting sector in Australia, producing about half of our total emissions. Agriculture and transport are the next two largest emitting sectors at 16 per cent and 14 per cent respectively (Figure 1).

Within the agricultural sector (Figure 2), methane production from ruminants is the largest emission source at about 62.7 Mt CO_2 $^{-e}$, with savannah burning also significant at 11.8 Mt CO_2 $^{-e}$. The grazing sector accounts for about 12 per cent of all Australia's emissions but contributes less than 1.3 per cent to GDP. It is the grazing industries that have the largest emissions liability.

Emission reduction targets and the CPRS

The Federal Government has set emissions reduction targets for the mid and long term. They propose an emissions target for 2050 that is 60 per cent lower than emissions in 2000: about 210 Mt CO_2 $^{-e}$ per year (down from the 2000 level of 525 Mt CO_2 $^{-e}$).

The interim target for emissions in 2020 is between 5 per cent and 15 per cent lower than the 2000 levels. The 15 per cent reduction (about 446 Mt CO_2 $^{-e}$ annual emissions) applies if the rest of the world agrees to similar schemes; the 5 per cent reduction (about 499 Mt $CO2$ $^{-e}$) applies if Australia acts alone.

To achieve these reductions, the Federal Government will introduce the CPRS as a cap and trade scheme (text box 1). The 'cap' means that there will be a limit to emissions and the 'trade' means that polluting industries can buy or sell the right to pollute up to the level of the cap. The CPRS will commence from 2010.

Including agriculture

Professor Garnaut highlighted the problems of including agriculture in a CPRS. The major issues include:

- the large number of commercial entities (several hundred thousand versus one thousand or so for energy, transport and waste),
- lack of accurate or effective means of measuring gross and net emissions at the enterprise scale, and
- problems with the current rules for accounting under the Kyoto Protocol.

Following his recommendations, the Federal Government has opted to exempt agriculture from the initial start-up. From 2009 until 2013, the Government will investigate the feasibility of including agriculture in the CPRS. If feasible, agriculture will be included from 2015. If it is not feasible to include agriculture at that stage, then the Government will consider Garnaut's suggestion of downstream point of obligation payment:

'For example, under the New Zealand emissions trading scheme, a point of obligation further downstream is being considered for a subset of agriculture emissions—such as covering emissions from enteric fermentation and manure management through a point of obligation at the dairy or meat processor.' (Garnaut 2008).

Implications for the beef industry

Implications for the beef industry are many and varied, and somewhat speculative at this stage. The implications are slightly different depending on whether agriculture is included in the scheme from 2015 or not.

Regardless of agriculture being included, some impacts will be felt from 2010. Generally, all agricultural industries can expect an increase in input costs as the other polluting sectors meet their obligations under the CPRS. These sectors will have to cover the cost of purchasing and surrendering emission permits, make production changes to reduce emissions, and/or invest in carbon offsets. In a practical sense the cost of electricity, transport, fertiliser and (to a lesser extent) water will potentially all increase. An additional impact will be increased slaughter costs as the processing sector meets their obligations. For Australia's northern beef industry, increases in transport and slaughter costs will have the largest impact.

If agriculture is included in the CPRS (either on a compulsory or a voluntary basis) individual enterprises will need to meet obligations under the CPRS. These included measuring annual emissions (and potentially offsets), purchasing emission permits, completing annual 'carbon accounts' and surrendering permits in accordance with the rules of the scheme. There is also the potential to trade permits or provide offsets for other sectors (i.e. provide carbon sinks).

Potential costs to individual enterprises include:

- financial (permit purchase, accounting/admin costs, non-compliance penalties)
- managerial costs associated with developing skills to measure and account for emissions and offsets, or using third party providers to do this
- adaptation costs associated with abatement of emissions.

If agriculture is not included in the CPRS, or if individual enterprises opt not to be included, then emissions reduction will be achieved via a point of obligation payment at some level in the chain, most likely the processor level. This will entail a cost to the processor that will either be passed back down the chain to the producer or up the chain to the retailer/consumer, or both.

The implications of costs being passed back to the producer are obvious (less income). The implications of passing the cost up the chain include a shift in consumer purchasing habit toward protein sources

TEXT BOX 1

Mechanics of a cap and trade scheme

- Emitters of greenhouse gases need to acquire a permit for every tonne of greenhouse gas that they emit.
- The quantity of emissions produced by firms will be monitored, reported and audited.
- At the end of each year, each liable entity will need to surrender a permit for every tonne of emissions that they produced in that year.
- The number of permits issued by the Government in each year will be limited.
- Firms will compete to purchase the number of permits that they require. Firms that value the permits most highly will be prepared to pay most for them, either at auction or on a secondary trading market. For some firms, it will be cheaper to reduce emissions than to buy permits.
- Certain categories of firms will receive an administrative allocation of permits as a transitional assistance measure. Those firms could use the permits or sell them.

Quoted from the White Paper titled 'Carbon Pollution Reduction Scheme: Australia's Low Pollution Future', which can be accessed at http://www.climatechange.gov.au/whitepaper/summary/index.html

TEXT BOX 2

Methane

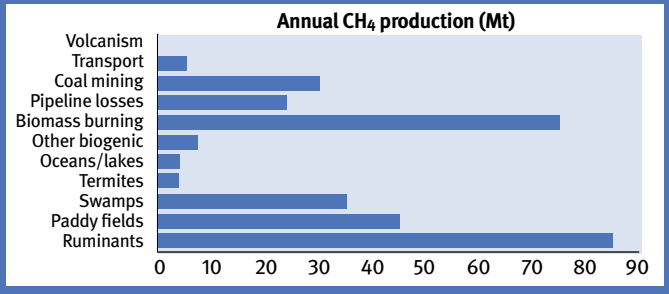
Methane, or CH_4, is a by-product of anaerobic fermentation by certain bacteria (methanogens). Atmospheric methane is derived from either biotic (living) sources such as ruminants, paddy fields, swamps and termites, or abiotic sources such as biomass burning, natural gas pipeline losses, coal mining, transport and volcanism.

The total amount of methane produced is reasonably small on an atmospheric scale (compared with CO_2 and water vapour) and it is not a long-lived gas in the atmosphere. However it is a significant contributor as a greenhouse gas, being about 23 times more potent than CO_2.

Ruminants are a major source of methane. Production varies between animals and is influenced by forage quality. Generally, poorer feed means higher methane production. Cattle in northern Australia produce between 40 and 160 kg CH_4 per year, or about 1 to 4 t CO_2 $^{-e}$. In intensive animal industries, methane is produced by anaerobic effluent ponds.

Methane has always been a production issue in that it indicates a wasteful fermentation process in the rumen; energy that could be used by the animal for growth or lactation is lost as methane.

Using high quality forages, supplements and some rumen modifiers can reduce methane production. Improving reproductive performance and growth rates and reducing age of turn-off will reduce whole-of-life methane production.



TEXT BOX 3

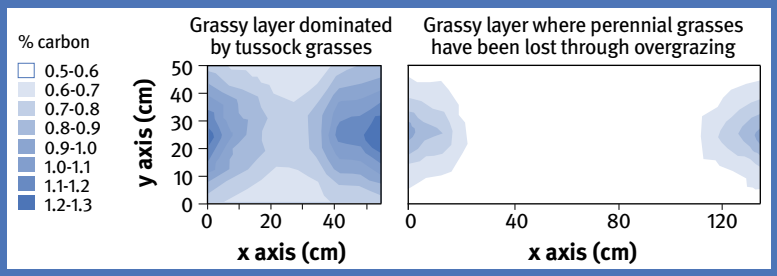
Bio-sequestration in soils

Plants use photosynthesis to capture solar energy and convert atmospheric CO_2 into carbohydrates (simple sugars). Plants then use these to build structural carbohydrates (fibre) and other organic compounds (e.g. proteins and fats). All life on earth depends on this process.

Terrestrial plants have biomass above ground (leaves, stems, flowers etc) and below ground (roots). The above-ground biomass is a source of food for a wide range of animals (including us) and is the basis of food chains. Similarly, the below-ground biomass is the basis of entirely different food chains. Collectively it is referred to as organic matter.

About 33 per cent of soil organic matter is comprised of plant material (mostly roots), about 6 per cent is made up by meso- and macro-fauna (termites, earthworms, nematodes, microscopic mites), and the remaining 60 per cent or so is made up of micro-fauna (bacteria, protozoa etc). Organic matter is vitally important in maintaining the soil's structure, water and nutrient-holding capacity and is important in nutrient cycling.

While organic matter maintains soil health, it also represents a huge carbon sink. Over half of the organic matter is carbon (57%). Reducing soil organic matter emits CO_2; increasing it sequesters (stores) CO_2. Land condition impacts on soil organic matter.



The diagram above is from the Ecograze Project and shows the relative proportion of organic matter, as indicated by % carbon, under grass tussocks where land is in good condition (left) and poor condition (right).

How much carbon is lost or stored by a change in soil carbon of 0.5 per cent?

In one hectare there are 10 000 m^2; the volume of the first 10 cm of soil (which contains most of the organic matter) is 1000 m^3. Using a bulk density of about 1.4 t/m^3 for soil, we can calculate there is about 1400 tonnes of topsoil per hectare. If the soil carbon content is 1%, the soil contains 14 tonnes of carbon/ha. Increasing soil carbon by 0.5 per cent means an extra 7 t/ha carbon, which is equivalent to about 26 t.

If it takes 20 years for this increase to occur, the annual bio-sequestration rate is 1.3 t CO_2 per year. If this carbon is valued at $20 per tonne, then you can potentially earn $26 per hectare per year. Bear in mind however that if this carbon is lost in any way (droughts, overgrazing etc) then you may be liable for the carbon lost, potentially at a higher value of CO_2.

that have a lower 'carbon' cost of production such as chicken or pork.

Obviously, both scenarios pose a major challenge for the beef industry. The problem is exacerbated by the situation that the majority of our beef is exported, meaning that the industry is trade exposed, especially if our competitors don't face the cost of an emissions reduction scheme. Garnaut recognised the problem of trade-exposed sectors and suggested ways in which the issue can be addressed.

Adapting to the CPRS - if not climate change itself

The main emissions issue for the beef industry is methane production (text box 2). One way to reduce your liability under the CPRS is to minimise whole-of-life methane production (methane production per kg beef produced). This is achieved by improving production efficiencies such as weaning rates and growth rates to reduce age of turn-off. These can be achieved through a combination of enhanced breeder management, nutritional management, grazing management and improved genetics.

As we have seen in past articles, reducing stocking rate doesn't necessarily reduce production by a proportional amount, and in many cases is more profitable when long-term costs such as loss of land condition is taken into account. Similarly, reducing emissions by reducing stock numbers doesn't mean that production is reduced by the same amount. The carbon cost per kg beef produced is reduced. The challenge under the rules of the CPRS will be measuring, recording and monitoring this.

The other adaptation that beef producers can make is in land use itself. There is significant potential for agricultural land to be used as a carbon sink, either internally within the enterprise or by other emitting enterprises or sectors, to offset emissions.

Bio-sequestration and carbon offsets

There are several approaches for using bio-sequestration to establish carbon sinks. The most common approach (also recognised under Kyoto) is to establish plantation forests on previously cleared land. The trees extract CO_2 from the atmosphere using photosynthesis and 'fix' carbon in the form of the carbohydrates that make up their tissues (primarily wood). There are general 'rules-of- thumb' for measuring, accounting for and monitoring carbon sink forests. These have been included in the CPRS.

As most graziers know, you don't need to plant trees in most of our cleared eucalypt and brigalow country; they regenerate naturally. While there are some issues with using regrowth as a sink under the Kyoto protocol, and even more for using woodland thickening, there remains significant potential to use these as carbon offsets. Even if this form of bio-sequestration is included in the CPRS, the trade-off between trees and grazing needs to be evaluated on an individual property basis.

Another approach to bio-sequestration is to build soil carbon (text box 3). Generally, by increasing soil health (and soil organic matter) you increase the carbon stored in the soil. While some third party providers are already promoting schemes that measure increases in soil carbon and broker the carbon offsets from emitting industries, they are external to the CPRS.

The key to using bio-sequestration to offset emissions from either within the enterprise or from external sectors will be having robust and auditable

measuring, accounting and monitoring processes in place to ensure compliance under the CPRS.

Summary

The implementation of a CPRS to reduce Australia's greenhouse gas emissions will commence from 2010. Agriculture, although contributing 16 per cent of total emissions, is initially exempt from the CPRS. A decision will be made in 2013 as to whether agriculture will be included in the CPRS from 2015. This decision will depend on the development of suitable measurement, accounting and monitoring procedures.

The grazing industries are the most exposed of all the agricultural industries as they contribute about 68 per cent of agriculture's and 12 per cent of Australia's emissions while contributing less than 1.3 per cent to GDP.

Implications for grazing will commence from 2010 with probable increases in inputs, transport and slaughter being the most obvious. Implications may vary from 2015 dependant on agriculture's inclusion in the CPRS on either a mandatory or optional basis.

Costs associated with administering the CPRS and meeting obligations under the scheme will probably increase at the individual enterprise level. If not participating in the scheme, industries or individual enterprises could face reduced income as impacts of a point of obligation payment filter back down from the point of payment. Increased costs to the consumer could result in reduced demand for beef.

Regardless of the mechanism of negative impact, individual grazing enterprises need to look at improving production efficiencies to reduce whole-of-life methane emissions, or carbon costs per kilogram beef produced.

There is potential for grazing enterprises to use bio-sequestration to offset enterprise emissions or to generate revenue by providing offsets to external enterprises or sectors. This potential will depend on effective rules being developed under the CPRS.

Further information:
www.climatechange.gov.au/whitepaper/summary/index.html

Mexican feather grass – mislabelled as an ornamental garden plant

Mexican feather grass (MFG), Nassella tenuissima, was declared a Class 1 weed in Queensland on 13 December 2007. This plant is related to Chilean needle grass and serrated tussock, both Weeds of National Significance.

In 2008 a Brisbane wholesale nursery received a delivery of MFG plants from Victoria incorrectly labelled as Stipa capriccio and Stipa capillata (both ornamental grasses).

Biosecurity Queensland instigated an incident response in October 2008 when four suspect MFG plants in a footpath garden at Bulimba in Brisbane were identified by a Biosecurity Queensland officer. The Queensland Herbarium formally identified the plants which were then seized and destroyed.

Biosecurity Queensland has conducted a tracing operation to locate and remove plants that have been sold through nursery and landscaping outlets in Queensland. Many plants have been surrendered and destroyed. However when this tracing was completed, 30 per cent of the Mexican feather grass sold to the public was still unaccounted for.

Mexican feather grass is a densely tufted, perennial tussock that grows to about 70 cm high. Leaves are needle-like and roll smoothly between the fingers. They have serrations which can be felt when sliding fingers down the length of the leaf blade. The pale seeds have a small pointed tip and a long bent tail and resemble a large feather when clumped together at the end of the seed head.

Mexican feather grass produces many seeds. It could cause severe environmental damage to native grasslands and has no grazing value for animals because it is low in protein and high in fibre. The seeds can also become vegetative contaminants in wool production.

Our goal is to locate and remove Mexican feather grass plants and conduct nearby decontamination only. At this time we are not looking at prosecution because the plants were mislabelled before entering Queensland.

The high risk areas for untraced sales are Emerald, Mackay, Goondiwindi, Biloela and Surat because the climate in these areas is suited to Mexican feather grass establishment.

The SEQ coastal zone is at lower risk because of the higher rainfall and humidity. However we must still trace all sales that occurred in and around the Brisbane, Ipswich, Gympie and Sunshine Coast areas and locate and remove plants planted out following these sales.

If you think you have spotted this weed, do not disturb it. Contact Biosecurity Queensland on the number below at the first possible opportunity.

Further information:

Phone DPI&F on 13 25 23 or
Mexican feather grass alert webpage:
www.dpi.qld.gov.au

Timely tips Autumn/Winter 2009

April – May

Pasture

- Assess pasture quantity and quality in each paddock. Estimate the pasture's carrying capacity and how long it will be able to carry that many stock.
- Assess current stocking rates. Do stocking rates need to be adjusted to keep stock and, more importantly, country in good condition?
- Do an NIRS test to determine quality of diet your cattle are eating.
- Start preparing land if planning to sow improved pastures in spring.

Dry season management

- Start the dry season management plan that you developed earlier. Stick to plan.
- Evaluate effectiveness and cost benefit of winter supplementation program.
- Make sure you have supplements on hand to meet your dry season management plan requirements.
- Check feed-out equipment.

Bulls

- Remove from breeders.
- Check for defects or physical problems (e.g. sheaths, leg injuries) and cull.
- Cull bulls that are older than 7 years.
- Start dry season supplementation program.

Breeders

- Draft cows according to pregnancy status and body condition for tailored management and possible supplementation.
- Start dry season supplementation.

Calves

- Brand in correct legal position.
- Ear tag, placing NLIS tag in correct position in the OFF ear (see *Beeftalk* No. 25, page 22).
- Dehorn calves (the younger the better).
- Castrate males that are not potential bull replacements.
- Vaccinate with 5-in-1 or 7-in-1.

Weaners

- Wean and weigh. Identify mothers of poorly grown calves for possible culling.
- Draft off any small weaners (less than 150 kg) for special care.
- Feed weaners supplements in yards to train them to eat supplements.
- Wean younger if cow condition is of concern.
- Consider coccidia control measures if weaners are to be hand fed in the yards for a lengthy period.
- Educate weaners through yards and by tailing them out every day.
- Vaccinate with booster 5-in-1 or 7-in-1.
- Vaccinate for tick fever in tick-infested areas.
- Put weaners into the best paddock available.

Mating and marketing program

- Do your herd mating practices give you the maximum number of calves on the ground, at the correct time of the year, without putting undue stress on the cows?
- What are the best markets? Are they going to be the best for a number of years?
- Reassess current marketing strategy. Are you targeting the most profitable market?
- Has anything changed in the markets you are targeting – new specifications? new legal requirements?
- If considering a new market, what inputs do you have to provide to make your cattle suitable for this market? Is it going to be worth it?

Parasites

- Start strategic dipping for pre-winter treatments.
- If resistance appears to be a problem, check using DPI&F Tick Resistant Survey Kit available from DPI&F offices or phone 13 25 23).
- Check worm burdens in weaners (WormCheck). Treat if necessary.
- Treat for buffalo fly to reduce numbers over-wintering.

Business plan

- Conduct tax planning meeting with accountant.
- Assess success of previous year's business plan.
- Plan management strategies for next 12 months (budget, property maintenance and development, marketing etc).
- Are your on-farm Livestock Production Assurance (LPA) records up to date? Would you pass a random audit?

June – July

Pasture

- Re-assess pasture quantity and quality.
  - If quantity and quality will not sustain desired animal performance, consider WHY NOT.
  - If quantity is below requirements, implement your selling strategy.
  - If quality will not sustain desired animal performance, consider options.

Breeders

- Vaccinate breeders as appropriate.
- Pregnancy test 6 to 8 weeks after bull removal.
- Cull breeders from main mob (on temperament, age, defects and non-pregnancy).
- Regularly check on pregnant breeders, especially maiden heifers and first calf cows.
- Order NLIS tags.
- Assess mating program and plan changes if necessary. Consider options for breeding programs e.g. crossbreeding.
- Assess your maiden heifers. Are they going to be heavy enough to mate in October or November?

August – September

Dry season management

- Re-evaluate dry season management plan.
- If season has not broken, assess breeder and weaner condition. Sale, agist or drought feed.
- Draft cattle according to nutritional requirements.

Pasture

- Consider burning native pastures every 2 to 3 years in late winter or early spring after 50 mm of rain to maintain good pasture condition and control woody weed growth.
- If pasture condition needs to improve, remove stock from paddocks that have been burnt until pasture is at least 15 cm high.
- Watch SOI and other long range forecasts for suitable time to plant pasture.
- Ensure paddocks get at least one late spring or summer spell every fourth year to maintain or improve pasture composition.

Bulls

- Check bulls for soundness and determine number required for next breeding season.
- Consider bull type needed to produce calf type best suited for your potential markets.
- Source and evaluate potential bull supplies.
- Assess young home-grown bulls as potential sires.
- Vaccinate with annual vibriosis and 3-day booster for bulls at least 4 weeks prior to joining.
- Obtain advice on breeder vaccination programs e.g. pestivirus vaccination program for all bulls and breeders.

Breeders

- Assess your first calf cows. Are they in good enough condition to get back in calf?
- Check early calving heifers.

Parasites

- Plan tick control for summer. Check for resistance if control program isn't working.
- Check late winter calves for scrub ticks.

Property maintenance

- Check fences and water facilities.
- Check river and creek crossings before next wet season.
- Maintain fire fighting equipment, extinguishers etc and ensure that fire breaks are maintained and serviceable.
- Clean around buildings and check gutters are free of leaves.
- Ensure all personnel know what to do in case of fire. Do they know who to call? Review property evacuation plan.
- Do workplace health and safety audit of property.
- Has everybody been trained to use and maintain the farm equipment in a safe correct and competent manner? Legal liability.
- Do annual electrical safety check on all household and farm equipment.

Personal

- It is not just the animals and property that need maintenance. You and your family are the most important assets on your property. Make sure you go for your annual health checks and ensure you have quality family time together.

Blue heliotrope and the beetle

Blue heliotrope (*Heliotropium amplexicaule*), a plant imported from South America, is a problem weed in many grazing areas in eastern Australia. It is unpalatable to stock and, if eaten, can cause poisoning. Because of its large tap root and aggressive growth habit, blue heliotrope can out-compete grass, reducing the feed available for grazing. A number of chemicals are registered for control of the weed but it is difficult to eradicate the plant effectively with sprays.

In 2001 a leaf-eating beetle (*Deuterocampta quadrijuga*) from Argentina was released to determine whether biological control of blue heliotrope could be successful. The beetle was bred at DPI&F at Kingaroy under the auspices of the South Burnett Landcare Group. A breeding program was also set up by the Eidsvold Landcare Group.

As a result, large numbers of the beetles have been released in southern Queensland. Initial progress was slow but now the beetle can be found in varying numbers from Crows Nest northward and throughout the Burnett. Some areas such as the Brisbane Valley have had multiple releases but permanent populations of the beetle do not appear to have become established.

The beetle needs warm wet conditions to breed and spread. Under ideal conditions the beetle can go through several generations over summer. It pupates and is dormant over winter.

One of the main constraints to the beetle's spread is predation by ants and cane toads. Work carried out by the Eidsvold Landcare Group has shown that when predators are removed the beetles can multiply in considerable numbers.

The beetles defoliate rather than kill blue heliotrope plants, which allows grasses to grow and compete with the plants. Observations over two years have shown that regular defoliation does reduce the extent, spread and seeding of the weed.

The beetle breeding program at DPI&F Kingaroy has now wound down and the Eidsvold Landcare program is providing beetles only for their own members. The only way to obtain beetles in other areas is to collect them from a known field population. In the South Burnett many vacant blocks and roadside areas with blue heliotrope have the beetle.

If you know of local beetle populations, let others know so the beetle can be collected and spread further.

If you have very large areas of the weed, it would be worthwhile setting up your own beetle breeding area to increase numbers. Build a small greenhouse over an area of blue heliotrope plants and control ants and cane toads within this area.

Thanks to these people for providing information in this article:

Terry Haupt, Eidsvold Landcare Group
Ian Crothwaite, South Burnett Landcare Group
Hugh Brier and Jo Wessels, DPI&F Kingaroy.

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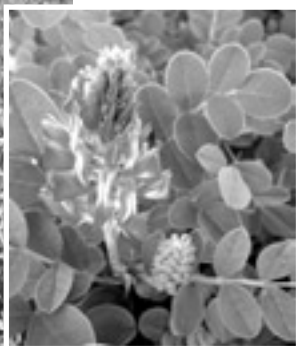
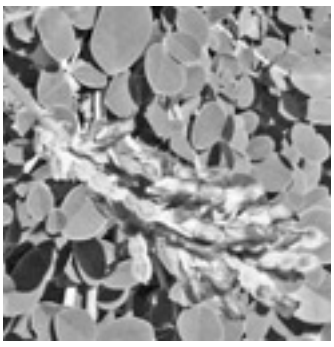
Sulla – potential new forage legume for cropping land

Sulla is a short-lived perennial winter-growing forage legume for fodder, grazing or hay. It is palatable, highly nutritious, non-oestrogenic and equivalent in quality to lucerne.

Sulla is likely to be used in the grain belt of southern Queensland and northern NSW as a short-term rotation in cereal cropping. It can produce 20 t/ha over two years, leading to significant increases in soil nitrogen and organic matter. Sulla is much easier to remove at the end of the pasture phase than lucerne.

Sulla is a semi-prostrate to erect (to 1.5 m high) shrub that grows well between autumn and early summer. Its deep taproot gives good drought tolerance but it becomes dormant in hot summer conditions even if irrigated. Individual plants live for two to three years but it will regenerate readily from seed.





Sulla foliage has bright red flowers. The slightly spiny seed pods contain cream to pale brown-coloured seeds of about 3 mm diameter.

Sulla is adapted to similar areas as lucerne; it cannot tolerate water-logging, acidic or saline soils. It is best suited to the calcareous soils of southern Australia but will grow on well-drained, neutral to alkaline clay to loam soils with pH of 6.5–8.5 and 550–950 mm annual rainfall.

The crude protein content can be up to 26%, digestibility can be higher than 80% and sulla provides metabolisable energy of 10.5–13 MJ/kg DM.

The bright red to crimson flowers attract the bees needed for pollination and seed set (and are good for honey production). Flowering starts in spring with pods maturing about 8 weeks later.

Forage quality peaks before flowering, after which stems become more fibrous and foliage less palatable. Sulla makes high-quality hay. It does not drop its leaf like lucerne during hay-making. However sulla stalks are thicker and, even with conditioning, take longer to cure, especially in winter.

Cultivars

Three new Australian cultivars have been released under Plant Breeders Rights:

- Wilpena is an erect, mid- to late-maturing variety, suitable for hay or silage and for grazing. Seed of this cultivar is more readily available than for Moonbi.
- Moonbi is a semi-erect cultivar with a strong crown, earlier maturing than Wilpena, and suited to grazing and forage production.
- Flamenco is a tall, upright variety that is less leafy than Wilpena and Moonbi.

Planting

Sulla seed (200 000 seeds/kg) is about twice the size of lucerne and should be sown at 5 (dryland) to 10 (irrigated) kg/ha into a fallowed, prepared seed bed. Seed should be inoculated with the specific WSM 1592 rhizobia. Dehulled seed establishes more quickly and uniformly than seed sown in the pod. Aim for an establishment density of 25 plants per square metre.

Seed is sown 1–3 cm deep in autumn so that the plants will develop before temperatures drop below –4°C, which slows the growth of small plants. Sulla has a relatively large seedling, but is slow to establish while developing its deep taproot. The plants become dormant in summer.

Weeds should be controlled before sowing because no herbicides are yet registered for broadleaf weeds in the crop.

The plants form large rosettes that give good soil protection. Sulla is best sown alone as it is readily out-competed by tall or rapidly growing plants and is easier to manage as a single species stand.

Soils low in phosphorus or sulphur would need 100 kg/ha superphosphate every year. Sulla can fix up to 500 kg N/ha over two years if effectively nodulated.

Grazing

As most regrowth comes from the leaf axils rather than from the crowns, sulla should be allowed to grow 40–50 cm high and then grazed rotationally to 15 cm. It is best to use large numbers of livestock on relatively small areas for a short time. Grazing intervals of 6–10 weeks will depend on conditions, but regrowth is generally slower than with lucerne.

Hardseed

While the hardseed proportion is about 80% when first harvested, most of this breaks down during summer and germinates readily in the following autumn.

While sulla has not been trailed widely in south-east Queensland, it does show promise as a winter-growing legume.

Further information:

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NIRS – A nutritional management tool for grazing cattle

For years, scientists and graziers have relied on conventional tests using soil, pasture and animal biological specimens to identify nutritional deficiencies in grazing cattle. Unfortunately, none of these techniques provides a true representation of the quality of the diet the animals are consuming.

Assessment of animal condition is still commonly used to make decisions on supplementary feeding, paddock movements and stock sales. Recently, there has been a shift towards assessing pasture in addition to animal condition when making decisions about nutritional management.

NIRS (Near Infrared Reflectance Spectroscopy) technology enables producers to directly assess diet quality, enabling them to make proactive and more timely management decisions. Over the past few years, NIRS has been adapted for determining dietary quality for cattle on tropical pastures.

What is NIRS?

In NIRS, near-infrared radiation is beamed onto a substance. Some of this energy is absorbed, some transmitted and some reflected, depending on the physical and chemical properties of the material being analysed. Results from numerous NIRS and conventional analyses have been compared to develop calibration equations.

NIRS is used most often to analyse faecal samples, from which the calibration equations are used to predict these attributes:

- dietary crude protein (CP)
- dry matter digestibility (DMD)
- faecal nitrogen (N) concentration
- non-grass proportion of diet
- growth rate.

Ash percentage is also calculated from the faecal samples, and a phosphorus analysis using wet chemistry analysis can be done on request.

The NIRS calibration equations produce predictions, not exact quantitative determinations. The accuracy of the prediction varies considerably with the attribute being predicted. In some cases the accuracy of the prediction can be very good, such as for nitrogen or protein concentration in forage samples.

What attributes are assessed?

Dietary crude protein (CP)

Protein is usually the first nutrient to limit production once pastures mature and hay off. The exception is where there are endemic nutritional deficiencies such as phosphorus.

Dry matter digestibility (DMD)

Digestibility is defined as the percentage of feed consumed that is broken down and absorbed by the animal. Digestibility provides a reasonable indication of the energy value of the diet. As digestibility increases, the quantity of metabolisable energy (ME) available to the animal also increases.

Faecal nitrogen (N) concentration

Faecal N is the amount of nitrogen in the faecal material. Whereas dietary CP is the amount of protein in the diet (that is, going down the animal's throat), faecal N is the concentration of N in the faeces. Dietary CP is NOT calculated from faecal N. However, there is a correlation between dietary CP and faecal N: when dietary protein levels are low, faecal N concentrations are usually low; and when dietary protein levels are high, faecal N concentrations are usually high.

Dietary non-grass proportions

Grass usually makes up the bulk of diets consumed by grazing cattle. Non-grass (i.e. browse or top-feed and herbage) plant material can contribute significantly to the diet, depending on land types and seasonal conditions. The NIRS prediction of dietary non-grass proportions will vary depending on the time of year and seasonal conditions and on the land type being grazed.

Growth rate

Growth rate predictions are based on a 300-kg medium frame steer because this type of animal was used to develop the calibration equation. If the group of cattle being managed are not 300 kg medium frame steers, the predicted growth rate will need to be considered in this light.

Ash

The ash content of most faecal samples falls in the range of 18–22 per cent. Higher faecal ash levels are usually due to soil contamination arising from:

- poor sampling technique
- dung beetles depositing soil within the dung pat
- cattle ingesting soil either on purpose or while grazing short pasture or herbage.

Ingestion of soil is more frequent during drought

when feed is very short and cattle are fed supplements on the ground.

The following prediction errors will occur when faecal samples are contaminated with soil:

- dietary CP is over-estimated
- digestibility is over-estimated
- dietary non-grass tends to be over-estimated.

Producers must take care to take fresh dung samples only to avoid contaminating samples.

NIRS reports

Producers complete a field data collection sheet which goes with faecal samples for analysis. This data sheet provides information which enables the NIRS analysis to be interpreted more accurately. It also equips producers with a means of assessing and recording pasture and animal information objectively.

The NIRS report, the data collection sheet and photographs taken at the time of sampling all help with interpreting the results and also with assisting management decisions in the future.

How well is NIRS working?

NIRS works particularly well on some land systems under certain seasonal conditions. However, results are less reliable when confounding variables occur:

- high proportion of browse in the diet – some browse species contain a high tannin level which binds the protein; although the CP prediction may be accurate, the amount of protein actually available to the animal can be significantly less than the predicted level
- very diverse land systems within a paddock
- high proportion of herbage in the diet
- sampling from a number of classes of stock in the paddock
- stock eating a reasonable amount of energy and protein supplements such as whole cottonseed, protein meal, grain and molasses.

The reliability of the dietary CP predictions for mulga and spinifex country is not particularly good because dietary CP tends to be overestimated; however the non-grass component and the digestibility levels appear to be reasonably reliable. On these land systems, it is a given that protein is more limiting than energy; once stock begin relying on mulga leaves, for example, as a major source of forage in their diet, it can be assumed that the diet is protein-deficient. Monitoring the digestibility of the diet through faecal NIRS provides a reasonable indication of dietary ME, enabling producers to pinpoint when energy supplements need to be provided or whether animals need to be turned off to save on expensive bulk supplements.

Getting dung samples analysed

A private company, Symbio Alliance has been licensed by MLA to do the NIRS analysis.

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New extension officer – Ian McConnel

I grew up on 'Mt Brisbane', a 10 000 acre grazing property near Somerset Dam, where my family runs a droughtmaster stud as well as a commercial breeding herd fattening progeny predominately for the Japanese market.

After graduating with a Bachelor of Applied Science in Animal Studies from UQ Gatton, I travelled to the United States, as the Murray Grey Youth Ambassador, to study meat science and genetics at Colorado State University.

Back in Australia in 2003 I worked at home for a stint before becoming a sheep extension officer in Longreach with DPI&F for five years, where most of my work was in livestock nutrition and breeding.

I will now be working with south-east Queensland landholders on their properties, assisting with

- assessing the condition of pasture, soil and creek frontages,
- identifying the most appropriate options for improving land condition, and
- choosing between grazing management options based on locally relevant information and tools.

I will also be working closely with local catchment and Landcare associations and AgForward to run field days and demonstrations.

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Guide to declared plants

Declared plants are species that have, or could have, serious economic, environmental or social impacts. Declarations are made by the State Government and apply to the whole of Queensland. The State Government declaration should not be confused with a plant declaration by a local authority. Local authority declarations only apply to the area administered by that authority.

Landowners, including state agencies, have a legal responsibility to control state-declared plants on land under their management.

There are three categories of declared plants, each with different prevention, control and/or management requirements.

Class 1 – A pest that has the **potential** to become a very serious pest in Queensland in the future. All landholders are required by law to keep their land free of Class 1 pests. There is generally a concerted effort by state and local government agencies to eradicate new infestations following detection. It is a serious offence to introduce, keep or sell Class 1 pests without a permit.

Examples of Class 1 pests include Mexican feather grass, Chilean needle grass, alligator weed, anchored water hyacinth, horsetails, *Hygrophylla, Mimosa pigra* (prickly acacia), salvinias (except *Salvinia molesta*), and Senegal tea.

Class 2 – A pest that has already spread over substantial areas of Queensland, with impacts serious enough to justify management actions to avoid further spread. By law, all landholders must make a diligent attempt to contain these weeds and implement management actions to reduce their population within the property boundary. It is an offence to keep or sell these pests without a permit.

Examples of Class 2 pests include parthenium, giant rat's tail grass, rubber vine, prickly acacia, annual ragweed, fireweed and *Salvinia molesta*.

Class 3 – A pest that is commonly established in parts of Queensland but its control by landowners is not deemed to be warranted unless the plant is impacting, or has the potential to impact, on a nearby 'environmentally significant area' (e.g. a national park). It is an offence to sell, introduce or release a Class 3 pest.

Examples of Class 3 pests include asparagus fern, broadleaved pepper tree, African fountain grass, athel pine, lantana and creeping lantana.

Non-declared plants may still be 'declared' at a local government level under local laws. For example, in the Sunshine Coast Regional Council (Maroochy area) blue morning glory, coastal morning glory, glycine and Japanese sunflower have been identified as priority pest species. Leucaena has been declared a pest species by local authorities in some western and coastal shires.

Source: 'Declared plants of Queensland' factsheet, Biosecurity Queensland.

Further information:

Local government offices
Local catchment associations
Local land protection officers, DPI&F
DPI&F Biosecurity website: www.dpi.qld.gov.au/biosecurity (search on 'declared plants')
Phone DPI&F on13 25 23 or email callweb@dpi.qld.gov.au

Bookreview

Grasses of subtropical eastern Australia

An introductory field guide to common grasses – native and introduced

by Margaret Elliott

This booklet is a handy field guide to the grasses we have in south-eastern Queensland. There are 72 line drawings and descriptions of many common native and introduced grasses. The drawings are backed up by a CD which has 572 colour photos of 126 species.

The booklet details a species on every page. A brief description covers whether the grass is native or introduced, perennial or annual, its growth habit and general information on where it is likely to grow. Information boxes on the drawings provide additional information for identification. The grasses are divided into five groups according to approximate size – ankle height (low-growing, creeping), ankle to knee height, knee to waist height, above waist height, over shoulder height. A glossary covers technical terms.

Unfortunately there are no line drawings of some of our important grazing indicator species such as black spear grass, pitted bluegrass or wire grass, and the book doesn't touch on the grazing value of the grasses covered.

The book is an excellent reference for improving your grass identification skills. The booklet is A5 size with sturdy spiral binding and a plastic cover. It is just the right size to carry around in a vehicle.

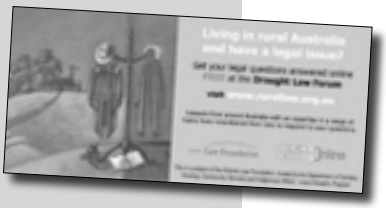
Available from: Nullum Publications, PO Box 1152, Murwillumbah. NSW 2484

Cost: $20 plus postage and packaging

Further information:

Phone: 0410 179 273 or 02 6679 5257
Email: nullumbooks@gmail.com

Legal questions answered for free!



As one of its drought support initiatives, the Federal Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) has funded the Rural Law Online website to provide a free national online legal information service for rural communities, farmers and rural small businesses.

The National Drought Law Forum is supported by 20 lawyers around Australia who are ready to provide a response to any legal query.

The forum has already been viewed by several thousand people. It is a great opportunity for individuals or organisations working with people in rural Australia to ask their legal questions and for the answers to be viewed by many others who might benefit from the information.

Anyone with a legal question or comment can post it to the Forum anonymously and receive a response from an independent legal expert. Organisations working with people affected by drought are also welcome to share experiences or promote their services.

FaHCSIA has also produced a free brochure titled 'A Guide to Legal Services for Rural Australia – Free and low cost legal advice and referral services'. The brochure provides the contact details for services offering free legal assistance as well as other advocacy and support services dealing with a range of legal issues.

Copies of the brochure are available from Rural Financial Counsellors, State Farmer Associations and Centrelink offices around Australia.

Visit the Drought Law Forum and post a comment or question at: www.rurallaw.org.au

If you would like a copy of *Beeftalk* mailed to you, please complete the following form and send to Editor, Beeftalk, DPI&F, PO Box 118, Gayndah, Qld 4625 or Email russ.tyler@dpi.qld.gov.au

Name: .....

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Which of the following best describes you?

☐ Beef producer ☐ Agribusiness outlet ☐ Education ☐ Other (please state) .....

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