Department of **Employment, Economic Development and Innovation**

Beeftalk

Taking stock of your future

Prime news and views for beef producers of South East Queensland

Issue 31 Autumn/Winter 2011

in this issue

2 Controlling coccidiosis

3 Diseases, parasites and poisoning following floods

6 Leptospirosis in cattle and humans

7 How is high density, or mob, grazing different?

8 Genetic improvement for fertility—Sins of the fathers

9 Judging a bull's worth

10 Methane and cattle production

10 BBSE pays dividends

11 Creep feeding beef calves

12 Winter feeding options

13 Medics for pastures

14 Slashing grass?

16 Barbed wire grass *Cymbopogon* species

16 Common toxic plants in SEQ

17 Chemical control of purple-flowered weeds

18 Grazing and timber production—Think about it and act

20 Do your own field trials

21 Timely tips—Autumn/Winter

23 Speargrass grazing guidelines

24 Farewell to Russ Tyler

Queensland Government

editorial

After an incredible summer wet season beef producers in South East Queensland have a lot to think about in moving forward this year. To those affected by the floods across our region, our thoughts and sympathies go out to you and your family and friends. Watching the floodwater rise across my block in Ipswich was definitely an event I won't forget in a hurry!

This edition of *Beeftalk* aims to provide useful information on recovery from additional weed pressure and ways to make the best of the extra rain we have received. Articles such as 'Diseases, parasites and poisoning following floods', 'Winter feeding options' and 'Medics for pastures' all discuss ways to reduce risks in the season ahead.

This edition has articles on tools and information available for breeders to select and efficiently use the bulls they buy. Especially timely as many breeders may look to re-stock after a period of drier seasons.

Following feedback to Damien O'Sullivan's article on purple-flowered weeds, Damien has written an article about controlling these weeds. This is a practical article that provides excellent information for producers to act on at home.

This edition also includes a farewell to Russ Tyler who has retired from the Department. I would like to personally thank Russ for his mentoring and, on behalf of the readers and writers of *Beeftalk*, to thank him for his tireless efforts over the last 15 years to make this publication what it is.

We would love to hear from you—if you can, please find time to provide feedback or ideas for future articles, using the feedback form provided with this newsletter.

Happy reading!
The Ed

ISSN 1326 6101

Controlling coccidiosis

Coccidiosis, also known as black scours, is a common problem in weaners. Coccidiosis causes damage to the wall of the intestine, resulting in reduced feed consumption, weight loss and, in severe cases, death. The black diarrhoea—the most obvious symptom of coccidiosis—is usually seen about a month after weaning. The scouring doesn't become evident until the coccidian numbers have been building for about four weeks, by which time most of the damage has been done.

With good husbandry and nutrition, the disease and associated production loss, can be prevented.

Causes

Two coccidia protozoa cause most problems, *Eimeria zuernii* and *E. bovis*. These coccidia are common in the intestine of cattle. Calves contract them from herd mates within a day of birth. These protozoa rapidly multiply and cause coccidiosis when the immune system in the calf's gut is compromised.

The stress of weaning can compromise the immune system of calves because the immune system relies on a constant flow of food, and any interruption, even for a day, can allow the coccidia population to increase, leading to clinical signs of the disease.

Identification

The clinical signs of coccidiosis are:

- sudden onset of severe, foul-smelling diarrhoea, which may be blood-stained with either a dark tarry smear or fresh red clots, and which also may contain shreds of mucous
- straining
- dehydration
- anaemia
- decreased appetite.

The symptoms of coccidiosis are very similar to those of many other bowel problems, so the presence of black scour is not a sure sign of coccidiosis. It is most commonly confused with worm infestation.

Just as calves have coccidia, they usually also have a few worms that will often build up following weaning. When treatment for worms is given, in most cases the diarrhoea clears up. However, before treating for worms it is best to have a worm egg count done to determine the severity of the infestation.

Outbreaks

The main concern in outbreaks is the potential for coccidiosis to affect a large proportion of the mob.

The main risk factors for coccidiosis are poor nutrition immediately after calves are removed from their mothers and stress, which may be due to suboptimal handling practices or facilities, or severe weather conditions such as cold and/or rain at the time of weaning.

Prevention

Some simple steps can greatly reduce the incidence of coccidiosis:

- Provide weaners with good quality feed (usually hay) as soon as they are weaned. The feed should be in the weaner yard as soon as the calves are removed from their mothers. Feed hay and other supplements in troughs and racks. Keep water clean and practice good husbandry.
- Try to time weaning to avoid extreme weather conditions at such as cold and wet.
- Include a coccidiostat in any ration fed to calves, particularly those under 150 kg liveweight. The two products most used are Bovatec and Rumensin, which contains monensin. Most commercial supplements, such as weaner pellets, contain a coccidiostat. The recommended feeding rate for monensin is 10–20 mg/head/day.

Note: Monensin is toxic to horses, dogs, pigs and humans.

Treatment

If a coccidiosis outbreak occurs, the mob, and especially affected animals, should be nursed and given a supplement that incorporates a coccidiostat. Nursing means segregating if needed, reducing overcrowding, providing good clean water and feed, and removing any other causes of stress.

Veterinary advice should be sought for severe cases.

Most animals recover once the cause has been removed but this may take some time. If stress continues, the diarrhoea will persist and long-term damage may occur.

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Diseases, parasites and poisoning following floods

Some animal diseases, parasites and poisonous plants that thrive during and following wet conditions can have serious impacts on stock and future production.

Diseases in cattle

The long term prevention of most of the diseases mentioned here is a well-managed vaccination program, which is also the best way to avoid a crisis situation developing during and following flood events.

Three-day sickness

Three-day sickness is a cattle virus spread by biting insects. The disease causes temporary or permanent infertility in bulls, loss of body condition, decreased milk production and calf-growth rates, and abortion. Three-day sickness can be fatal in a small percentage of affected animals. Initial symptoms include fever, lameness, shivering, drooling and possibly a discharge from the eyes and nostrils. This sickness is sometimes confused with tick fever and taking diagnostic samples should be considered.

Treating valuable animals with anti-inflammatory drugs may be warranted but is not always effective. Generally treatment is limited to giving the animals water and possibly moving them to a shaded area.

Akabane

The virus akabane is spread by biting insects but the disease rarely shows until calving time. It can cause calves to be born with limb malformations or brain lesions. There are no means of preventing or treating akabane, but producers still need to be aware of the possibility of the virus.

Blackleg

Blackleg most commonly affects cattle younger than two years of age. It is caused by bacterial spores from a contaminated environment being ingested or gaining entry to the body through small wounds. Signs of disease can occur some months later, often being triggered by bruising or injury. Common signs include fever, severe depression, gassy swelling under the skin or in muscles, even before death, or sudden death, after which the carcass usually bloats rapidly.

Leptospirosis

All farm animals, including dogs and horses, can be affected by leptospirosis. The disease is transmitted in the urine of an infected animal and is contagious as long as it remains moist. Leptospirosis infection can result in death but common signs include fever, abortion, infertility and weakness in newborns.

Vaccination can prevent animals that are already infected from developing clinical leptospiral disease. The animal will remain infected and still able to transmit disease organisms, albeit in reduced numbers.

Venereal diseases

Breeding stock that were on other properties during the flood may have been exposed to venereal diseases such as vibriosis. If abortions are noticed or the calving rate is lower than expected, testing for these diseases is warranted.

Botulism

This disease causes a progressive paralysis that generally results in the death of the affected animal. Botulism is caused by the ingestion of a toxin found in rotting animal and plant material or on the bones of dead animals. While the disease is generally associated with phosphorus-deficient country where cattle chew bones in an attempt to satisfy a craving for phosphorus, it can occur anywhere.

Decaying vegetation and dead animals, including wildlife, are potential sources of botulism toxin. Animals seeking feed in the immediate aftermath of flooding may be more likely to consume decaying material.

Parasites in cattle

Cattle ticks and tick fever

Cattle ticks thrive during and following wet conditions. As tick numbers rise there may also be an increase in tick fever risk. Very few ticks actually carry and transmit tick fever organisms. Even when tick numbers are moderate, it is possible that animals will not be exposed to tick fever organisms. Producers should be particularly vigilant if tick numbers have been minimal over previous years.

Tick fever generally causes severe symptoms, with animals showing depression, weakness, jaundice, increased temperatures and staggering. Untreated, tick fever has a very high death rate.

Young animals are most at risk because they may not have been sufficiently exposed to ticks to acquire immunity. Older animals can also be affected. In tick-infested areas all weaners should be vaccinated with trivalent tick fever vaccine. Cattle introduced from tick-free areas should be vaccinated on arrival.

There are three strains of tick fever and one, two or all three may be present in a herd. When returning displaced stock, owners should assess the risk of introducing ticks carrying tick fever strains that are new to their herd. The probability of introducing different tick fever organisms increases with distance from the home property (i.e. close neighbours probably have similar tick fever strains).

Additionally, returning stock may also introduce different tick strains that may be less sensitive to tickicides than the strains already present. Treat returning stock to kill ticks from other properties before releasing the stock back into the herd.

Worm infestations

Moist conditions favour the survival of worm eggs and larvae on pasture. Consequently, an increase in worm infestations may occur in the immediate post-flood period while animals are still under stress and are congregating for feeding or treatments.

Livestock owners should monitor animals for signs of worm infestations including scours (diarrhoea), soiled tails or pale gums. Worm infestations can result in a failure to thrive and, in more serious cases, death.

Most adult cattle will have sufficient immunity to resist a worm infestation, unless they are already weakened by other diseases. Younger stock are more likely to become infested and show signs of disease and loss of production.

Carry out a Wormcheck test to verify worm levels. Test kits are available from many produce agents or from the Worm Buster laboratory, phone 13 25 23. The results of this test will come with recommendations for further action, including treatment.

Worrisome insects

The populations of biting insects usually increase significantly after floods or heavy rains. These insects include buffalo fly, midges, mosquitoes, sandflies and other biting flies. Persistent biting can cause distress to livestock and result in loss of production due to the animals walking excessively and failing to feed properly.

Although it can be difficult to muster livestock during and following floods, the effort may still be warranted to address issues with biting insects. Contact your local veterinarian for advice on specific treatment products and how to administer them.

Diseases in horses

Equine Infectious Anaemia (EIA)

This viral disease of horses is transmitted by biting flies and some mosquitoes. Central and western Queensland river systems are known to be areas of endemic EIA infection.

EIA can present as a very mild condition up to an acute disease resulting in death. Symptoms include temperature rise (often with fluctuations), jaundice, anaemia and wasting. Infected horses may have these symptoms for an extended period of time while showing no apparent response to treatment.

Preventative measures include testing horses and removing known infected animals.

Hoof abscesses

Contact with wet ground during and following extended periods of wet weather can soften the hoof tissues, predisposing horses' hooves to abscesses.

Bacteria or foreign matter including sand, gravel or silt can enter the hoof and cause infection in the soft tissue via:

- a separation in the white line (sole-wall interface)
- penetration of the sole (bottom of the foot)
- hoof wall cracks
- old nail holes.

If affected, the horse will usually become lame quite suddenly, showing mild to non-weight bearing lameness. The hoof will also be hot to touch. If left untreated, the abscess can burst through at the coronet.

Owners can reduce the likelihood of hoof infections, and abscesses in particular, by taking some basic precautions:

- Move horses away from wet or muddy areas. Horses need to have firm dry footings where their hooves can dry out.
- Keep hooves (including soles) clean of mud and manure. Consider disinfecting hooves that have been exposed to floodwater or mud.
- Make sure proper hoof care is carried out, concentrating on maintaining a strong healthy white line. If unfamiliar with hoof care, obtain the services of a farrier or veterinarian.

Contact your local veterinarian promptly for advice and treatment for any problems associated with horses.

Plant poisoning in livestock

As floodwaters recede, be on the lookout for poisonous plants. Some of these plants could be new to the property, having been introduced by the floodwaters.

If you don't know a plant species, get it identified as soon as possible.

Noogoora burr

Noogoora burr is common on watercourses and in some cultivation paddocks. The seed, which is easily spread by flooding, germinates quickly after rainfall and is poisonous when in the two-leaf stage of growth.

Affected cattle show signs of excitement, nervousness, trembling and a tendency to charge. They salivate freely and kick at their abdomen as if in severe pain. These symptoms continue when the animal goes down until it becomes comatose and dies. Death usually occurs in 12–24 hours and so animals poisoned with noogoora burr are usually found dead.

There is no effective treatment for this poisoning.

Mother of millions

These plants, and especially the flowers, are poisonous to stock and occasionally cause a significant number of cattle deaths. Mother of millions is often moved by flood waters and can grow undetected in long grass until it flowers.

When cattle are under stress or in unusual surroundings they are more likely to eat strange plants. Shifting cattle to new paddocks, moving stock through infested rubbish dumps and coping with reduced feed during times of flood or drought can all contribute to poisoning. Since mother of millions flowers from May to October (during the dryer months of the year) the scarcity of feed at this time can cause cattle to consume lethal amounts of the plant.

Poisoned cattle show signs of dullness, loss of appetite, diarrhoea and heart failure. Some cattle may drool saliva or dribble urine. There are two responses to poisoning:

1. acute—cattle die within a day

2. chronic—cattle may take up to five days to die.

Some cattle make a slow recovery if they ingested only small amounts of the plant material.

Crotalarias

Crotalarias often cause poisoning in livestock, especially in cattle and horses. Not all species of crotalaria are poisonous, but those that are usually cause liver damage and can be fatal in extreme cases.

Common signs of crotalaria poisoning in cattle include poor growth or wasting, jaundice, aimless walking, staggering, apparent blindness, weakness and collapse. Additional symptoms that occasionally occur include skin irritation and reddening (often progressing to some skin death), drooling and diarrhoea.

Horses affected by crotalaria poisoning show similar signs to cattle, but can also experience paralysis of the tongue and larynx and breathing difficulties. Two species of crotalaria are known to cause ulcers in the oesophagus of horses, which prevent the horses from swallowing food and water.

The effects of crotalaria poisoning are cumulative, so it's important to act early. There are no specific treatments for crotalaria poisoning, but if the problem is confirmed early you can stop it from escalating by moving livestock to a location where the plants aren't present.

In most cases, damage is generally permanent but some animals can recover with supportive therapy that includes good feed and nutritional supplements.

Grasses and sorghum

Some common plants can become toxic during overcast conditions or if plants are stressed or wilted. Under these conditions urochloa grass, button grasses, sorghum species and the common native couch grasses can accumulate nitrites or prussic acid (cyanide), both of which are toxic to livestock.

Nitrate and prussic acid poisoning can be fatal to livestock, but urgent treatment can save affected animals.

Signs of nitrite poisoning, from ingesting urochloa and button grasses, include rapid, gasping breathing, bluish gums, convulsions and muddy brown-looking mouth and eyes. Affected livestock may also walk through fences or into objects.

Signs of poisoning from prussic acid, which can build up in native couch grass and sorghums, include rapid deep breathing, salivation, a rapid weak pulse, muscle twitching or trembling, spasms, staggering and sometimes a bluish discolouration of the gums.

Some poisoning can be fatal within as little as an hour, so if you notice any of the above signs in your livestock it is important to seek advice urgently to increase your chances of saving the animals.

Contact your local veterinarian for advice and treatment if plant poisoning is suspected.

Note: When using chemicals you must read the directions on the chemical container. These directions specify the species that can be treated, dosage rates, re-treatment intervals, and withholding periods to be observed before sale for slaughter. These directions change from time to time, so read the directions each time you buy a new batch of chemical.

More information:

Your local Beef Extension or Biosecurity Officer
or www.biosecurity.qld.gov.au

Leptospirosis in cattle and humans

Leptospirosis is an important public and animal health issue. The disease can infect anyone working with, or near, infected animals as well as people who work with animal products, such as meat and dairy factory workers. Recently a number of cases have been confirmed in people who have been working in floodwaters.

In livestock, the disease can cause a severe drop in production due to abortions and decreased milk production.

Fortunately, a well-managed vaccination program can prevent the disease.

What is leptospirosis?

Leptospirosis is a bacterial infection that colonises the kidneys and genital tract of its host. Leptospires can be shed from these organs into the urine for more than 12 months, releasing more bacteria into the environment. The bacteria can also be shed in milk, but pasteurisation will kill the organism. Therefore, milk from unvaccinated cows that is not pasteurised may contain leptospires and transmit infection.

What causes leptospirosis?

The bacteria *Leptospirosis hardjobovis* and *L. pomona* are the most common leptospires causing leptospirosis in Australian beef and dairy cattle. There are, however, several other less common serotypes.

Leptospirosis in cattle

Most cattle show no obvious signs of infection with *L. hardjobovis* but may be shedding the bacteria. Infection has been reported to cause abortion, usually from four months gestation to term. Infection can also result in the birth of weak or stillborn calves. Sudden milk drop and fever, mastitis and infertility are clinical signs of infection. A flaccid udder with all four quarters affected may also occur. Infection by *L. pomona* can cause acute septicaemia in calves, which may result in high mortalities. 'Red water', anaemia and jaundice may also occur.

What conditions are favourable for leptospirosis?

Leptospires can survive in the environment in moist places. This includes wet areas around the dairy, along waterways and in irrigated pastures. Leptospires can survive for at least six months in water-saturated soil, several months in running water and several weeks in stagnant water. Restricting cattle access to wet areas will help to control the spread of leptospires. As this is not always possible, vaccination offers the best protection.

Introduced stock can be a source of herd infection. However, closed herds are not completely safe because water flowing from other properties can carry the bacteria.

How is leptospirosis diagnosed in cattle?

A blood test is the most common method of diagnosing the disease in cattle but test results are not always accurate because the antibody levels can fall rapidly. If you suspect leptospirosis, consult your veterinary practitioner regarding advice, diagnosis and management of the disease.

Leptospirosis in humans

Leptospirosis is a notifiable disease in humans in Australia. However, medical research indicates that the true number of cases is much greater than those reported. Many sufferers do not seek medical attention or diagnostic tests are not completed.

Humans contract leptospirosis through direct contact with infected urine, placental material or water. Leptospirae organisms can enter the human body through the mucous membranes of the eyes and mouth, damaged skin or waterlogged feet.

The symptoms of leptospirosis in humans are similar to those of a severe flu. Consult your doctor immediately, and always mention the possible risk of leptospirosis. The severity and duration of the illness can be lessened with the prompt use of antibiotics. Severe leptospirosis cases will be treated in a hospital. Duration of the stay can vary from several days to weeks. Typically, the sufferer becomes ill but, with medical treatment, returns to light duties by three weeks. However, some people have been unable to resume a full workload for six months or more. Relapses can occur, especially during periods of high stress and workloads.

Leptospirosis can cause serious problems for pregnant women. The very high fever of the expectant mother with leptospirosis may be dangerous to the foetus, resulting in abortion, or the foetus may itself develop leptospirosis. Leptospirosis can be fatal to a human foetus.

How to prevent leptospirosis in humans?

1. Conduct a well-managed vaccination program in your cattle.
2. Use protective clothing when involved in high-risk activities. Cover all cuts and abrasions with waterproof dressings, and wear protective glasses, gloves, aprons and waterproof boots.
3. Limit contact with potentially infected materials by installing splash guards and urine drainage channels in dairy sheds. Move people away from urinating animals and limit people's access to high-risk areas.

Adapted from an article by CSL Veterinary.
Further information:
Your general practitioner or veterinary surgeon

How is high density, or mob, grazing different?

While it may seem there are many different grazing systems, we can easily divide them into five main categories. The first four are fairly well-known but you might be interested in the practicalities of a newer grazing system known as high density, or mob, grazing.

Set stocked

A paddock is stocked on a permanent basis with a certain number of cattle e.g. 60 breeders in the Bore paddock. Numbers may vary slightly depending on the season.

Wet season spelling

Each year one paddock is spelled over the growing season to allow pastures to rest and go to seed. All other paddocks are grazed.

Rotational grazing

One mob of cattle is circulated around a number of paddocks. The producer determines the length of time each paddock will be grazed by assessing feed availability, size of paddock, number of paddocks available, and class and condition of the cattle.

Cell, time control, or managed grazing

In this more intensive form of rotational grazing stock are moved, as often as once a day but more commonly every few days, depending on feed availability. Paddocks are divided into smaller areas, generally by electric fencing. Pastures are grazed to keep them in the vegetative stage for as long as possible.

High density grazing

In this system, sometimes called ultra-high density grazing or mob grazing, stock are put on pastures at very high densities. An example would be 750 x 450 kg animals on one hectare or 300 x 450 kg animals on one acre, for very short periods. The stock are moved at least daily with some operators moving the stock up to eight times a day. Cattle are confined by electric wire. In many cases water troughs are moved as stock move through the system. Proponents say they can increase stocking rates by up to 50% by using this system.

This grazing system is designed to mimic the effects of large grazing animals in Africa and the buffalo in the United States. Originally, these animals moved through an area eating everything in their path while at the same time fertilising the pasture with their manure and urine. These rangeland pastures then rested for considerable periods of time before the herds grazed them again.

The key to this system for commercial grazing is the increased rest that the pasture receives. On more fertile soils an area of pasture may several times but grazed for a total of only four days in a year.

Graziers using high density grazing generally aim for the stock to consume 60% of the pasture, trample 20% of the pasture into the soil and leave 20% standing. The pasture trampled into the soil gives the soil microorganisms the organic matter they need to increase carbon levels in the soil. One noted proponent of the system has claimed an increase of soil carbon from 1.5% to 8% over eight years, which is a dramatic increase. Research in Texas USA found that pasture composition could be beneficially changed over four years with a carefully managed high density grazing system.

So is it worth the effort? Those who have tried and persisted have reported favourable returns and considerable improvements in soil biology.

However, while proponents claim these intensive systems increase the kilograms of beef produced per hectare, it is important to note that individual animal performance can be lower. Remember, the more of a plant an animal is forced to eat, the lower the quality of their diet. Therefore, steers that need to achieve a certain weight gain to meet market specifications might not reach their required weight and cows and calves might not produce as successfully. The issue of labour also needs to be considered, with stock needing to be moved daily.

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Genetic improvement for fertility—
Sins of the fathers

What can bull semen tell us about the fertility of the bull's daughters?

A Beef CRC project is investigating whether a high sperm count in a bull's semen might be an indicator of not only the animal's own fertility but also the fertility of its daughters.

The answer to that seemingly odd question isn't clear yet, but the early indications from the multi-year project is that bull semen really might offer a guide to cow fertility.

In October 2010 the last set of measurements on bull calves from six matings of Brahman and Tropical Composite research herds were taken. Now the monumental task of analysing the data is underway.

The scientists are hoping that a clear signal will emerge from the data, showing that some easily-measurable traits in young bulls can be linked to increased fertility in their daughters.

Researchers did some preliminary analysis on the first three drops of bull calves and found 'enough in the data to get excited about'.

One of the most promising lines of enquiry is the percentage of normal sperm in a bull's ejaculate.

Not only is this a reliable indicator of his calf-getting ability in multiple-sire mating, but there are also intriguing signs that it may be a guide to some key indicators of fertility in the bull's daughters.

Preliminary analysis suggests that a high percentage of normal sperm points to daughters that reach puberty faster than heifers born of bulls with lower levels of normal sperm.

The same measurement also seems to point to lactating first-calf cows that are ready to mate at a shorter interval after calving (i.e. shorter post-partum and oestrous interval).

This is a particularly important trait, so long as it doesn't compromise the survival of cows that re-conceive early after calving.

What's also attractive about the 'percent normal sperm' measurement is that it doesn't need new technology to measure it.

The measurement is already a component of the bull breeding soundness examination (BBSE) conducted by veterinarians. It is currently available as a test from a number of morphologists through an accreditation scheme conducted by the Australian Cattle Vets Association.

Another indicator showing promise is the insulin-like growth factor (IGF), a protein that circulates in the blood. Preliminary results showed a good genetic relationship between IGF levels in a bull calf and early puberty in its future female offspring. The protein might also be an indicator of how efficiently an animal uses feed.

If these relationships hold true then IGF levels taken from a young bull calf might become a valuable guide to whether the calf should be castrated or left entire as a potential sire.

Other promising traits that may be associated with male and female fertility are flight time (a measure of temperament) and the age at which bulls reach 26 cm scrotal circumference. Or it might be that scrotal circumference at 12 months is a predictor of sire fertility later on, or even of the fertility of that sire's female offspring. It's a matter of analysing the results.

Even where relationships are found, there is no guarantee that the measure will become a useful industry tool. Cost-benefit analyses will have to be applied to ensure that a strategy's potential

Validation

To ensure that the results gained in the research animals have wider relevance, results of genetic research are 'validated' in an unrelated population. This involves finding unrelated herds of cattle where good records are available. The research results are then compared to the records in these herds to see if the same results occur. While this process is time-consuming, it does not take the same amount of time as the original research.

Validation is particularly important when using genetic markers. The question to answer is, 'Does the gene or sequence of genes that indicate a certain trait in one population indicate the same trait in a completely unrelated herd?'

earnings outweigh the cost and inconvenience of testing.

Ultimately, the Beef CRC researchers will look at rolling useful relationships into BREEDPLAN to make them readily available for all performance-recorded bulls.

If several useful relationships between a bull and the fertility of his offspring emerge, they may be better expressed in indexes that weight the different traits according to their heritability and economic value.

But, faced with a huge volume of data to analyse and results to validate in other populations of bulls, the results are some way off being commercially available.

In all these studies, there's a lead time between getting a result and working out how it is best applied to the industry.

Judging a bull's worth

Many beef producers still prefer to assess the worth of an animal by its looks. The biggest, fattest bull is often the most popular. However, this tradition may be undermining profitability.

Many commercial breeders do not have a strong understanding of how to use estimated breeding values (EBVs) to ensure the bull they select will take their herd forward. Perhaps they are unsure how tools like EBVs (which have been around for some 30 years) and the newer DNA marker panels can be used.

Cattlemen are foregoing potential profit by ignoring genetic improvement. Improving economically important traits such as weight and fertility by nutrition and management strategies is essential but the tools to make real genetic change are available and very under-utilised by many cattle producers. Improvement by management and by genetics are totally complimentary and cumulative, so how about using all resources available to become more profitable?

EBVs

EBVs indicate genetic merit, and are calculated from information on the animal's performance and the performance of their relatives and progeny. This information is used to make a prediction of the genetic worth of an animal. The newer genomic DNA markers are developed from an analysis of minute differences in the animal's genome sequence, which may point to genes that impact on a desired trait. In the future this DNA information will be used in the development of more accurate EBVs.

A trial examining the outcomes of selecting for traits using EBVs involved three sets of Angus bulls where the first group was selected on EBVs for intramuscular fat (IMF), the second on EBVs for retail beef yield and the third for progress in both traits. These bulls were mated to a random sample of Hereford cows and the progeny measured for IMF and retail beef yield at slaughter.

The results demonstrated:

- clear responses to selection of sires on EBVs for specific traits
- excellent prediction of effects on carcase traits in the progeny
- responses consistent across a wide range of environments
- producers have the option to select for more than one trait at the same time (even if negatively correlated).

Cattle producers in the northern beef industry, where cattle run in extensive production systems, often raise the point that it is difficult for them to collect measurements on individual animals and their progeny. This is not to say it can't be done. In fact, in these extensive breeder regions, a renewed focus on heifer management, breeder performance and bull selection based on inherent fertility is imperative.

Further information:

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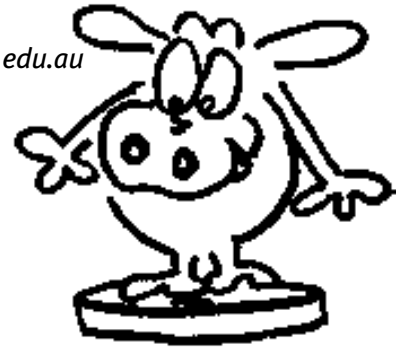

Methane and cattle production

In recent years there has been a lot of publicity about the methane produced by livestock and its contribution to the 'pool' of greenhouse gases and the flow-on to global warming.

From a production point of view, however, a loss of methane represents a loss of energy that has been fed to the animal.

With few exceptions, all animal feeds contain energy. Microorganisms in the rumen break down this energy into volatile fatty acids (often referred to as VFAs). These VFAs are absorbed across the rumen wall to be used by the animal for maintenance and production. Methane is a by-product of the production of VFAs and is lost when the animal belches.

A project at Brian Pastures Research Station showed that the addition of 20% coconut or cottonseed oil to supplements of copra or cottonseed meal increased liveweight gain without increasing overall methane production. So, while the methane produced each day stayed the same, the methane produced per kilogram of liveweight gain decreased. The increase in liveweight gain means that the animals will reach their target weights sooner, therefore reducing overall methane emissions.

This project supports findings in similar projects that have also shown that as liveweight gain increases, methane production per unit of liveweight gain decreases.

A number of research projects investigating ways to increase the efficiency of digestion and reduce methane production are underway.

Ruminant digestion

The digestive system of a ruminant includes four stomachs—the rumen, reticulum, omasum and abomasum. Of these, the abomasum is the 'true' stomach and similar in function to that of a monogastric (single-stomach) animal such as a pig. This four-stomach system has evolved to digest large quantities of fibre (i.e. grass). The rumen and reticulum, which can hold approximately 60–100 litres in an adult animal, contain large numbers of microorganisms (about 10 000 million per mL). The microorganisms play a vital part in the breakdown of feed. As a by-product of this breakdown, methane is produced.

BBSE pays dividends

Paul and Jackie Lindenmayer from Yerilla near Mundubbera run 850 breeders and finish cattle for the European Union market. Over the past five years they have had a bull breeding soundness examination (BBSE) done on all their bulls prior to mating and insist on a BBSE for all bulls they consider for purchase. The Lindenmayers have noticed many benefits to their business by incorporating this test into their management.

By culling bulls that do not pass the test, they have reduced their bull numbers from 35 to 21 with no reduction in pregnancy rate. Assuming an average purchase price for bulls of $3000, this equates to a saving of $42 000. They have less money tied up in bulls, which means they are in a position to pay more for bulls that meet their selection criteria, if necessary.

The family now sells any bull that doesn't pass the BBSE. Paul says keeping a bull for a year just in case he 'comes good' is like putting $1000 in a box in the bull paddock for a year. On top of this, the bull will be eating grass that could be used by a more productive animal.

Paul notes that since the bull numbers have been reduced, there is more work for each bull and less time for fighting.

In 2006 Paul and Jackie, along with other members of the Three Rivers BeefPlan Group, attended the MLA Breeding EDGE workshops. This started participants thinking about how they were managing their breeder herds and prompted similar changes on many properties.

Creep feeding beef calves

What is it about?

Creep feeding is a system for supplementing calves still on their mums. Creep gates or fences allow the calves to access feed while excluding the cows.

The calves perform better but they still exert the same milk demand on the cows, so creep feeding provides no direct benefit to the cows. If cow condition is a concern, then the preferred option is to wean the calf to remove lactation pressure from the cow.

If cows benefit at all from creep feeding it could be due to the calves eating less pasture, leaving more available for the cows (possibly 10%). However, if pasture is limiting, reducing the stocking rate will be far more beneficial than creep feeding the calves in the hope of saving pasture for the cows.

Under normal circumstances a calf will grow at least 0.7 kg per day while on the cow. A ration to maintain or improve a calf's performance must be of similar quality to milk. The ration must be very palatable or the calf will not eat enough to make a significant difference to its performance. Calves prefer milk first, palatable creep ration second and forage third.

When might you use it?

As with all production feeding, the economics need to be carefully considered. In particular, factor in the cost of the ration and associated labour, the value of the unfed calf and the likely weight and price advantage of the fed calf. Generally, creep feeding will only be economical if there is a specific target market offering a price premium for the younger and heavier calves, and the calves are sold while still using the creep feeder.

Note that if the calf is consuming a significant amount of a creep feed, it will have a lower gut fill than a similar unfed calf, and therefore the actual weight of the calf may not reflect its true carcase weight advantage. A lower gut fill will show up as a higher dressing percentage.

If the creep-fed calves are not sold, then any weight gain advantage over non-fed calves may well be lost over time, due to compensatory gains. The economics of selling calves straight off the cow versus holding them for longer is another issue to be considered within the context of a whole farm economic analysis.

Circumstances where creep feeding might be attractive include:

- If stock are coming close to, but are not likely to make, their market specification to reach a premium because paddock feed and cow and calf performance is reducing (but cow condition is still okay, otherwise weaning would be the better option).
- If creep feeding will enable stock to be sold earlier rather than have them, or a tail, carry over. Selling would provide pasture and capital management benefits, particularly in dry years when feed is short.
- When the creep feed is cheap and the finished stock price is high.
- In herds with low milk or high numbers of first-calf heifers or aged cows.
- To extend the use of a limited area of high-quality pasture or crop by only letting calves have access.
- As a method of weaning calves by closing the calves on one side of the fence and cows on the other, and moving the cows away after a few days. Research has shown that calves weaned this way still need to go through the yard weaning and training process or they will have reduced performance in finishing systems (MLA Tips and Tools: 'Yard weaning methods for preparing feeder cattle').

How else does it affect herd management?

Creep feeding can have some negative impacts on herd management.

- Heifer calves that are overfed and become obese will have excess fat deposited in the udder, which can reduce future milking capacity.
- Creep feeding will confound certain management decisions. For example, calf weight on weaning will be due to both cow milk and creep feed, so this measure won't provide an accurate basis for selecting cows.
- Creep feeding will also mask the performance of poor milking cows because the calves will eat more creep ration to compensate for low milk intake.

Reference: *Creep feeding beef calves. Agfact A2.5.4, 2004*, Industry & Investment NSW. www.dpi.nsw.gov.au/agriculture/livestock/beef/feed/publications/creep-feeding-beef-calves

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Winter feeding options

It is almost a tradition that the Autumn/Winter edition of *Beeftalk* has at least one article on supplementary feeding. When I look back through these articles the basic messages are the same:

- Plan ahead.
- Do a feed budget and determine how many cattle you can comfortably carry until the break in the season.
- Sell or agist cattle so that stock numbers match the feed available.
- Determine target production levels for each group of cattle.
- Wean calves to conserve cow condition and reduce the cost of supplementary feeding.
- Use supplements as a tool in an overall management plan to meet targets profitably, not as a 'fix all' to make up for poor planning.
- If you do have to supplement, select a supplement that
  - contains the nutrients that the animal needs
  - is convenient to feed out
  - is cost effective.

Which supplement type is best for me?

This question can only be answered after two other questions have been considered:

- What level of performance do you require from the mob of cattle in question?
- What is the nutritional value of the paddock feed?

Supplements can be divided into two broad groups, those that:

1. have protein as the main nutrient
2. provide energy and protein.

Protein supplements

Analysing samples of cattle dung using NIRS (near infrared reflectance spectroscopy) can help you to identify whether dietary protein is low enough that protein supplements will give a response. Knowing the nutritional value of the pasture means you can start feeding only when the protein level falls below that required to maintain liveweight, avoiding unnecessary feeding and making a supplementary feeding program more cost effective. Protein is generally not deficient if there is some green in the pasture.

Protein supplements are fed at low levels, usually less than 1 kg/head/day. They are designed to provide protein that is lacking in the diet of grazing cattle and so stimulate the rumen microbes so that digestion is more efficient and the animal's intake increases. This increase in intake results in more energy in the total diet. These supplements are usually given to reduce weight loss, and at best, will give only a slight weight gain.

Most of these supplements use urea as the main source of protein. Supplements in this group are:

- commercial blocks, dry/loose mixes and some of the liquid supplements
- homemade dry/loose mixes and urea/molasses roller drum mixes
- protein meals.

Protein and energy supplements

Supplements that provide both energy and protein are used when the minimum target is maintenance or a weight gain is desired. The level of feeding will determine the performance of the animal.

Supplements in this group include:

- some of the commercial liquid supplements
- whole cottonseed
- fortified molasses
- grain mixes
- protein meals.

Some of these supplements can also be used at higher intakes (e.g. greater than 3 kg/head/day) where substantial weight gain is required to finish cattle for sale to slaughter. The economics of production feeding needs to be carefully considered. You need to be sure of the market you are targeting and the anticipated price. In many cases it will be better to sell the cattle at a lower body condition than feed them. This would provide the added benefit of reducing stocking rate and thus making more feed available to the cattle remaining on the property.

Winter forage crops

An alternative to feeding supplements is to grow forage crops. Again the economics of growing forage crops needs to be carefully considered, taking into account the possibility of a complete crop failure, which has been common over the past 10–20 years. Generally, forage crops will only be economic if used to finish cattle. Carry-over summer forage may be useful for groups such as weaners, particularly in mild winters.

Roger Sneath has designed an Excel spreadsheet to calculate the economics of growing a forage crop. Contact Roger on 07 4669 0808 or roger.sneath@deedi.qld.gov.au

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Medics for pastures

Medics are annual legumes that grow in autumn, winter and spring. These legumes have yellow flowers that later form pods. The naturalised varieties are often called trefoil or burr medic and have a spiny seed pod. The hard coated seeds of annual medics allow them to maintain a presence in pasture over the years, given the right seasonal conditions. Medics are important contributors to soil nitrogen in southern cropping lands.

Trials carried out by CSIRO at Narayen Pastoral Research Station near Mundubbera investigated medics as winter cover crops on brigalow soils. An interesting outcome from the trials was the information on liveweight gain in cattle grazing the legume-supplemented pastures.

The legumes planted in the trial were lucerne (*Medicago sativa* cv. Hunter River) and three annual medics: snail medic (*M. scutellata* cv. Sava) and two barrel medics (*M. truncatula* cv. Cyprus and Jemalong). Yields and density of the three annual medics were highly variable over the trial, where establishment was successful in only 7 of the 19 years. Because of the hard seed, production levels are often fairly low in the second year after sowing because the seed coats have not broken down enough for the seeds to germinate. Medics need good autumn–winter–spring soil moisture in year one to produce an adequate seed bank. In following years, if there is good autumn–winter soil moisture, medics will be the most productive. Very good yields resulted in the trials when there were two consecutive years with good soil moisture.

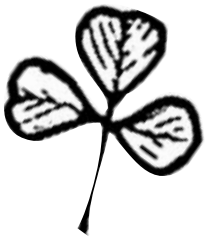
Although the legume yields were generally low, animals preferentially grazed the legumes during winter. The legumes were of high quality and animals were able to maintain their rate of weight gain during winter, whereas their counterparts on pure grass pastures generally gained at a much slower rate over the same period. Whenever the lucerne or medics were lush, an anti-bloat oil was added to water troughs to reduce risk of bloat.

Another trial, conducted at Roma, Warwick and Gayndah in the late 1970s, looked at the effects of medics on pasture yields. The medics used were *Medicago scutellata* cv. Robinson (snail medic) and *M. truncatula* cv. Jemalong (barrel medic).

In the dryland treatments of this trial, at Warwick and Gayndah, medics increased grass yields by 25–100%. This increase was equivalent to spreading 50 kg/ha/year of N fertiliser. Adding medics to grass pastures can lengthen the growing season and increase the total dry matter production of a pasture through winter and spring, and indirectly into summer, through the supply of N to the grass. Winter rainfall is the determining factor in the productivity of the medic pastures.

These trial results indicate that medics can contribute to beef production in the subtropics in wetter winters and are a worthy addition to any pasture plantings. Medics will not cope with a large body of standover grass going into winter. They need space to germinate and grow or they will not reach their potential. Grazing management will be required to open up the grass pasture in late summer and autumn to allow the medics to grow.

Clover leaf arrangement



Medic leaf arrangement

When to plant

April, May and June are the optimum months for planting. Under-sowing with a winter forage crop (20 kg/ha for oats) is a good option for establishing a legume seed bank before sowing a grass. On the Darling Downs, sowing a compromise of tropical grasses and annual medics together in March may be successful because of the milder late summer temperatures in this district.

What to plant

Aphids can affect medics though some varieties are more resistant to attack. Generally medics prefer neutral to alkaline soils. There are two main types: barrel medics and snail medics.

Snail medics

These have the largest pods and seeds of the commercial medics. Snail medics respond to cultivation and perform best where competition from other species is reduced or removed. They can be grown with winter forage crops, where they compete moderately well.

- Sava is an early-flowering variety. It can make good growth before winter although this may lead to reduced spring production. Winter-germinated Sava will be slow to grow but will produce well in spring.
- Silver (early-flowering) and Essex (mid-flowering) are new snail medic varieties with similar attributes to Sava. Both are well suited to southern Queensland conditions.

Barrel medics

More suitable for permanent pastures than snail medics, barrel medics are adapted to a range of fertile soils.

- Caliph is an aphid-tolerant variety bred from the variety Cyprus. Caliph flowers early and grows well on soils ranging from slightly acid red-brown loams to clay-loams and clays.
- Jester is an aphid-tolerant variety bred from

Jemalong. It is well-adapted to the clay soils in the subtropics.

- Paraggio is an aphid-tolerant variety. It will grow on a wide range of soils from hard-setting loams to cracking clays. It is the barrel medic variety most tolerant of powdery mildew.
- Sephi is an aphid-tolerant variety that performs well on clay soils.

Jemalong and Cyprus are not readily available, having been replaced by Jester and Caliph.

Other medics

- Toreador (*Medicago tornata x littoralis* hybrid) is an aphid-tolerant early-flowering variety that sets large amounts of hard seed. It should persist well in the dryer areas.
- Cavalier and Scimitar (*Medicago polymorpha*) are spineless burr medic varieties that lack aphid tolerance. They have performed quite well in southern Queensland.

Thanks to Brian Johnson, DEEDI Toowoomba, and Cam McDonald, CSIRO, for their assistance with this article.

More information on varieties:

www.dpi.qld.gov.au/26_17592.htm

References:

NM Clarkson, NP Chaplain and ML Fairbairn *Comparative effects of annual medics (Medicago spp.) and nitrogen fertiliser on the herbage yield and quality of subtropical grass pastures in southern inland Queensland*. Australian Journal of Experimental Agriculture, 1987, 27(2), 257–65.

CK McDonald, RM Jones and MW Silvey. Unpublished.

Crop-pasture rotations on a brigalow soil: effects of season and type of rotation on pasture and animal production. CSIRO Sustainable Ecosystems, Brisbane.

Slashing grass?

There is a lot of debate over whether or not slashing benefits pastures. Slashing is not a common practice on larger properties but it is often done on smaller properties, in many cases for reasons other than for improving the pasture.

Before slashing ask:

- Why are we doing it?
- Will it provide better grazing for stock?
- How much will it cost?

Some reasons for slashing are:

- Increasing mulch on the soil. The slashed grass needs to be in direct contact with the soil to add organic matter. Often the slashed material sits on top of the grass and acts as a mulch, slowing pasture recovery and not contributing to the soil organic matter. Is this better than burning? It depends on the pasture but a good fire can stimulate native pastures while a very hot fire can destroy pastures. The choice between slashing and burning will depend on the situation.
- Reducing the bulk of pasture. A large bulk of pasture can be a fire hazard but it can also be a valuable source of standover feed for the coming winter when it can be fed with a protein supplement. The value of the pasture as potential feed will have to be balanced against the potential fire hazard, taking into consideration the seasonal conditions.
- Promoting new pasture growth. If pastures are not grazed they can become rank and unpalatable. Slashing can promote new and more palatable pasture growth, but it is often better to vary stocking rates to reduce rank growth if possible. Studies researching the impact of slashing on productivity have had conflicting results, and vary with pasture species. Generally though, the cost of slashing outweighs the gains achieved in new pasture growth. Better grazing management is often the easier alternative.
- Managing annual weeds. Slashing can be a great tool in controlling weeds, such as thistles, that can establish on bare ground during variable weather conditions and compete with pastures. These weeds need to be slashed before they go to seed, otherwise the slasher will spread the weed seeds further afield and compound the problem.
- Managing woody weeds. Plants such as wild rosemary (*Cassinia laevis*) and some wattles

can be controlled by slashing when they are small, reducing the likelihood of having to undertake a major weed control program after the weeds become established. Several follow-up treatments will often be necessary to control the plants that re-sprout after the initial slashing.

- Establishing new pastures. New pastures can become dominated by annual weeds that take advantage of the disturbed soil. Slashing before these weeds flower will reduce moisture stress and competition for the new pasture. The new pasture may have to be spelled longer, however, to let it go to seed.
- Evening out variations in grazing. A paddock with a set-stocking rate will generally have grazed and ungrazed patches. Slashing will help to even up the pasture but a better option is to use a rotational grazing system to even out the grazing pressure on the pasture. In rotational grazing, stock are moved as a group through two or more paddocks on a regular basis (see page 7). This improves the management of the grazing pressure and gives pastures in the ungrazed paddocks an opportunity to recover.
- Making it look tidy. Many landowners who slash are really cutting the grass just to make it look tidy. They justify slashing by saying it puts mulch back into the soil. However, if the grass was left standing it would provide more habitat and protection for a variety of fauna that ultimately carry out the mulching as a natural process. A short pasture may look tidy, but it makes the soil more susceptible to evaporation and runoff than under natural pasture.
- Controlling blady grass. This grass is unpalatable so it is often slashed to allow other, more palatable, grasses to grow. For effective management of blady grass in pasture, the patches need to be slashed for a number of years as well as being fertilised and seeded with legumes.

Other tips for slashing and pasture management:

- Slashing by itself will not change long-term pasture composition. Burning native pastures, if managed carefully at the correct time of the year, will be more effective in favouring the germination and establishment of desirable pasture species. Grazing management can also change pasture composition.
- A bulky, low quality pasture can be slashed and baled, with the bales being used to rehabilitate bare or eroded areas on the property.
- Regularly sharpening the slasher blades will dramatically reduce the fuel used and time taken to cut an area. This is particularly apparent when slashing weedy grasses such as African lovegrass or giant rats tail grass.
- After slashing, always use a broom or compressed air to clean off the slasher deck so that weed seeds are not carried into clean areas. Preferably slash before weeds go to seed.

Slashing can be a valuable tool in pasture management in some situations, but use it for a good reason. In most situations, using stock to do the job will be far cheaper and less time consuming than slashing. Smaller paddocks marked out by electric fences provide better pasture management options than slashing.

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Barbed wire grass *Cymbopogon* species

Barbed wire grass species are widespread and common in eastern Queensland. This group of grasses is found mainly on lighter soils but the individual species prefer different habitats. Australia has seven *Cymbopogon* species. Some grow to 1.5 metres tall but the more palatable species are generally smaller than this.

Barbed wire grass (*C. refractus*) is usually found interspersed amongst other pasture plants and generally does not dominate. It is not a productive grass but can contribute useful feed after it is burnt. Most of the leaf grows as a thick tuft around the base and, if left to mature, the grass becomes woody and unpalatable. A grazing trial west of Kingaroy found that under set stocking the cattle kept the barbed wire grass short and it was not often seen in set stocked paddocks.

This grass is often confused with kangaroo grass. However, under close examination you can see that the florets point both up and down, looking like the barbs on barbed wire. In some districts barbed wire grass is also known as turpentine grass, due to the strong oily odour you can smell when the stems are crushed.

Another common species, *C. obtectus*, has silky hairs that are clearly visible when the grass is flowering.

An overseas relative of barbed wire grass, *C. citratus* (better known as lemon grass), is used in cooking and to add a lemon scent to various products.

While barbed wire grass is not a great fodder species, it is a worthwhile contributor to the biological diversity of our native pastures.

Common toxic plants in SEQ

Common name	Scientific name	Problem areas
Green cestrum	*Cestrum parqui*	Creek banks
Noogoora burr	*Xanthium pungens*	Creek flats
Mulga fern	*Cheilanthes sieberi*	Paddocks
Ellangowan poison bush	*Myoporum deserti*	Stock routes
Button grass	*Dactyloctenium radulans*	Stock yards
Liverseed grass	*Urochloa panicoides*	Stock yards
Mintweed	*Salvia reflexa*	Stock yards
Pigweed	*Portulaca oleracea*	Stock yards
Sorghum regrowth	*Sorghum* spp.	Stressed crops
Lantana	*Lantana camara*	Young shoots
Native fuchsia	*Eremophila maculta*	Young shoots
Darling pea	*Swainsona* spp.	Young shoots from rootstock

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Chemical control of purple-flowered weeds

Many of the common purple-flowered weeds are difficult to control with chemicals, so it is best to start by looking at why the weed is present on your land, and no, it is not always your neighbour's fault! Weeds often proliferate on overgrazing or drought-affected land, but some of these villainous invaders will appear no matter how good your property management is.

If it becomes necessary to use chemical control, there are a number of products registered for use on the purple-flowered weeds. These plants were described in *Beeftalk* Issue 30 Spring/Summer 2010.

Remember when using chemicals:

- Always read the label and adhere to all recommendations—registrations can change without notice, so always check before spraying.
- Make sure you have identified the weed plants accurately.
- Only spray plants that are actively growing and not stressed.
- Spray early—younger plants are usually easier to kill.
- Spray established blue heliotrope at flowering.
- Wear protective clothing.
- Be mindful of spray drift and the damage it causes.
- Observe withholding periods detailed on the label.
- Continue to inspect the site regularly for surviving plants, plants that may have missed the treatment or new plants, and carry out follow-up treatments.

Purple-flowered weed	Chemical	Spray rate
Blue heliotrope	Starane Advanced	600 mL/100 L
Heliotropium amplexicaule	Grazon Extra	500 mL/100 L
	Tordon 75-D	1 L/100 L
	Glyphosate (360 g/L)	1 L/100 L
Mayne's pest	Lantana 600	5 L/100 L
Verbena tenuisecta	Tordon 75-D	600 mL/100 L
Veined verbena	Kamba 500	470 mL/100 L
Verbena rigida	Lantana DP 600	500 mL/100 L
Purple top	Kamba M	470 mL/100 L
Verbena bonariensis		
Creeping lantana	Starane Advanced	300 mL/100 L
Lantana montevidensis	Hotshot	700 mL/100 L
Paterson's curse/salvation Jane	2,4-D Amine	250 mL/100 L
Echium plantagineum	Grazon Extra	400 mL/100 L
	Glyphosate (360 g/L)	500–700 mL/100 L

These recommendations are a guide only. Read the labels and comply with all requirements before using the chemicals.

The rates given here are for spot spraying. Consult the chemical's label for boom spray application rates. Most of the recommendations given here are in millilitres (mL) per 100 litres (L) of water. A dilution rate of 500 mL per 100 L equates to 50 mL of chemical in 10 litres of water.

These recommendations were sourced from:

Pest Genie: www.pestgenie.com

and

PUBCRIS: www.services.apvma.gov.au/PubcrisWebClient/welcome.do

Other chemicals are also available. For more information and recommendations, check with the above websites or your local agronomist.

Thanks to Ian Crosthwaite, agronomist at BGA Kingaroy, for his help with this information.

Grazing and timber production—Think about it and act

For most beef producers in SEQ, running a beef business involves managing the balance between trees and grass—it is said the Burnett has the highest per capita sales of Tordon in the world. Graziers in the Burnett don't swing a Tordon axe because they need the exercise or because they have a huge tax problem. They swing a Tordon axe because they get a return on the investment through improved grass growth and carrying capacity for their cattle enterprise.

But do graziers always take into account the inherent or potential value of the timber they treat? If they do, are they basing their decisions on an up-to-date understanding of the relative value of cattle and trees?

Figure 1 shows the change in the value of beef between 1980 and 2004, adjusted for inflation. While current prices for both store and fat cattle are reasonably strong, there has been a downward trend in the real price received. In 1994, just prior to the Helix contamination scare that sent prices tumbling, Jap Ox hit $3.20/kg dressed weight. A decade later, in what was considered a bit of a beef boom, the price of beef had strengthened to about ... $3.20/kg dressed weight. What are you currently receiving for Jap Ox? How much did $3.20 buy you in 1994 and what will it buy for you today?

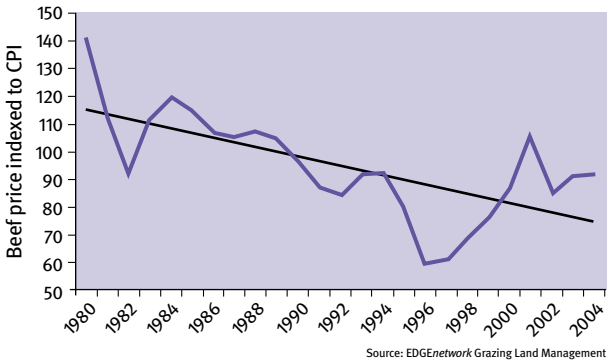

Figure 1: Cattle prices adjusted for inflation

Now try to recall what timber was worth in 1994. A-class sawlog were somewhere between $25 and $40/m³. What is timber currently worth? If you're selling A-class sawlog and not getting at least $100/m³ royalty, then you're probably selling to the wrong miller.

In previous editions of *Beeftalk* we've looked at legislation that impacts on timber management (issues 8, 18, 20 and 21), principles of native forest management (issues 11, 12 and 25), opportunities for developing forest plantations for timber and carbon (issues 13, 25 and 27), ways of integrating grazing and silviculture (issues 20 and 23) and silviculture training opportunities (issues 22 and 30).

But we're graziers, not foresters, aren't we?

Private Forestry Southern Queensland (PFSQ) recently analysed Regional Ecosystem (RE) data for SEQ and grouped REs dominated by commercial timber species into twenty forest types. They compared the area and extent of these forests prior to settlement with their current remnant and regrowth extent, specifically where they exist on freehold land (see figures 2 and 3).

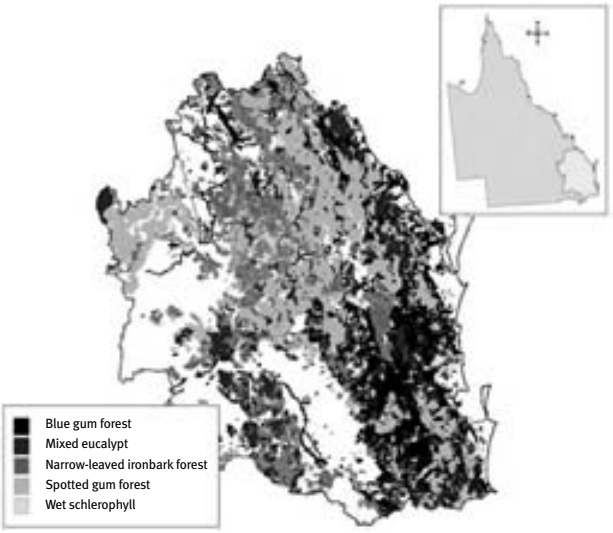

Figure 2: Pre-clear commercial forest types

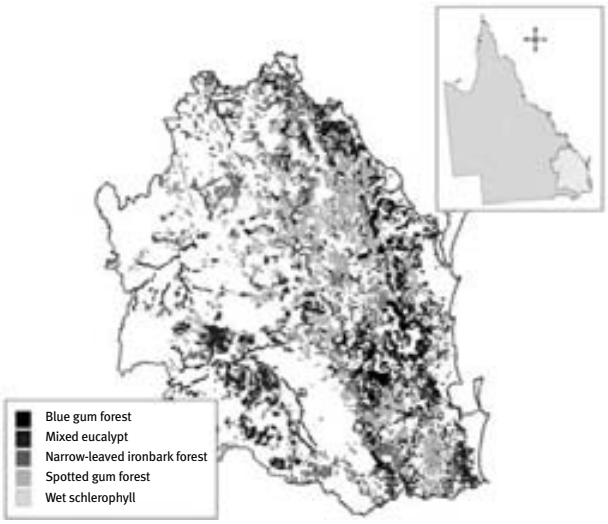

Figure 3: Remnant, private commercial forest types

The total area of the region is about 16.8 million hectares (from Gladstone and Banana Shires south to the border). Prior to settlement and development, about half of the region contained commercial forest types, and about half of this remains as remnant forest. Just less than half of these remnant commercial forests are on freehold titles larger than 20 hectares in size (about 1.7 million hectares). An additional 0.9 million hectares of regrowth forest

types (HVR) are on freehold land (› 20 ha in size). This represents a large, and potentially valuable, resource.

The vast majority of these remnant and regrowth forests are on country where grazing is the primary enterprise. How much of it is on your land?

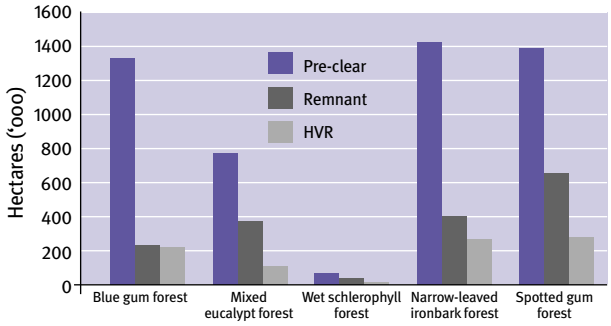

Figure 4: Area of broad forest types on freehold land larger than 20 hectares

How does this mean anything to us?

We tend to assume that the majority of hardwood processed in Queensland comes from the two million hectares of State Forests. Figure 5 challenges this assumption. However, 40–60% of sawlog has traditionally come from the private resource, with the current proportion being greater than 60%.

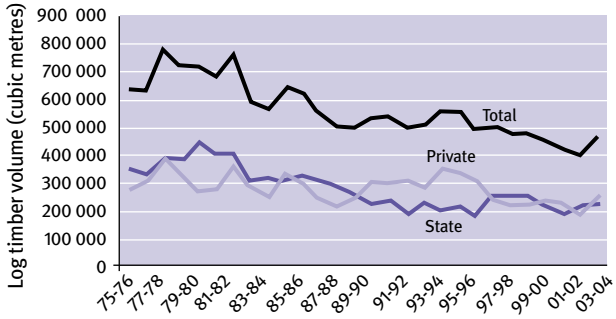

Figure 5: Log timber volume by year

The SEQ and Western Hardwoods Regional Forest agreements of the early 2000s mean that logging is being phased out of State Forests and will cease in 2024 (less than 13 years away). To compensate for some of this lost resource, the Queensland government has established about 12 000 ha of plantation over the last decade. Hancock Queensland Plantations, the new owner of the recently privatised Plantations Queensland, has been paid to establish another 8000 ha in the next decade.

There is concern that this plantation resource will not produce as expected, with some sites suffering significant tree death and others producing considerable timber fault. Where will the hardwood sector pick up a 90 000 m^3 per annum shortfall in resource?

Chances are it will come from forests that you own. Are you prepared to take advantage of this? How much wood do you have and what is its quality? What can you do to improve the productive capacity of your forests?

Is the private forest resource being managed productively?

In previous editions of *Beeftalk* we've had articles highlighting the need for managing native forests to improve their health and productive capacity. If your approach to native forest management in the past has been simply to put a miller into your paddock every decade or two, or to 'scalp' a paddock after buying it to cash in the timber, then you may be missing out on opportunities for future income.

Native forests need to be managed to produce timber. Trees need to be harvested when they've reached their optimum value (product and volume considerations), before they produce fault, drop to a lower value product or start impacting on regeneration. Only retain healthy trees, ones with good bole length and a healthy crown. Capture regrowth early and give it room to grow.

Plan your harvests. Harvest contracts with millers and/or contractors should cover all aspects of the silvicultural code of practice (for remnant forests), ensure product optimisation, cover loss of infrastructure and damage to retained trees and ensure the stand is left in a productive state post-harvest.

Remember

The relative values of grazing and timber are not the same today as they were in the past and this is likely to continue to change. Many things will impact on the relative values of grazing and timber including:

- projected shortfalls in supply from State native and plantation forests
- impacts of a price on carbon and on alternative building products (concrete and steel) and your beef enterprise (input costs and possibly emissions from cattle)
- harvest security of the private resource
- competition between retaining trees for wood and retaining trees for carbon sinks.

One thing for certain is that managing the balance between trees and grass will remain an integral part of running a beef business in much of SEQ—but where that balance lies will change.

Next time you're about to swing a Tordon axe into a tree, think about its current value and its future value, and not just about the grass it might replace.

Do your own field trials

Every day rural producers are bombarded with material promoting new fertilisers or biological treatments that promise to increase crop production or pasture growth or improve the health of your stock. As governments cut back on funding for independent research, it is often difficult to find unbiased information on products being sold. Many of the claims may be justified, but how can you know whether you will see these benefits on your property after spending your hard-earned money to buy the products?

To determine how these products perform on your property, you could conduct your own simple field trials.

Pasture and crop trials

1. Include an untreated control site. The area selected needs to be as similar as possible to the treated site and must be managed in the same way. Select an adjacent area with the same soil, aspect and ground cover.
2. Use several trial blocks. A single trial block is easy to set up and manage but for a more accurate picture of what is happening, several trial and control blocks are better. A suggested layout is:

Treatment 1	Treatment 2	Control	Treatment 1	Treatment 2	Control

   The treatment and control areas need to be well marked. Stakes will work, but if stock are to be grazing the area the stakes may need to be hammered down to ground level. Another way to mark plots is to bury short lengths of garden hose on end.

3. Decide what you are going to measure and be prepared to measure it accurately. Are you looking for an increase in plant density or kilograms of dry matter per hectare, greener pasture, improved palatability for stock, or increased crop yield? Relying solely on a visual assessment can be misleading.
4. Accurate record-keeping is a must. Records should include dates and rates of application as well as comments on weather, rainfall and temperature as these conditions can affect the outcomes of the trial.

Trials with animals

Similarly, trials can be done with animal treatments, such as for internal parasites, by comparing treated animals with untreated animals. It is important to apply the treatment to a range of animals, not just the best or worst in a mob. Treating every second animal as they move through a crush is an effective way of randomising the treated animals.

As with pasture and crop trials, accurate records must be kept. For livestock this will often be liveweight change, so accurate weights must be taken at least at the beginning and at the end of the trial.

Improving accuracy and benefit

Trials carried out over a number of years will cover a range of seasonal conditions and provide more reliable information.

Working together with other interested producers to conduct trials across a number of properties can make the process more interesting and accurate as well as providing benefit to more people.

When assessing the outcomes of your trials, take into account the total cost of the new treatment or management procedure. An increase in liveweight gain may not be sufficient to cover the costs incurred.

There are still funds available from MLA for groups to carry out property trials under the MLA's Producer Demonstration Sites initiative. Contact your local DEEDI beef officer with your ideas.

More ideas:

www.new.dpi.vic.gov.au/notes/crops-and-pasture/fertilisers-for-pastures/ag0204-using-fertiliser-test-strips-on-pasture

www.dpi.nsw.gov.au/__data/assets/pdf_file/0020/41636/Field_trials.pdf

Further information:

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Timely tips Autumn/Winter 2011

April–May

Dry season management

- Assess pasture quantity and quality in each paddock. Estimate its carrying capacity and how long you can carry that number of stock.
- Assess current stocking rates. Do stocking rates need to be adjusted to keep stock and, more importantly, country in good condition?
- Evaluate effectiveness and cost-benefit of winter supplementation program.
- Start your dry season management plan that was developed earlier. Stick to plan.
- 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, injuries or other problems e.g. to sheaths, legs. Cull as needed.
- Cull bulls that are older than seven years.
- Start dry season supplement program.

Breeders

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

Calves

- Brand. Use correct legal position.
- Ear tag. NLIS in correct position OFF ear (see *Beeftalk* 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

- Train weaners correctly to have:

1. less stressed animals and people
2. animals that are trained to eat supplements, know the yard layout and how to work through it, and are more amenable to learning paddock mustering control
3. animals that are usually calmer and quieter, more productive over time and more saleable
4. the opportunity to identify problem animals sooner and make management decisions about their future.

- Wean early. This instantly reduces stress on cows.
- Wean and weigh calves. Identify mothers of poor calves.
- Draft off any small weaners (less than 150 kg) and give them special care.
- Feed weaners good quality hay in yards. Feed out of racks if possible to minimise wastage. Introduce weaners to supplements.
- Ensure an adequate supply of good clean water.
- Weaner yards and paddocks should be in good condition with plenty of shade.
- Consider coccidia control measures if weaners are going to be hand-fed for considerable time in the yards.
- Vaccinate with booster 5-in-1 or 7-in-1.
- In tick infested areas, vaccinate for tick fever. If possible, do not administer more than one vaccine at a time. Immunity produced by the tick fever and other vaccines may be more reliable if these vaccines are administered at different times. As a general rule, administer tick fever vaccine at least two weeks after any other vaccine.
- Wean into best paddock available.

Assess mating and marketing program

- Do my herd mating practices give me 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 reasonable number of years?
- What criteria do my cattle have to fit to be eligible for these markets?
- Are my cattle the best type for the most profitable markets?
- Could my animals be suitable for other types of markets?
- What inputs do I have to provide to make my cattle suitable for a different market? Is it going to be worth it?
- Have the markets I have supplied in previous years changed? Are there new legal requirements?
- Were my animals produced for the least financial, labour and environmental cost?

Timely tips Autumn/Winter 2011

- Would changing my cattle give me a greater financial reward? It costs a lot of money to change over to new breeds etc.

Parasites

- Start strategic dipping for pre-winter treatments.
- If resistance is a problem, consider using DEEDI Tick Resistant Survey Kit available from DEEDI offices or phone DEEDI on 13 25 23.
- Check worm burdens in weaners (for WormCheck, call DEEDI on 13 25 23). Treat if necessary.
- Treat for buffalo fly to reduce numbers that may over-winter.

Business plan

- Conduct tax planning meeting with accountant.
- Assess success of last 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?

Pastures

- Start preparing land for sowing improved pastures in spring.

June–July

Dry season management

- 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 how to improve your pasture quality.

Breeders

- Pregnancy test 6–8 weeks after bull removal.
- Cull breeders from main mob (on temperament, age, defects and non-pregnancy). Truck to saleyards.
- Vaccinate breeders (e.g. for leptospirosis).
- Assess mating program and plan changes if necessary. Consider options for breeding programs e.g. crossbreeding.
- Maintain check on pregnant breeders, especially maiden heifers and first-calf heifers.
- Order NLIS tags.

August–September

Dry season management

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

Bulls

- Check bulls for soundness and determine numbers for next breeding season.
- Consider type of bull needed to produce type of calves best suited for your potential markets.
- Source and evaluate potential bull supplies.
- Check young, home grown bulls as potential sires.
- Annual vibriosis and three-day sickness booster for bulls at least four weeks prior to joining.
- Obtain advice on breeder vaccination programs e.g. pestivirus vaccination program.

Breeders

- Assess your maiden heifers. Will they be heavy enough to mate?
- 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 is a problem.
- Check late winter calves for scrub ticks.

Pastures

- Consider burning native pastures every 2–3 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 a suitable time to plant pasture.
- To maintain or improve pasture composition,

ensure paddocks get at least one late spring or summer spell every fourth year.

Property maintenance

- Check fences and water facilities in breeding paddocks.
- Check river and creek crossings before next wet season.
- Maintain fire fighting equipment, extinguishers etc and ensure fire breaks are maintained and serviceable.
- Clean around buildings and check that gutters are free of leaves.
- Ensure all personnel know what to do in case of fire. Do they know who to call? Discuss the 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? This is a legal responsibility.
- 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.

Speargrass grazing guidelines

Thirteen years of intensive grazing research into maintaining the profitability and sustainability of Queensland's coastal and sub-coastal native black speargrass pastures has been captured in a recently published 32-page book, 'Keeping your speargrass pastures productive – don't overgraze'.

The full colour book is a must for both established and new landholders as it spells out the long-term impacts of grazing management options for soil, pasture and animal productivity on black speargrass (*Heteropogon contortus*). DEEDI principal rangeland scientist Dr David Orr and retired senior principal scientist Dr Bill Burrows co-authored this free publication.

The Galloway Plains grazing study, located in the Calliope district and funded by Meat and Livestock Australia from 1988 to 2001, concluded that exceeding a stocking rate of 4.0 to 4.5 hectares per steer was not environmentally sustainable.

Dr Orr said the evidence clearly indicated that continuous grazing that exceeded 30% pasture utilisation, even when the black speargrass had been oversown with Seca stylo legume, resulted in lower animal productivity and land degradation.

'Sowing legumes into native pastures should be used for improving the growth rate of steers rather than carrying more stock. Animal performance from the recommended 4 ha/steer stocking rate on the legume augmented black speargrass pasture attained an average 175 kg liveweight/head/year,' he said.

'By increasing the stocking rate to 2 ha/steer the average gain was 110 kg/head/year, which certainly reflected a higher earning capacity, but at the end of 13 years the reality was that the steers were actually achieving far less than the 110 kg/head/year.'

Dr Orr said a well-managed black speargrass pasture, combined with Seca stylo, consistently delivered a 30–50 kg/head/year liveweight gain advantage over straight black speargrass coastal woodland grazing land.

The free book is currently available through the DEEDI office, Parkhurst. Phone 4936 0211 for a copy.

If you would like a copy of *Beeftalk* mailed to you, please complete the following form and send to Editor, *Beeftalk*, DEEDI, PO Box 118 Gayndah 4625 or Email ian.mcconnel@deedi.qld.gov.au

Name: .....

Address: .....

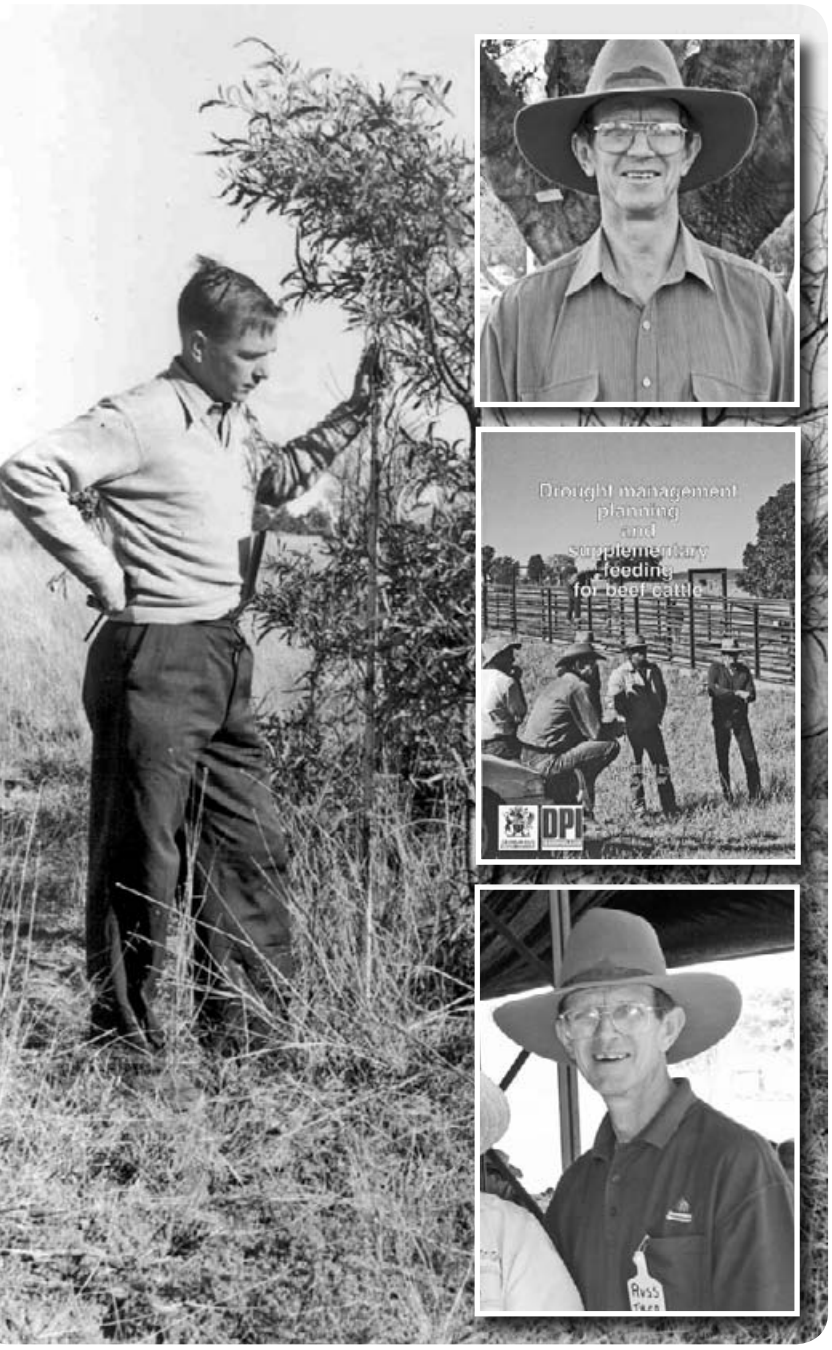
Postcode: ..... Shire: ..... Property Number: ..... No. of cattle: .....

Phone: ..... Fax: ..... Email: .....

Which of the following best describes you?

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

Farewell to Russ Tyler



In April Russ took down his coveted 'Beef Cattle Husbandry' sign from his office door at Brian Pastures Research Station. A colleague summed it up well when he said that Russ's wit and wisdom will be sadly missed from the department. Russ has been the mainstay of the *Beeftalk* magazine over the last 15 years.

In his early years Russ managed Swans Lagoon Research Station near Ayr. Testament to Russ's congenial management style staff retain many enjoyable memories including Russ's legendary Christmas parties held on the banks of the Burdekin River.

Russ has helped beef producers far and wide with getting through droughts and improving management practices. He has been a great mate and reliable help to the Customer Service Centre, fielding countless enquiries.

Russ's nutrition knowledge and management skills were well recognised when he was asked to lead the EDGE nutrition workshop series that ran successfully across Queensland.

I am sure all our *Beeftalk* readers would like to join us in wishing Russ Tyler the very best with his new adventures, which include spending more time with Gaye, his kids and grand kids. Russ, we all look forward to seeing you around the ridges of Gayndah.

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