



Beeftalk

Taking stock of your future

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

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editorial

Many graziers across SEQ will be looking forward to summer after what has been a mild winter. With good August rains across most of the region the country should be well prepared for the growing season as temperatures rise.

This edition of *Beeftalk* has some great articles on how to make the most of a good season, including developing pasture, purchasing seed, and preparing for the breeding season. A research update from the *Wambiana* trial points out the importance of managing grazing pressure during good seasons to ensure pasture health during the inevitable dry season.

This edition also covers a range of diseases to watch out for in your herd, especially as we enter the breeding season. Have a good read of the articles on vibriosis and trichomoniasis, pestivirus and tick fever to find out how to protect your herd. For those of us with horses, Ron Glanville provides some perspective on the Hendra virus.

The late winter rain has stimulated the growth of a great many blue and purple flowering weeds, and Damien O'Sullivan has put together a great article on identifying the different species. He has also written a very useful article on identifying grader, thatch and giant rats tail grasses. No doubt once you've read the articles you will recognise a few of these weed species along the roadsides. Keep an eye out across your property too.

I encourage all producers to read Roger Sneath's 'Cost of production' article. Have a go at calculating cost of production for your enterprise and you may find some areas for savings! An article on how some beef producers are using NLIS tags and readers should give you some ideas on how to make best use of the tags in managing your herd.

This is my first edition of *Beeftalk*, as Russ Tyler has handed me the reins. Russ is still very active within the *Beeftalk* committee and has provided valued support in pulling this issue together. I hope you find much that is helpful in managing your beef enterprise.

Happy reading!
The Ed



Preparing for the breeding season



As the traditional breeding season for cattle in south-east Queensland approaches preparing our stock to maximise the pregnancy rate should be an important part of our planning.

Bulls

Bulls should be in good condition (condition score 3) or better going into the joining season. Bulls that are in poor condition will produce smaller amounts of lower quality semen. Sperm production takes up to eight weeks so bulls must be in good condition at least two months before the start of mating.

If you are buying new bulls, ensure they have been tested and ideally have an ACV Breeding and Soundness evaluation. New bulls must also have time to deal with the stress of going through a sale ring, transport and acclimatising to a new property. The stress caused by these factors can be detrimental to semen quality and allowing the bull two months to acclimatise before joining will help ensure high quality semen is produced when mating. All other herd bulls should be evaluated for soundness and ideally semen tested every 2–3 years.

Vaccinate maiden bulls for Vibriosis (see article on Vibrio and Trichomoniasis in this edition) twice 4 to 6 weeks apart with the second dose being given at least six weeks before mating is due to commence. All other herd bulls should be vaccinated annually. Vaccination of bulls in the month or two prior to mating is not advised as research has shown that it can temporarily suppress semen quality, thus calf-getting ability.

Females

Good weaning management and appropriate pasture

utilisation are key aspects of having cows calve in condition score 3 or better. Having your females in good condition will maximise the ovulation rate leading to a higher pregnancy rate.

Lifting the condition score from 2 to 3 can increase pregnancy rates by as much as 17%!

If females are not cycling because of poor body condition, targeted and timely nutritional support may assist in recovery of cyclicity; however, the cost-benefit must be carefully assessed before taking this option. Improving cow condition in late pregnancy or during lactation requires high quantities of energy and protein. A lactating cows tend to put a lot of the extra nutrition into her calf so improving body condition during this time can be difficult. A supplement of at least 3 kg per cow per day of fortified molasses or whole cottonseed is required.

Management of your female herd for pestivirus and trichomoniasis should be considered, see articles in this edition.

While joining rates will vary depending on terrain and paddock size, sound, healthy mature bulls in good condition can quite easily cover 50 cows in a six week joining season. If the joining rate is too high bulls will fight more often leading to a higher incidence of injury. Checking the breeding herd during the breeding season to see if the number of females cycling is decreasing is the easiest way to check if a bull is working or not.



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The Creeping Lantana Handbook

The Creeping Lantana Handbook, originally published by the Creeping Lantana Action Group in 2001, has been updated and reprinted. The new edition documents the results of the original three-year project funded by Natural Heritage Trust as well as more recent work funded by the Australian Weeds Research Centre.

Initially project ecologist Chris O'Donnell reported on the ecology of creeping lantana as well as methods for controlling and managing infestations in a variety of situations.

Recently Chris revisited the trial sites on Brian Pastures Research Station to evaluate how

effective the competitive grasses were after 12 years. The results of this recent work are in the new book.

Copies of the book are available free from:

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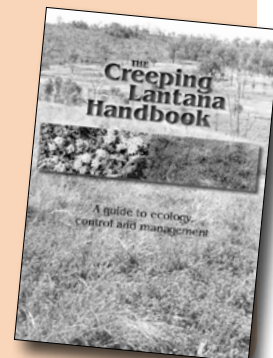
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Putting crossbreeding in perspective

There are a number of reasons why beef producers could consider crossbreeding rather than traditional straight-breeding programs for their beef enterprises.

The first of these is 'grading up' from one breed to another. This has rather limited opportunity other than for those who are establishing new breeds of cattle.

The other two reasons are to combine the attributes of two or more breeds to produce an end product that fits market requirements and/or to take advantage of hybrid vigour.

Combining the attributes of two or more breeds

The first step in deciding whether or not to embark on a crossbreeding program is to clearly define the production levels in your current herd for all the economically important traits in your herd.

The next step is to determine what production levels are needed for each of those economically important traits, to meet the requirements of the market you are aiming for.

By looking at where you are and where you need to be, you can determine the appropriate breeding objectives for your herd. Generally, these objectives can be met either by selecting within the current herd or by introducing new breeds into the herd. In this role, the introduction of new breeds merely provides a 'quantum leap' in changing the genetics of the herd. Such introductions would still need to be associated with an ongoing selection program to continue to make genetic improvements.

Taking advantage of hybrid vigour

Hybrid vigour is the production advantage that can be obtained from crossing breeds, or strains, which are genetically diverse. The new combinations of genetic material can lead to production advantages over and above the average of the two parent breeds or strains. To be of economic advantage, the new production levels need to be above those of either parent strain or breed – otherwise you are better off sticking with the superior parent line.

Hybrid vigour tends to be greater for traits – such as fitness or fertility traits – which are less likely to respond to conventional selection. For example, the level of hybrid vigour achievable for fertility traits is likely to be double that which might be obtained for growth or carcass traits.

Steps in establishing a crossbreeding program

Producers should not look at getting involved in a

crossbreeding program simply because it seems like a good idea. There are a number of steps that need to be followed in setting up a crossbreeding program.

- Define your current situation in relation to markets, breeds, nutrition, environment and management.
- Define what market, or markets, you are aiming for.
- Define the management and nutrition levels it is possible to achieve in your environment.
- Decide which breed types will perform best in relation to your desired production traits.
- Set out a long term breeding program – the final crossbreeding system may take up to ten years or more to achieve.
- Stick to your plan once it has been established.

The 'costs' of crossbreeding programs

The old adage that there is 'no such thing as a free lunch' was never truer than in the development of crossbreeding programs.

Crossbreeding programs inevitably lead to greater demands in terms of management skills, physical resources and the feed requirements needed to sustain any production gains through hybrid vigour.

A crossbreeding program needs careful planning, as the full benefits are not likely to be achieved for up to ten years after the program is put in place. Thus, you will need to be dedicated to mapping out a long-term program and sticking to it.

Crossbreeding can pay

Crossbreeding still has a very important role to play in the beef industry. It has certainly played a major role in some of our competing industries, such as the poultry and pig industries. These industries have looked very hard at what their market requirements are, and recognised that all the requirements cannot necessarily be met from one breed.

The same applies in the beef industry. Whether it is to combine the characteristics of different breeds or to take advantage of hybrid vigour, there is a role for crossbreeding – provided that crossbreeding programs are aimed at meeting market requirements.

Crossbreeding must not, however, be seen as an end in itself. Crossbreeding and selection should always be weighed up against the costs involved.



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Control of vibriosis and trichomoniasis

Vibriosis and trichomoniasis are prevalent venereal diseases of the extensive cattle herds of northern Australia and are characterised by causing low fertility in heifers. These diseases present a similar epidemiological pattern. It is not uncommon for both diseases to exist on the one property and even in the one animal.

For practical purposes, infection is only transmitted venereally for both diseases. In endemically infected herds the fertility of cows may be only slightly below normal, but infertility is seen to a greater degree in each successive group of heifers that are mated. Bulls carry both organisms in the prepuce and there is good evidence that permanent infections are more common in older bulls.

Vibriosis

Caused by *Campylobacteriosis fetus* type 1 and subtype 1. Disease is known as Campylobacteriosis but for obvious reasons is still referred to as 'Vibrio'. Infection causes no outward signs of illness. In females there may be increased vaginal mucus for a short time, which may be cloudy. Repeated return to service occurs but this is not normally noted under extensive conditions. It is more usual to find a low level of conception and a widened period of conception when pregnancy diagnosis is carried out. After a successful conception up to 10% of females can abort, most commonly at 5 to 7 months of gestation.

Permanent changes can occur in the oviducts in some cows leading to permanent infertility.

Infected females develop a resistance to the disease over time so that where the condition is endemic the overall disease rate drops, but reinfection can occur. Heifers exposed to infected bulls will show the highest rate of infertility within a particular herd.

A high proportion of heifers return to service for 3 to 5 months and eventually become pregnant. In controlled mating herds the return to cycling may be after the bulls have been removed.

A variable number do not become pregnant. Pregnancy diagnosis should be used to eliminate these animals because they are reservoirs of infection.

Heifer vaccination can lead to significant improvements in fertility in infected herds. However, there are often practical difficulties in extensive herds in following the procedures which require two pre-mating vaccinations to be given 6 weeks apart, with the second dose being given about 6 weeks before mating. An alternative program for heifers that are sexually mature is to give a single 5 ml dose of Vibriovax (CSL) 6 weeks before mating.

Bulls can be transiently or chronically infected. There

appears to be no natural immune response in the bull. Bull vaccination involving two doses 4 to 6 weeks apart with annual revaccination has been shown to clear infection and greatly reduce their susceptibility to reinfection.

Recommended control measures

- Either give heifers two pre-mating vaccinations at 12 and 6 weeks before mating, or give heifers that are sexually mature a single 5 ml dose of Vibriovax (CSL) 6 weeks before mating.
- Join maiden heifers only to maiden bulls.
- Test for pregnancy and foetal ageing after joining maiden heifers. Eliminate those that are not pregnant and likely to be reservoirs of infection. Also remove the less fertile animals that conceived late as indicated by foetal ageing testing.
- Vaccinate maiden bulls twice 4 to 6 weeks apart, with the second dose being given 6 weeks before mating is due to commence.
- Vaccinate all herd bulls annually.
- Where possible, cull bulls at 6 to 7 years of age.

Trichomoniasis

Trichomoniasis is a venereally transmitted disease of cattle caused by *Trichomonas fetus*. It is prevalent on extensively managed properties in Queensland.

Conception rates of heifers in one study improved from 40% to 95% when uninfected bulls were used. Other studies have estimated losses of up to 17.5%. Abortions occur in the first five months of gestation and have the effect of lengthening calving patterns. Infections do not normally persist for more than a few months in non-pregnant females.

Chronic uterine infections and mummified foetuses are seen in herds with trichomoniasis. Sometimes an odourless discharge with particles of mucus/pus is seen.

In bulls the organism lives in secretions around the penis and prepuce. Older bulls do not readily eliminate infection and are therefore more significant in perpetuating the disease. There is some evidence that young bulls (under 4 years) are resistant to infection.

Recommended control measures

- Join maiden heifers only to maiden bulls or at least to bulls less than 4 years old.
- Eliminate non-pregnant heifers using post-joining pregnancy diagnosis.
- Consider other control measures that have been used successfully in more intensive herds, such as:
 - Destocking/restocking
 - Using artificial insemination rather than bulls

- Operating a two herd system – exposed/unexposed
- Removing infected bulls and providing cows with sexual rest for 90 days.

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Pestivirus – the what and how!

Pestivirus, or bovine viral diarrhoea virus (BVDV), is a significant disease problem for beef and dairy producers. It is most commonly noted in herds rather than in individual animals by factors such as:

- decreased conception rates – less animals conceiving
- increased abortion rates – less calves being born
- stillborn or premature calves that die soon after birth
- unexpected illnesses or deaths in weaners and yearlings.

The main cause for concern is when breeding females become infected for the first time during pregnancy. If a non-pregnant animal becomes infected with BVDV it may show some signs of sickness but will recover and produce normally. However if a cow become infected during mating, the virus can disrupt ovulation and fertilisation. During pregnancy, the virus can cross the placenta and infect the foetus causing abortion or the birth of a stillborn calf, a deformed calf that dies soon after delivery, or a calf that survives as a ‘persistently infected’ (PI) animal.

BVDV is spread through a herd by PI animals, which are the progeny of cows that first became infected with the virus between days 20 and 150 of gestation. At this stage of gestation the foetus does not recognise the organism as a foreign virus. The calf is then born carrying the disease and able to infect other animals.

Around three-quarters of PI animals develop mucosal disease and die within 18 months. When this occurs, they are seen as ‘poor doers’ succumbing to many illnesses due to their weakened immune systems. Many PIs show no visible signs of infection and will appear ‘normal’ before they develop mucosal disease.

A PI animal will spread the virus only through direct contact with its secretions (mucus, saliva, blood, urine, semen, faeces etc). The virus can survive for many hours in the environment if conditions are favourable.

There are five main control measures for BVDV. In deciding which control method to utilise, it is important to first determine your herd’s BVDV status. Your local veterinarian can arrange the appropriate blood testing.

Use ‘auto-vaccination’

If BVDV is currently in your herd and there is a risk females may become infected around mating time,

you can reduce the impact by utilising animals that have been tested as PIs. Browse heifers with a PI animal so that the heifers can become infected and build up immunity before being mated. Ideally, the heifers should still be tested before mating to determine whether they have immunity. The rate of infection can be quite slow so not all exposed animals will become infected.

Great care must be taken to ensure the PI animals do not have access to breeding females during mating. A common mistake is to put bulls into the heifers paddock and forget to remove the PI.

Adopt biosecurity and quarantine measures

If your herd is currently negative for BVDV, you can choose to adopt a ‘closed herd’ strategy:

- Buy in very few animals to reduce the risk of bringing in PI animals.
- Test all animals that are brought in to ensure they are not PI.
- Avoid buying pregnant cattle because there is no test for determining if a foetus is infected.
- Vaccinate cattle that have a high risk of contact with neighbouring cattle or that are going to another property and might return with pestivirus infection.

Detect and remove all PIs

You may choose to test all cattle and remove all PIs to reduce the risk of infection. It can take several rounds of testing to discover all PIs.

Vaccinate

A timely and planned vaccination program can be directed at cattle at risk of becoming infected. This will provide short term immunity; an annual booster will be required to ensure immunity in subsequent seasons.

Test endemic herds

If pestivirus is endemic within your herd and the likelihood of heifers having come in contact with the virus is high, you may choose to test the females before joining and only vaccinate groups that have low numbers of animals with immunity.

Further information:

Visit www.bvdaustralia.com.au or talk to your local veterinarian

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Great rains – so look out for tick fever!

The good rains last summer and autumn produced one of the best seasons we have seen for many years but it also caused an increase in cattle tick numbers. Many producers reported having to dip cattle during autumn due to a build up in tick numbers. Following on from this it is highly likely we will see an explosion in tick numbers in spring and summer this year and a consequent increased risk of tick fever. Years of below-average rainfall have reduced herds' exposure to cattle ticks and immunity to tick fever.

Not all ticks carry the tick fever organism but a bite from one infected tick is enough to cause tick fever. When used properly tickicides help reduce the risk of tick fever by controlling tick numbers but they do not eliminate the risk of tick fever. The only sure way to control the disease is by vaccination.

Protect homebred weaners

If you are in a tick area do not assume your calves will develop immunity to tick fever through natural exposure to ticks. Eighty per cent of all tick fever outbreaks occur in homebred cattle. Protect your investment and vaccinate your cattle as weaners. This will ensure immunity against all three tick fever organisms when these cattle are most at risk as adults.

Calves suckling cows that have antibodies to tick fever will get immunity from the colostrum. This immunity needs to be topped up with a vaccination at weaning.

Vaccinate introduced cattle

As producers aim to build up cattle numbers again, demand for store cattle is likely to be very high. This may mean sourcing cattle from different areas or even buying in different breeds. Both of these factors can affect the risk of tick fever.

All cattle introduced to a property in the tick infested area should be vaccinated irrespective of the tick status of their property of origin. Cattle from a tick-free area are fully susceptible to tick fever. Many cattle from tick-infested areas will also be susceptible.

Immunity only starts to develop three weeks after vaccination and, ideally, you should vaccinate cattle at least two months before introducing them to your property. However, circumstances often dictate that animals are vaccinated only on or shortly before arrival. In these situations there is a real risk of tick fever occurring before protection from vaccine is established. Cattle from tick free country need particular attention during this period.

Be vigilant if changing breed

Many producers are decreasing the Brahman content in their herd in the hope of meeting specifications for some of the more specialised markets. British and European breeds carry more ticks AND are more susceptible to tick fever than Brahman breeds and their crosses, so any decrease in *Bos indicus* or Brahman content in your herd will increase the risk of tick fever.

Having said this, never assume that Brahmans are immune to tick fever. There have been a number of cases where Brahmans have succumbed to babesiosis and, more particularly, to anaplasmosis.

Remember your bulls

Bull breeders who sell within or into known tick areas should consider vaccinating their bulls, preferably as weaners or yearlings.

Buy vaccinated bulls whenever you can, particularly if the bulls are coming from a tick free property. Alternatively, vaccinate them and leave them outside the tick area for two months if possible.

Vaccinate bulls from a tick-infested property on purchase unless you are sure they have been vaccinated prior to purchase.

One shot usually provides life-long immunity. However an occasional animal will not develop immunity to one or more of the three tick fever organisms in the vaccine. Considering the value of bulls, giving them a second shot is good risk management.

A sound strategy would be to vaccinate bulls as weaners and again several months before they go into work or sale.

Order tick fever vaccine

Tick fever vaccine is a 'live' vaccine that mimics natural infection. It is available in two forms:

- Standard chilled vaccine – has a shelf life of four days after it is despatched from the Tick Fever Centre, and
- Combavac 3-in-1 live tick fever vaccine – a frozen vaccine which can be stored for up to five years in liquid nitrogen, but which must be used within eight hours of being thawed.

Tick Fever vaccine can be ordered by phoning 07 3898 9655. Orders placed before 10 am will be dispatched the same day.

The chilled vaccine is available in packs of 10, 20, 25, 50 and 100 doses, while the frozen vaccine comes in 25 or 100 dose packs.

Administer the vaccine as 2 ml injected subcutaneously (under the skin), preferably at the base of the neck.

Over the last three years, Meat & Livestock Australia has funded a project aimed at making the frozen vaccine easier to use. Despite considerable effort, attempts to extend the post-thaw shelf life of this vaccine beyond eight hours have met with limited success. The frozen vaccine must still be stored at ultra-low temperatures in liquid nitrogen; storage in a household deep freezer is not an option. The frozen vaccine continues to appeal mostly to the larger and more remote cattle stations.

We are currently researching ways to extend the shelf life of the standard chilled vaccine beyond four days. Early indications are that this might

be feasible. An extension of even one day will be helpful for remote properties or when weather conditions delay yarding.

Further information:

Tick Fever Centre
Biosecurity Queensland
280 Grindle Road Wacol Qld 4076
Phone: 07 3898 9655 Fax: 07 3898 9685
Email: tfc@deedi.qld.gov.au

DEEDI on 13 25 23 or visit
www.biosecurity.qld.gov.au and search for 'tick fever'

Perspective on Hendra virus



It's Friday afternoon and we're sweating on another Hendra virus rule-out. These things always seem to happen on Friday afternoon, and this one sounds like it could definitely be Hendra. The result comes in and, once again, like it is 99 times out of 100, it's negative. Thank goodness!

Ninety-nine out of 100. Yes, those are the odds. At Biosecurity Queensland we currently test samples from around 200 suspect Hendra cases per year, and over the past few years we've only had two positive new cases each year. This is out of a horse population in the at-risk areas estimated at about 200 000.

If Hendra infection in horses is very rare, then why is there so much concern? In terms of diseases that kill horses it is way down the list, and similarly for diseases that kill people.

I suppose the answer lies in the fact that statistics can only tell part of the story. Many people in Queensland have a very close relationship with their horse. There is no other disease I'm aware of that you can catch from your horse that can kill you (aside from maybe rabies, and Australia is currently rabies-free). Hendra's case fatality rate in people to date is higher than 50 per cent.

It can also strike virtually anywhere you find flying foxes, including parts of New South Wales and Victoria. We know the disease can be transmitted from horses to humans, but there is no evidence that it can be transmitted directly from flying foxes to humans.

Finally, the people most at risk are those you rely on to care for your horse when it is sick. Most cases in people have been veterinarians or people assisting veterinarians and it's pretty hard to pick a Hendra virus case from a range of other horse ailments.

The most recent fatality, Alister Rodgers, BVSc, was

a colleague I knew personally, having worked with him in the late 1980s on tuberculosis eradication in north-west Queensland. Having two colleagues tragically pass away over the course of 12 months has really been a wake-up call for the veterinary profession in Queensland. Reactions have varied from wanting to have nothing to do with horses to a 'call to action' for enhanced education and research.

So what can we do about Hendra?

An enormous amount of work has gone into Hendra research since the original 1994 outbreak, but there is much more to do. Key areas being worked on include gaining a better understanding of how the virus operates in bat populations and how horses get the virus, and developing a horse vaccine.

Despite this, it might surprise people to know that we actually know enough now to prevent human infection. However, this requires a culture change on the part of the people at risk.

All people who have become infected to date have caught the disease from infected horses before the disease was diagnosed in those horses. So, the biggest risk period is when people are handling sick horses, whether or not they suspect Hendra virus infection. And remember, the symptoms of Hendra virus in horses are so varied that if you try to pick a Hendra case based on clinical signs you are likely to get it wrong.

So this is why we need changes in our basic routines and practices around horses.

Remember when AIDS became a big issue? Doctors and dentists starting wearing masks routinely; footballers were ordered off the ground if they were bleeding. A similar culture change is required to keep people from catching Hendra virus.

We know that Hendra virus is not easy to catch; that is, high levels of exposure to infectious material

seem to be required. So if vets start using basic protective equipment routinely, and others who handle horses also carry basic equipment and wear it if a horse appears sick, then Hendra infection in people should largely disappear.

As for horses, a vaccine is being worked on as a high priority. However, it is still a long way off, and how many people will actually use it for a risk that we know is low? We also know it may not remove the risk entirely, especially for vets.

In the meantime, there are practical measures people can take to reduce contact between horses and infectious material from flying foxes.

There has been much debate about the role of flying foxes in this disease, but culling flying foxes is not the answer for a number of reasons. Flying foxes are an important part of our natural environment. It's simply not possible or feasible to cull them – they are widespread in Australia and they fly – if you

disturb them at one place they'll just fly back in from somewhere else.

Most importantly, it's just not necessary because there are effective steps people can take to mitigate the risks of disease transference between flying foxes, horses and humans.

In fact, culling flying foxes could actually make the problem worse by further stressing populations and causing increased excretion of the virus.

Learn more about this intriguing, deadly disease and what you can do to protect yourself and your horses on the Biosecurity Queensland website.

Further information:

Web: www.biosecurity.qld.gov.au

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Using fire to manage lantana

Lantana is a significant weed in south-east Queensland. Lantana impacts on the grazing industry by reducing pasture productivity, hampering access to country, and causing stock poisoning. Management is usually difficult, can be costly, and requires the use of a range of control strategies.

Fire can be a useful tool for managing lantana, but results can be highly variable. Good results have been achieved in forest country where fire is used regularly over a long period of time.

Bauple forestry fire trial

A fire trial has been set up in state forest near Bauple to evaluate the effect of fire on forest dynamics. This trial has three treatments including:

- fire exclusion since 1946
- annual, low intensity, winter/spring burns since 1952
- triennial, low intensity, winter/spring burns since 1973.

This work has looked at the impact of fire on forest dynamics (particularly understorey dynamics) and timber production and there have been some useful results regarding the effectiveness of using fire to manage lantana.

Impact of fire on lantana

As can be seen in figures 1 and 2, regular fire has kept the population of lantana low compared with unburnt conditions. Figure 2 also shows that the population of lantana had started to decline in the unburnt treatment after logging in the early

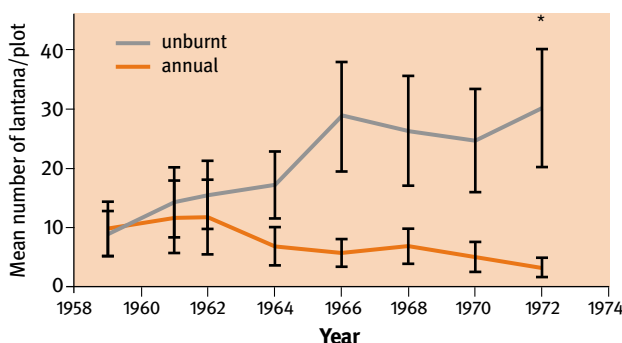


Figure 1. Impact of fire on lantana pre-logging in 100 m² monitoring plots.

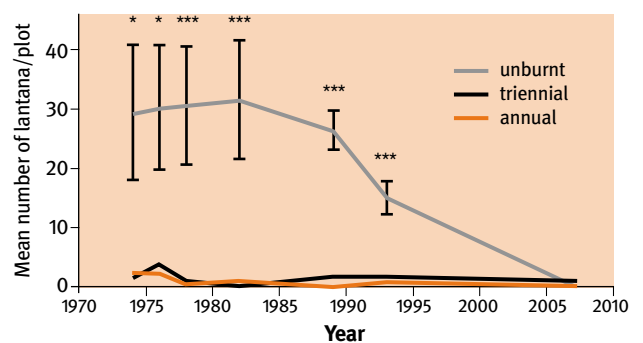


Figure 2. Impact of fire on lantana post-logging in 100 m² monitoring plots.

1970s. This change in lantana density has been attributed to variation in annual rainfall and factors such as changes in the initial lantana density and soil nutrients. Some of the unburnt plots were affected by wildfire in 2006 which are likely to have influenced the low numbers of lantana in the unburnt treatment in 2007.

When the triennial treatment was commenced in 1973 the lantana population was low because fire had previously been used in managing this area. There was a slight increase in lantana density in the triennial burn treatment initially. However, the long-term trend of burning triennially or annually since 1973 has led to a steady decline of lantana. The trends since 1973 suggest that annual burning confers no advantage over triennial burning in controlling low densities of lantana.

In summary:

- Long-term regular burning significantly reduced lantana density compared with no burning.
- Annual burning was no more effective than triennial burning in controlling low densities of lantana.
- Rainfall variability also correlated with changes in lantana density.
- Repeated burning reduced the year to year variation in lantana dynamics.
- Triennial burning is a potential management tool for control of lantana in this forest type. Burning annually in this forest is not recommended since it can lead to reduced soil nutrition, increased soil erosion and poor forest sustainability.



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For more information on other lantana control options see: www.weeds.org.au/WoNS/lantana/ or call DEEDI on 13 25 23



This article has been adapted from a presentation by Tom Lewis and Valerie Debuse, Forestry Scientists, Horticulture and Forestry Science, DEEDI.

No gates needed!

In Argentina much of the cropping land is run in conjunction with cattle in a five year rotation. Pastures and lucerne are grown and grazed for three years and then there are two years of crop before a return to grazing. This is a very sustainable system with a minimum of inputs.

To keep this system simple, fencing in the cropping rotation areas is generally a single electric wire one metre from ground level. Stock movement between paddocks is carried out by lifting the wire high enough for animals to move under it.

There are no gates. Farm vehicles are set up to drive over the wires and this saves considerable time because the paddocks can be accessed from anywhere around the perimeter. Rods are installed under farm vehicles, running from front to back. These rods stop the single wire from getting caught under the vehicle. Temporary pipes are placed on the front of the rods to guide the wire under the vehicle as the fence is approached.

This type of fencing is very low cost and it allows for excellent grazing management.

Blue and purple flowered weeds

These five blue or purple flowered weeds are often confused. They vary in importance in their effect on pastures. Creeping lantana is the most damaging of these weeds.

Blue heliotrope *Heliotropium amplexicaule*

Description: An introduced perennial herb, native to South America. Grows to 30 cm tall. Usually prostrate with alternate leaves that are soft to touch and a dull green. Veins are prominent on the underside of leaves. Flowers are purple or lilac and flowering occurs in spring and summer. Flowers attach to one side of the main stalk which curls at the end. Plants have a large spreading root system.

Habitat: Blue heliotrope can carpet large areas of cultivation or grazing paddocks. This species can colonise a wide variety of soils but is most common on lighter sandy soils.

Notes: Blue heliotrope is a widespread weed that is difficult to control. In overgrazed or drought situations it can dominate pastures. Blue heliotrope in fertilised pastures has been shown to be either more palatable or more toxic to animals, resulting in stock losses. However on many other properties stock eat blue heliotrope and are apparently unaffected.

A beetle has been introduced to control this plant. The beetle has been very successful in reducing blue heliotrope dominance in pasture under good seasonal conditions with large numbers of beetles.

Mayne's pest *Verbena tenuisecta*

Description: Prostrate, hairy and branched perennial herb, native to South America. Aromatic. Grows to 30 cm tall. Leaves are opposite on the stem, fine and fern like. Stems are square in cross-section. Flowers are light purple to pink; there is a less common white-flowered form.

Habitat: This plant is common along roadsides and has the ability to take over native pastures in heavily grazed areas. It seems to prefer lighter soils.

Notes: Cattle eat Mayne's pest, which has protein levels up to 16%. It has been suspected of causing poisoning in stock, but there is little definite evidence to support this.

Veined verbena, purple top

Verbena bonariensis

Description: Stout erect perennial forb, native to South America. Grows to 1 to 2 m high. Stems are square shaped, very rigid and rough to touch. Leaves are opposite with coarse, saw-toothed leaf edges and feel like sandpaper to touch. Flowers are dark bluish

to purple at the end of the stems.

Habitat: Veined verbena often grows in disturbed areas. It will grow on a wide variety of soils but tends to prefer lighter soils.

Notes: The plant has the ability to form dense stands amongst pasture and at headlands of cultivation. In comparison to the other species detailed in this note, it causes fewer problems and is less invasive.

Creeping lantana *Lantana montevidensis*

Description: A perennial shrub introduced from South America as a garden ornamental. Stems are four cornered when young and become rounded when older. Stems are weak and the plant has a sprawling habit. Flowers are mauve to purple. Fruits are brown and succulent. Leaves have a strong aromatic odour when crushed.

Habitat: Creeping lantana grows well in shallow stony soils and often on inaccessible hillsides and gullies.

Notes: This is an aggressive invader of pastures. In times of drought the plant can suppress the growth of pastures, taking over large areas. It is an increasing problem in Queensland and should be kept out of pastures if possible. Creeping lantana has been suspected of causing poisoning in stock.

Paterson's curse, salvation Jane

Echium plantagineum

Description: Erect annual, sometimes biannual, introduced from the Mediterranean region. Usually to 75 cm tall but can grow to 1.2 m. Usually has several bristle-covered stems. Leaves form a rosette around the main stem and central taproot. Smaller leaves are found on the stems. Older flowers are usually purple but new flower buds can be pink. In isolated cases the full flower can be pink or white.

Habitat: Paterson's curse grows on a variety of soils and particularly in disturbed areas.

Notes: Paterson's curse is not common in Queensland but has the potential to become a serious weed. Many outbreaks of the weed have occurred in southern Queensland when oats contaminated with Paterson's curse seed have been planted for winter stockfeed. The plant is a good source of nectar for honeybees but this is its only favourable attribute. Crown boring and root boring insects for biological control of the plant have been released in southern states. This plant can also cause severe hay fever in some people. The plant is known to be poisonous to sheep where they have had long term access to the plant.



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Cost of production

You may hear people refer to the benchmark 'cost of production' (CoP) quoted as dollars per kilogram of beef produced. This is calculated by adding up the operating costs (excluding interest, tax and development) in producing beef for the year and dividing this by the total kilograms of beef produced for the year (not just sales but including change in cattle numbers and weights).

The most profitable beef businesses usually have a CoP under one dollar per kilogram of live weight. If, however, you calculate that your production cost is \$1.80 per kilogram liveweight and your average sale price is \$1.50/kg liveweight, then you know there is a problem.

Producers generally have more control over their costs than over sale prices. To improve the overall cost of production means either cutting costs in areas that are not contributing well to beef production and/or increasing investments in areas which give greater productivity returns.

For example, say you spend \$5 to produce 5 kg of liveweight. CoP is calculated as $5/5 = \$1$ cost per 1 kg liveweight gain. To lower your CoP you could either:

- reduce the cost to \$4 and still maintain 5 kg production: $4/5 = 80c/kg$, or
- increase investment to \$6 to produce 7 kg: $6/7 = 86c/kg$.

The two primary factors distinguishing the top 20% of Queensland cattle properties, found during studies in the 1990s conducted by Rural Consulting Services (RCS) and commissioned by The Rural Industries Research and Development Corporation (RIRDC), were

- lower cost of production, and
- higher productivity per unit of rainfall.

In the grazing business the greatest factor influencing production is the amount and quality of feed grown for rainfall received. From the EDGE Grazing Land Management courses we know that land in 'A' condition is twice as productive as land in 'C' condition, so maintaining 'A' land condition is a crucial part of the equation (e.g. spelling during the wet season and retaining stubble coming into summer).

Areas to consider for cutting costs include:

- reducing unnecessary overhead costs, which will be eating away at the business regardless of the number of stock run
- reducing the amount of money tied up in capital items, such as machinery, which are not earning their keep

- taking advantage of economies of scale, perhaps by investing in labour-saving technologies to improve labour efficiency relative to cattle numbers.

When comparing figures across properties, remember that what is possible on one property may not be possible on others due to factors such as scale of operation, land prices, labour inputs, stage of business development, enterprise type, rainfall variation and so on. Many smaller properties with lower scales of operation and higher land prices will find it difficult to achieve low costs of production. The main contribution to profit will be increasing land value.

Want more information?

Cost of production is just one of many useful calculations for analysing the profitability of a business. To be able to gain benefit from calculations such as these, you must have good records and use these records to analyse your business and determine what is or isn't contributing to profit.

A free CoP calculator and fact note can be downloaded from the Meat & Livestock Australia website (www.mla.com.au). Various training options are available from a number of providers:

- RCS deliver a service called Profit Probe which involves very detailed benchmarking of your business to analyse past performance.
- MLA is currently developing a two day EDGE business workshop.
- DEEDI offers a one day workshop called 'Testing Management Options' which is an easy stepping stone into whole farm economics and enterprise comparisons.
- There is also a two day workshop using software called Breedcow & Dynama which also does options analysis.

The FarmReady website (www.farmready.gov.au) lists many other training options for which a training subsidy is available.

Reference: Grazing benchmarks and management in eastern Australia (RIRDC) <https://rirdc.infoservices.com.au/downloads/01-035.pdf>



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Don't rely on a good wet to get you out of trouble

It is amazing what rain can do to country after a run of dry years. And it is easy to think that given a good season even the most overgrazed country will recover. But long term research at the MLA-funded *Wambiana* trial near Charters Towers shows that this is not necessarily the case and that the path to recovery can be slow and painful.

The trial started in 1998 and is comparing the effects of different grazing strategies on a range of factors including animal production and land condition. Strategies being tested are variable stocking (VAR) with cattle numbers adjusted to available pasture, rotational wet season spelling (R/Spell), heavy stocking (HSR) and moderate stocking (MSR).

As is common in north Queensland, rainfall over the last 11 years has been extremely variable: while the early years were wet, the period from 2001 to 2005 was very dry. Since then rainfall has improved, with the 2007/08 season being particularly good and receiving 1028 mm of relatively well distributed rainfall.

One key pasture variable being measured is the density of 3P grasses which gives a simple but reliable indicator of both land health and productivity. 3P species are the palatable, productive, perennial grasses and include desert bluegrass, Queensland bluegrass, Mitchell grass and black spear grass.

After a run of dry years, measurements taken in 2006 (figure 1) showed that there were big differences in 3P density between strategies: overall, the density of 3P grasses was far greater in the MSR, VAR and R/Spell strategies than in the HSR. In particular, 3P density in the MSR was 4 to 5 times that in the HSR.

This is because heavy grazing prior to and during drought lead to the death of many 3P tussocks, reducing their density in the HSR. In contrast, the lighter grazing pressure in the other treatments, particularly in the dry years (as well as the wet season spelling in the R/Spell), allowed a large proportion of 3P tussocks to survive, even under very low rainfall.

In some ways, this was all to be expected. However, the real story has been the change in tussock density with the better seasons from 2006 to 2008.

Overall, 3P density increased in the MSR, VAR and R/Spell over the last two years. In complete contrast, no recovery has occurred in the HSR, with tussock densities actually declining since 2006.

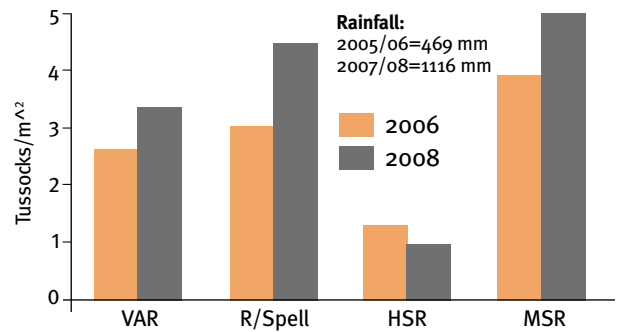


Figure 1: The density of 3P tussocks under different grazing strategies in 2006 and 2008.

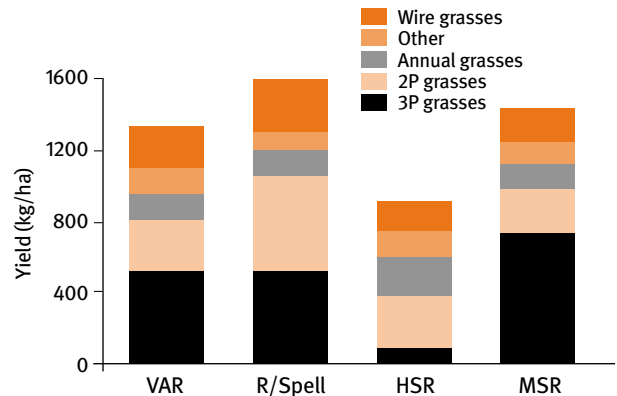


Figure 2: Pasture yield and composition after 11 years under different grazing strategies.

This is despite the better seasons and the fact that stocking rates were reduced in the HSR by about one third in May 2005 due to a drop in carrying capacity.

From a production point of view, these observations show that the ability to grow forage in the MSR, VAR and R/Spell is many times greater than in the HSR. This is graphically illustrated (figure 2) by the paddock yields and pasture composition recorded at the end of the wet in May 2008: not only is total yield far lower in the HSR, but the proportion of yield made up by 3P grasses is far smaller than in the other strategies.

So the bottom line is this: if you want to grow lots of feed for your stock, look after your better grasses by stocking moderately, adjusting stock numbers with the seasons, and employing some form of wet season spelling regime.

If you get it seriously wrong, things will not recover overnight simply because you get a few good seasons or even reduce stocking rates. If pasture condition declines too far, both your land and bank account could be in trouble.

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Good rainfall or not, it doesn't pay to overstock

In December 1997 we started a long term grazing trial on the Lyons family property *Wambiana* near Charters Towers, comparing the profitability and sustainability of different stocking strategies. In this article we present some results from the heavy stocking rate (HSR) treatment (4 ha/animal equivalent (AE)) and the moderate stocking rate (MSR, 8 ha/AE). Results from the rotational wet season spell and variable stocking strategies are presented in another article in this issue of *BeefTalk*.

The first 10 years of trial results showed that heavy stocking led to pasture degradation and was unprofitable in the longer term. The stocking rate in the HSR also had to be reduced by about 30% in 2005 due to reduced carrying capacity. Moderate stocking, in contrast, was sustainable, maintained pasture condition, and ensured long-term profitability.

However these results were calculated over the period 1998 to 2007 which included six consecutive below-average rainfall years. With the good rainfall in recent seasons do these conclusions still apply?

The very good rains in 2007/08 and 2008/09 allowed pasture cover and productivity to rebound significantly in the HSR. Animal performance was also very good and individual animal production in the HSR was higher than the MSR for the first time in 12 years. This occurred because of the extended wet season and short, high quality pasture in the HSR. Gross margins also recovered strongly in these wet years and in 2007/08 the gross margin in the HSR was the highest of all treatments. This is a dramatic change given that the HSR had run at a net loss for the previous six years.

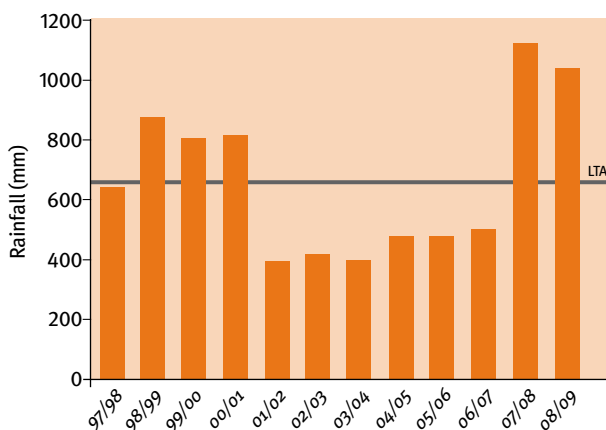


Figure 1. Annual rainfall between 1997/98 and 2008/09 at the Wambiana grazing trial and long term average rainfall (LTA)

This recovery is impressive, but does not alter the conclusions reached previously. First, after 12 years the HSR is still \$9000 to \$10 000 per 100 ha in accumulated cash surplus behind the MSR. Assuming a property size of 20 000 ha, this equates to an advantage of more than \$1 million in favour of the MSR relative to heavy stocking.

Second, the density of 3P (palatable, perennial and productive) grasses in the MSR is still 3 to 4 times greater than in the HSR. This suggests that the increased production and profitability in the HSR results from the flush of short, annual pastures during the recent good seasons and will not continue in the longer term.

After 12 years of conditions that ranged from drought to some very good seasons, it is apparent that:

1. Moderate stocking is sustainable, profitable and maintains pasture condition.
2. Heavy stocking is generally not profitable, is unsustainable and leads to pasture degradation.

Results from the other treatments in the trial will be presented in more detail at a later date, but both the variable and rotational spell strategies performed substantially better than the HSR.

The *Wambiana* trial will be continued with ongoing MLA funding. In this new phase, the heavy and moderate stocking treatments will remain unchanged but some modification to the variable stocking and spelling treatments will occur.

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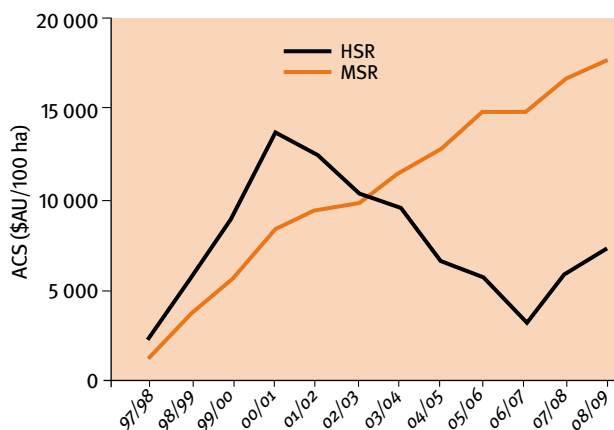


Figure 2. Accumulated cash surplus (ACS) at the Wambiana trial from 1997/98 to 2008/09.

Hormone growth promotants (HGPs) – a new MLA publication

Meat and Livestock Australia is currently producing a booklet titled 'Using hormone growth promotants to increase beef production'. The publication has been prepared in response to requests from the Regional Beef Research Committees for clear and unbiased information on best practice use of hormonal growth promotants.

Topics include the hormones and implants, deciding about whether to use them, implanting strategies, buying and implanting HGPs, effects on cattle and humans, economics and case studies.

The publication should be available within the next few months from Meat and Livestock Australia (www.mla.com.au or 1800 023 100).

To get best results from using HGPs, it is important to use low stress, best practice application procedures. If in doubt, consult relevant HGP representatives.

Key messages about the use of HGPs

extracted from 'Using hormone growth promotants to increase beef production'

- HGPs can provide significant economic benefits in both grassfed and feedlotted cattle.
- Daily weight gain can be increased by 10–30%, feed conversion efficiency by 5–15% and carcass leanness by 5–8%. This can represent an economic benefit of \$30–50 for the small cost of implanting the HGP.
- Cattle need good feed to respond well to HGPs.
- Cattle cannot respond when they are only

maintaining weight or losing it, but will not lose extra weight because of the HGP.

- Once an HGP implant program has started, it should be continued through until slaughter for the best growth response.
- More frequent treatment with a repeat or new implant will give a greater overall response in liveweight gain.
- Long payout HGPs are most suitable when cattle cannot be easily yarded for re-implantation.
- Growth can be promoted continuously through repeated implants with oestrogenic hormones or by alternating an oestrogen implant with a combination implant of oestrogen plus androgen.
- Implanting with an oestrogen, even repeatedly, does not affect carcass composition per se. Cattle attain mature carcass composition at higher liveweights so they may be leaner with less marbling at intermediate weights.
- Repeated implanting with an androgen will reduce carcass fatness and marbling, and result in downgrading of carcasses at slaughter.
- Repeated implantation, especially with a combination implant, will result in a reduction in eating quality.
- HGP-treated cattle are eligible for MSA grading but will be penalised to reflect the reduction in meat eating quality.
- The European Union market will not take HGP-treated animals.
- Residual hormone levels in meat from animals implanted with HGPs are manyfold times lower than levels of natural hormones found in common Western food.
- Meat from animals implanted with HGPs is safe for human consumption.

Using electronic NLIS tags for management

The opportunity

Since the National Livestock Identification System (NLIS) for traceability was introduced in July 2005, cattle are required to have an electronic identification tag (or bolus) before moving off the property of origin. These tags represent a great opportunity for efficient electronic herd data recording.

Accurate, objective records are essential for measuring animal performance and improving

business management. Efficient data collection can also reduce handling, labour, time and risk in the yards.

How easy and economical is it to use NLIS tags for recording information? To gain insights into how this is being done on properties throughout Queensland, the Department of Employment, Economic Development and Innovation (DEEDI) has recently run a series of producer demonstrations with MLA funding support.

Capturing data at the weigh scales

A common approach to automating data capture is to read the animals' electronic tags by wand or panel reader while the animals are in the weigh scales.

The tag number and animal's weight are recorded automatically into a smart weigh scale indicator. 'Smart' means the indicator can store and process livestock data, for example, to show average daily weight gain, and this data can be sorted on a scale from heaviest to lightest. Data such as health treatments, breed or vendor can also be recorded. Having this information on hand allows the producer to make crush-side decisions instead of having to go away to analyse data and return to reprocess stock. The scales can also generate drafting instructions to indicate which way to draft stock according to weight. The scales can be loaded with software for transferring tag data onto the NLIS database.

A smart scale indicator can meet many recording needs, particularly for backgrounding and trading operations. Breeding operations can use additional herd recording software in conjunction with the smart scales to record specific breeder herd data.

Using the data

Producers are using this data to:

- sort cattle into weight groups
- identify and cull poor performers
- use automatic drafting up to five ways
- monitor performance according to breed and vendor
- match stock to market specifications
- ensure correct treatment rates
- maintain auditable health records
- link live animal data to carcase feedback data
- forward livestock data to buyers to show stock on offer.

Producers are also deriving valuable benefits by using cattle liveweights to measure paddock performance capabilities according to class of animal. With realistic seasonal and annual liveweight gain data that has been derived from records for different paddocks, pastures, crops and classes of animals, producers are far better positioned to evaluate their enterprise and marketing options and forward budget the economics of management decisions.

Greater benefits for larger operators

It became clear that the larger the scale of operation, the greater the benefits from automating individual data capture. The set up costs are spread across more animals and the time saving and accuracy

benefits are amplified. Feedlotters, backgrounders and traders are well positioned to capitalise because cattle arrive at their premises with NLIS tags in place. Moderate to large breeding operations will also benefit, although the chance of tag losses – and consequently data losses – increase as breeders age. Understandably people running small numbers tend to balk at the expense of installing a tag reader as the benefits may not outweigh the costs.

Small operators benefit too

It is still possible to gain some management benefits from NLIS tags (and even supply the European market) without owning an NLIS tag reader or smart scales. To do this producers use numbered management tags with the number linked to (and possibly the same as) the last 5 digits on the NLIS tag. When they receive carcase feedback from the abattoir they are able to look up the NLIS database to match the electronic number with the NLIS number (on the outside of the tag) and their management tag.

To gain the benefit of the data on the electronic tag, smaller operators could consider options for minimising costs such as hiring or jointly purchasing a wand.

Getting a system to work

If you are thinking of establishing an electronic data-recording system, plan your approach carefully so that you can minimise the frustrations that can arise while setting up the system and getting it to work smoothly for you.

Talk to other producers who are already using the technology. Compare commercial suppliers' services and consider obtaining professional advice. Clarify your needs for performance and Quality Assurance data and check that the system will meet these.

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Pasture development options

Sown pastures are a useful tool for lifting carrying capacity, increasing animal growth rates and improving land condition.

The term sown or improved pasture means different things to different people. The following are all types of pasture development:

- high input pasture development
- low input pasture development
- special purpose pastures
- dryland forage crops.

The choice will depend on land, financial, labour and infrastructure constraints and the management demands of the production system.

High input development

High input pasture development involves replacing the existing native or sown grass pasture with productive exotic grasses and legumes. Traditionally this has also meant clearing native or regrowth vegetation. However with the constraints imposed by Vegetation Management Legislation in recent years, the focus for high input development has changed to areas of poor land condition or ex-cultivation country.

The replacement pasture is sown into a fully prepared seedbed. Generally this involves several passes with a plough, off-set discs or a tined implement to remove all vegetation, conserve sub-soil moisture and ensure a fine and even soil surface texture to optimise germination and establishment. Depending on the inherent fertility of the country and the production expectations for the pasture, fertiliser is often applied prior to sowing. Poorer coastal soils often require a pre-planting application of 125 to 250 kg/ha superphosphate or a planting application of 50 kg/ha DAP.

To maintain pasture productivity and slow run-down, maintenance applications of superphosphate might be required in the range of 50 to 125 kg/ha/year, depending on soil type. It is common to topdress with superphosphate every 2 to 3 years.

It is important to include a range of legumes in the pasture mix. Legumes will help slow pasture run-down and maintain animal growth rates.

Completely replacing a pasture is usually only cost effective when the existing pasture is degraded or when the planned sown pasture has a specific production purpose (e.g. finishing sale cattle or

weaning). The cost to benefit ratio needs to be carefully considered when planning high input pasture development.

Advantages

- productive pasture systems with improved carrying capacity
- extended growing season with increased animal weight gains
- control of woody, herbaceous and grass weeds

Disadvantages

- high cost (cultivation, fertiliser, seed)
- need for agricultural equipment or access to contractors
- risk of failed establishment
- ongoing maintenance costs.

Low input development

Oversowing legumes into either a native pasture or a rundown sown pasture is considered to be low input development. The inclusion of a legume in the pasture sward can lift annual liveweight gains of beef cattle by 30 to 50 kg/hd. Suitable legumes include fine stem stylo, Seca stylo and Wynn cassia.

The benefit of low input establishment of legumes is gained from improved animal growth rates rather than from increased carrying capacity. In fact, the temptation to increase stocking rate should be avoided because this will often result in the grass component of the sward declining leading to legume dominance.

Successful establishment requires some disturbance to create a minimal seedbed and to temporarily check the existing grass. Low sowing rates (0.2 to 1 kg/ha) are often used to reduce costs. Low-cost sowing techniques such as strip planting, band seeding, aerial broadcasting and small 'seed plots' are often used. Spreading seed during a stick raking operation is also often used to establish legume.

In the past, the use of Superphosphate at 50 kg/ha/year was used to improve the nutritive value and growth of the sown and naturalised legumes. This is unlikely to be economically viable these days given the high cost of fertiliser.

Advantages

- low cost means larger areas can be oversown
- cattle can be encouraged to graze larger paddocks more evenly
- no need for expensive plant and equipment

Disadvantages

- slow build up of legumes from low seed rates
- no long term control of timber regrowth

- progressive decline of palatable grasses if stocking rates are increased, leading to legume dominance.

Special purpose pastures

Special purpose pastures can be grown on small areas of suitable soils to provide high quality feed in seasons when other feed quality is low. Examples include legume-based pastures (leucaena and Maku lotus), nitrogen-fertilised sown pastures, and irrigated pastures.

Leucaena is a browse shrub that provides high-quality feed on deep fertile soils. It can be spelled during summer to provide excellent autumn feed. Lotus will provide quality feed on wet coastal flats during winter/spring.

Callide Rhodes and pangola are examples of grasses that respond well to the application of nitrogenous fertiliser. They provide high quality feed during the late summer and autumn period for special purposes such as finishing stock for market.

Irrigated annual and/or perennial pastures are high cost pastures that are capable of high production. They can be used to finish or grow cattle during the winter period when production from other types of pasture is usually poor.

Advantages

- quality feed in critical seasons
- increased production system and cattle turn-off options

Disadvantages

- usually only small areas available
- require infrastructure development such as water and fencing
- greater level of management expertise required
- marginal economic returns from nitrogen-fertilised or irrigated beef pastures.

Dry-land forage crops

Forage crops are sown into a fully prepared seedbed with good sub-soil moisture. Winter forages include oats, ryegrass and triticale. Summer fallow to store sub-soil moisture, autumn sowing rain, and some in-crop winter rain are needed for successful winter forage crop production.

Summer forages include forage sorghums, millets and forage legumes. These can be sown with minimal moisture but rely on in-crop rain. Sorghums are generally lower in quality than millets but produce more bulk; forage legumes are slower growing than the grass fodder crops.

Forage crops can be used as a pre-crop for pasture establishment. The combination of cultivation,

pre-emergent herbicides and heavy stocking rates ensure adequate weed control for the subsequent sown pasture.

Advantages

- high carrying capacity
- ability to utilise year round feed plans
- good cattle growth rates on winter cereals
- weed control prior to pasture establishment
- summer forages allow native pastures to be spelled during the growing season

Disadvantages

- recurring cost of cultivation, seed and fertiliser
- winter forages often require irrigation
- non-irrigated winter forage crops are subject to significant seasonal variation depending on rainfall
- need for farming plant or reliable access to contractors.

Irrespective of which development option you use, sound pasture management is critical for sustained optimal pasture productivity. Managing native or sown pastures involves developing and maintaining adequate infrastructure such as fencing and water; setting, monitoring and adjusting stocking rates; controlling weeds; and using pasture management 'tools' such as strategic fire, spelling and fertiliser application (refer to *BeefTalk* articles in editions 4, 7, 11, 12, 15, 17, 18, 22 and 24).

As discussed in *BeefTalk* 12, the benefits of sown pastures need to be weighed against their limitations and risks.

This article has been adapted from a DPI note written by Jim Wright, a former DPI agronomist.

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Timely tips for south-east Queensland

Spring
September, October, November

BREEDING

Breeders Assess breeder condition for mating. First calf cows may need extra care.

Vaccinate maiden heifers for vibriosis (2 vaccinations 4 to 6 weeks apart).

Vaccinate maiden heifers for leptospirosis if a problem has been diagnosed (2 vaccinations 4 weeks apart).

Check calving cows, especially heifers, regularly.

If possible keep calving cows, especially heifers, in paddocks that are readily accessible and fairly close to a set of yards.

Make up a calving kit (calf pulling gear, chains, buckets, clean

water, antiseptic, gloves, boots and overalls). Have all calving gear clean and ready to go.

If you have to assist a cow giving birth, make sure you wear appropriate safety gear (long gloves etc). Brucellosis, leptospirosis (from infected urine), 'Q' Fever etc are very serious diseases in humans.

Know or have on display the telephone number of your local vet.

Record all cows and heifers that have calving problems and sell them and their calves as soon as practical.

Order NLIS ear tags or rumen boluses for calves branded this year.

Bulls Evaluate information available on potential bull supplies.

Purchase bulls according to guidelines. Remember, you get paid for number of calves (fertility) and by weight (weight gain).

Check purchased bulls are in working condition, not fat sale condition.

Conduct breeding soundness evaluation test on all bulls (checking for both physical and reproductive soundness).

Check all bulls for:

- injuries, stiffness of gait, cuts or swelling.
- signs of three-day sickness.

Cull bulls on age (over 6–7 years).

Cull any bulls with defects.

Vaccinate bulls for three-day sickness (BEF) and vibriosis (2 doses 1 month apart initially, then annual booster).

Check mating paddocks are secure.

Put bulls out with breeders:

- Mate heifers one month before the main herd where nutrition is adequate.
- Mate young bulls with young cows.
- Avoid mixing differently aged bulls if possible.

Check purchased bulls are in working condition, not fat sale condition.

Check all bulls for soundness (physical and reproductive) as well as for injuries, stiffness of gait, cuts or swelling. Cull any bulls with permanent defects.

Obtain bull breeding soundness evaluation tests for all bulls to be used.

Cull bulls on age (over 6–7 years).

Vaccinate bulls for three-day sickness (BEF) and vibriosis (2 doses 1 month apart initially, then annual booster) and pestivirus.

Check mating paddocks are secure.

Avoid mixing bulls of different ages if possible.

Growing cattle (steers and cull heifers)

Consider vaccination against three-day sickness (BEF), particularly forward stock close to turnoff.

Summer
December, January, February

BREEDING

Breeders **Mate heifers with young bulls earlier than rest of herd.**

Heifers should be well grown and in strong condition.

Don't let maiden heifers get too fat.

Calves

Brand, dehorn, castrate, tag and vaccinate (5-in-1 or 7-in-1).

Enter new calves onto herd performance recording program.

Enter new calves into NLIS data base.

Bulls **Observe bulls in mating paddocks. Are they all working?**

When mating multiple bulls with a group of cows, try to use bulls that are the same age and weight to avoid dominant behaviour by bigger older bulls.

Growing cattle (steers and cull heifers)

Weigh; assess individually rather than on average.

Assess performance against required target.

Check whether poor calves come from one bull. If so, cull bull and calves.

Consider HGP implants for steer calves for non-EU sale.

Evaluate markets and plan sales. Do you have to book cattle into meatworks or feedlots?

NUTRITION

Start phosphorus supplementation program in deficient areas. Continue until end of the growing season.

If season has been good, consider stockpiling 'cheap' good quality hay.



Timely tips for south-east Queensland

NUTRITION

Review dry season management plan and climate forecasts.

Reassess pasture quantity and quality in relation to ground cover and feed values at the end of the dry season.

Feed energy and protein supplements to breeders that are heavily pregnant or lactating and to weaners to maintain liveweight.

Evaluate effectiveness and cost benefit of winter supplementation program.

Re-order molasses, grain supplies or supplements for next dry season.

PASTURES

Check pastures at the spring break:

- Is there enough ground cover?
- Consider spelling pastures early in the growing season for a positive impact on pasture composition. Prolonged heavy grazing of fresh growth will have a serious detrimental effect on the desirable species of grasses.

- Consider burning native pastures to maintain good pasture condition and control woody weed growth.

Check and control weeds before they seed. Actively patrol known 'hot spots'. Check areas used for supplementary feeding.

Watch long-range weather forecasts for suitable time to plant pasture.

Check firebreaks and fire-fighting equipment.

If pasture development is a part of your overall plan, sow pastures if seasonal conditions are favourable. If you can't get the pasture in by the beginning of October it is best to wait until the New Year. This reduces the risk of failed establishment due to heatwave and drought conditions or, in a very good year, flood conditions.

PARASITES & DISEASES

Vaccinate bulls for vibriosis.

Vaccinate for three-day sickness.

Vaccinate all breeding cattle, including bulls, for pestivirus.

Obtain cattle dip analysis and adjust chemical level if necessary.

Check early calves (late winter) for ticks.

Start tick control program.

Check weaners for worms (send faecal sample to WormCheck program) one month after season has broken.

BUSINESS

Meet with all staff to discuss progress of the business and to plan for the future, including retirement and succession planning.

Review overall property management and any changes that may be necessary.

Review breeding program; assess whether it is producing animals suitable for market requirements.

PROPERTY MAINTENANCE

Check mating paddocks are secure.

Check river and creek crossings before wet season.

Before end of dry season look for green patches in paddocks that might indicate water leaking from underground piping.

Maintain fire fighting equipment, extinguishers etc and ensure staff are fully trained in their use.

Clean around buildings and check gutters are free of leaves.

Ensure fire breaks are maintained and serviceable.

PASTURES

Evaluate post-dry season pasture management.

Spell leucaena for at least 2 months.

Consider applying maintenance fertiliser to sown pastures.

Lock up paddocks to build up pasture grass seed banks in soil.

Consider growing a summer forage crop to carry cattle while pasture paddocks are being spelled.

Consider setting areas aside for re-forestation.

PARASITES & DISEASES

Continue tick control program.

Check young cattle for worms. Treat if necessary. Send faecal samples for WormCheck 2 weeks after treatment to check for worm drench resistance. Get samples from smallest animals.

Control buffalo fly where applicable with correct sprays, insecticidal ear tags and buffalo fly traps.

Make sure all chemical treatments used are entered into correct files for Traceback.

BUSINESS

Have annual health check.

Have a break with family over Christmas.

Evaluate markets and plan sales for coming year.

Review marketing options.

Update NLIS database regarding all cattle born, purchased, sold or died during the year.

Check all permits and registrations etc are up to date.

PROPERTY MAINTENANCE

While water is in dams and creeks carry out annual maintenance on windmills and watering points.

Carry out workplace health and safety audit across property.

Do annual electrical safety check on all household and farm equipment.

Consider attending Chemical Accreditation Program through AgForce SMART Train.

Carry out vehicle and machinery maintenance during 'wet season' break; especially look after dry-season supplement feed-out trailers etc so they are ready for the next dry.

Clean up shed.

Developing private forestry in Queensland

For many reasons, a healthy and productive forest on your property can add enormous value to the farm enterprise and at the same time can provide recognised environmental services to the broader community.

The benefits of forest cover in our landscape are widely appreciated by rural and urban communities alike: soil rejuvenation, protection from erosion, landscape stability, wildlife habitat, livestock protection, timber production, hydrological stability, sequestration of carbon dioxide, production of oxygen, rural and urban employment and, not to be underestimated, the aesthetic value of a healthy forest.

Many landholders throughout Queensland have integrated forest management into their production systems and are now benefiting from years of healthy forest production.

However forests in the rural landscape require active management. No matter what your purpose for growing or managing forests, the same fundamental management principles are required so that your forest can be healthy and productive.

The forests in this region are well documented as being generally in poor condition from both productivity and environmental perspectives, with grossly overstocked stands having little ground cover and very low growth rates. Much of these forests are also on highly erodible sodic soils and are grazed under multiple farm enterprises.

Re-Vegnet.au project

Re-Vegnet.au is a consortium of groups brought together to address the condition, productivity and extent of the private forest resource along the Queensland east coast, particularly within the

catchments of the Great Barrier Reef, Great Sandy Straits and Moreton Bay. The consortium is drawn from Private Forestry Southern Queensland, SEQ Catchments, Central Queensland Forest Association and Terrain NRM Group, with a close working relationship with DEEDIs Grazing Land Management Unit, and was funded in October 2009 by the Australian Government under the 'Caring for our Country Program' for a four year period.

The project is considering the full scope of private forestry practice through defining best management forest practice, mapping and risk-assessing priority areas, improving the skills and management capacity of landholders and developing property management plans that mitigate the risks to implementing those plans via an incentive program for on-ground works.

In the first eight months of the project, 466 landholders attended field days and seminars on native forest management, fire management, plantation development or harvesting and product identification. Sixty-nine landholders have completed Forest Management Plans and are receiving incentive payments to assist them in thinning 5200 ha of forest to improve its health, productivity and ground cover. The project has a target of completing 5250 ha of forest treatment each year for the next three years.

The project has developed a system for rapidly assessing forest condition. It is an A–D system similar to the DEEDIs GLM Land Condition and is a direct reflection of the health and productivity of a forest. Under this system a Forest in A condition in a 900 mm rainfall area may be able to produce 1 m³/ha/yr; a forest in the same area in D condition will have a productivity rating as low as 0.1 m³/ha/yr.

Re-Vegnet.au participation

To participate in the Re-Vegnet.au program first complete the online four-page Forest Management survey at www.pfsq.net



Field Day participants

By completing this survey, you are helping us to design an extension and education program relevant to the needs of landholders in your region, obtain more accurate information on native forest and plantation under management, and determine the type of assistance required to maximise management of your forest resource.

The information you provide in the survey is strictly confidential. Your personal details will be used to assess your eligibility for the incentive program, contact you regarding upcoming events, and assist you with property management planning should you continue with the program.

More than 100 landholders have completed the survey to date.

Demonstration sites

One of the keystones of the project is the development of nine demonstration sites throughout the project regions. Demonstration sites will be developed in conjunction with participating landholders who will be given the opportunity to develop their forest management skills. By supporting and promoting a network of 'champion' landholders the Project will provide a working example of best practice forest management to surrounding landholders and the broader communities.

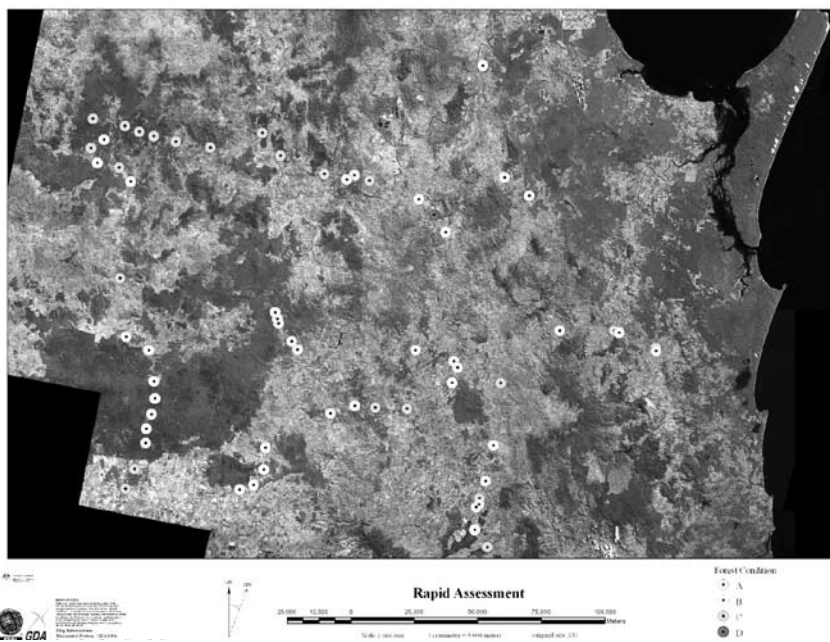
Three demonstration sites have been established so far, at Atherton, Bororen and Gympie. Within each site permanent growth measurement plots and ground cover transects have been set up to gather growth data over time. This data will be critical in demonstrating how a managed forest has a much higher degree of health and productivity than an unmanaged forest. The new sites are in addition to nine existing sites.

Cooperative projects

The project has also been assisting the Silver Lining Foundation Indigenous Corporation in bringing their 100 000 native seedling nursery up to operational standard and also in training a crew in the skills of regrowth forest thinning. The crew is now working on their own property near Wondai to get up to commercial speed and will commence contracting in the next month or so. This crew is in addition to the Corporation's very successful fencing gang which has been contract fencing for the last four years.

Workshops and assistance

The Re-Vegnet.au project is funded to run for the next three years and will continue to run field days on managing regrowth, optimising growth rates, managing with fire, managing grazing land in a forest environment, harvesting sustainably, recognising product products, and maximising



Rapid Assessment results on sites in the Burnett Region

returns, with the aim of encouraging and supporting landholders in managing their forests.

An incentive-based program is available to assist landholders in completing Forest Management Plans for their properties and in implementing those plans.

Further information:

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Private Forestry Southern Queensland Inc
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DEEDI offers a range of workshops covering animal nutrition, sustainable grazing, reproduction and genetics, and business management across the state. These workshops have been developed in collaboration with producers to provide practical information, tools and skills to apply on-farm. They consider the whole business and are tailored to meet specific group and regional issues.

Workshops we deliver include:

- Nutrition EDGE (3 day)
- Grazing Land Management (3 day)
- Stocktake: balancing supply and demand (1 day)
- Artificial Insemination (3 day)
- Breeding EDGE (3 day)
- Breeding for Profit (1 day)
- Bull selection (1 day)
- Pregnancy diagnosis (3 day)
- Better decisions in the business of beef (1 day)
- Testing management options. (1 day)

More information

If you would like more information or to register your interest in attending a workshop please contact your local FutureBeef officer, email the Beef team at beef@deedi.qld.gov.au, phone us on 13 25 23 or visit our web site at www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/27_7783_ENA_HTML.htm

PLS – a useful measure of seed quality and value

An important consideration in sowing pastures is the quality of the pasture seed. Compared with the costs of land preparation, the seed cost is relatively small. However, the quality of that seed can have a big impact on how successfully pastures establish.

The quality of pasture seed lines can be variable. A useful measure for comparing the value of pasture seed lines is PLS, which is the percentage (by weight) of pure live seed. PLS is calculated by multiplying the purity percentage by the germination percentage. Following on from this, you can use the PLS to determine the real cost of the pure live seed in each seed line and also how much seed you need to sow to achieve your desired coverage rate.

As an example, say you wish to establish a Callide Rhodes grass pasture and you have the choice of two lines of seed, one costing \$9/kg, the other \$12/kg. Which is the best value and how much should you sow?

Seed lot	Seed cost per kg as is	Purity	Germination	PLS	Real cost per kg of pure live seed
1	\$9	80%	20%	16%	\$56.25
2	\$12	90%	40%	36%	\$33.33

Firstly you need to read the seed analysis reports for the two lots. The ‘truth in labelling’ regulations require the vendor to provide the purchaser with both the purity ratio and germination rate of the seed lot (both expressed as percentages, and usually provided on the label attached to the bag of seed).

In the example below it is apparent that the ‘cheaper’ seed is really the more expensive because the quality is less than half that of the ‘dearer’ seed.

You also use the PLS to determine the actual sowing rate. As a general rule of thumb, you need to sow grasses at a rate of 1 kg of pure live seed per hectare for successful establishment. To achieve 1 kg pure live seed per hectare, Seed Lot 1 would need to be sown at 6.25 kg/ha, whereas Seed Lot 2 would only need to be sown at 2.8 kg/ha.

This article has been adapted from an earlier article in *BeefTalk* 18.

Further information:

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Sowing pastures



The basic guidelines for sowing pastures are

- the better the seedbed, the better the establishment
- sow all grass and legume seeds on the surface
- sow early in the season (spring) or after December
- apply adequate fertiliser before planting.

Few legumes and even fewer grasses will establish when oversown on undisturbed soils, especially those with hard-setting surfaces. Some soil disturbance is required when sowing pasture. Even low input establishment of legumes requires at least one pass with a chisel plough or offsets or a stick raking that disturbs the soil surface.

Full cultivation reduces the competition for water, light and nutrients from the existing sward and can

release nutrients (particularly nitrogen) that have become mineralised and unavailable to pasture plants. Forage cropping and/or a short fallow prior to pasture establishment can help with weed control.

Sowing the pasture

Sow the ‘best bet’ pasture mix for your particular land type (refer to *BeefTalk* 1, 4 and 26 or consult your local pasture agronomist).

Many pasture seeds are very small (Lotononis has 3.3 million seeds/kg and Rhodes 4 million) and must be surface sown. They will not emerge if sown deeper than a few millimetres below the soil surface.

Spread the seed evenly over the soil surface and preferably use a rubber-tyred roller to ensure soil contact with the seed. Very fine textured (snuffy) soils may need rolling both before and after sowing.

Superphosphate (9% phosphorous, 11% sulphur) is best applied after the major ploughing and harrowed in before sowing. On infertile soils, low

rates of DAP (18% nitrogen, 20% phosphorous) applied before or at sowing will improve pasture establishment.

Sow the seed at the correct rate. Ideally grasses should be sown at 1 kg of pure live seed per hectare (see associated article on determining the percentage of live seed or PLS and calculating coverage rate from this). Do not use a light rate and rely on seed set to thicken the sward in the following season; you will waste potential feed in the first year and allow herbaceous and woody weeds to establish.

Seed can be spread with a rolling drum seeder, specialist small seeds box, fertiliser spinner or combine drill fitted with a seed attachment and the seed hoses removed. Combine drills can not handle fluffy seeds such as Rhodes grass and bluegrass.

Handling fluffy seed

Fertiliser and/or sawdust can be used as a carrier for fluffy pasture seed when a fertiliser spreader is used. However, some points to note are:

- Fertiliser contact will kill the legume seed inoculant unless the legume seeds are pelleted.
- Fertiliser granules throw much further (9 m) than the light grass seed (3 m), so keep the tractor runs close.
- As a guide, mix about 1 bag of a free flowing non-dusty fertiliser, such as DAP, for every hectare of seed.
- Sawdust should be dried and sieved to remove any larger pieces of wood.
- As a guide, mix twice the volume of sawdust with the required amount of seed. Check the sowing rate is correct by filling the fertiliser hopper with enough seed plus carrier mixture for 1 ha and testing whether it covers a 10 000 m² (100 m x 100 m) plot.
- For uniform coverage, use a small spreader opening and keep the tractor runs about 3 m apart; for even better coverage, run passes at 90 degrees to each other.

Using coated seed

Coated seed is an option for handling fluffy grass seed. The seed merchant will often coat fluffy grass seed as a means of cleaning it. The coating is usually lime. Some companies may add some trace nutrients and insecticide to deter ants.

The coating itself can act as a germination inhibitor if it requires significant falls of rain (e.g. more than 25 mm) to soak through the coating and germinate the seed. This is claimed to reduce establishment failures by protecting the seed until sufficient soil moisture is available for germination.

The downside to seed coating is that much of the weight in a bag of coated seed is the coating. There may only be 25% (usually less) seed by weight. Sowing rates need to be adjusted to accommodate this.

Timing sowing

Always aim to sow on a full soil moisture profile.

Sow early or late. Early rain in August/September will go a long way because of the lower temperatures. After December, rainfall and humidity are more reliable. However rain from October to December can be followed by weeks of dry weather and heatwaves which can kill young seedlings.

A light grazing a couple of months after sowing will prevent the early flush of grass growth from smothering the slower growing seedling legumes. It will also encourage stoloniferous grasses to send out runners.

This article has been adapted from a DPI note written by Jim Wright, a former DPI agronomist.

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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)

Grader grass, thatch grass, giant rats tail grass

How do you tell the difference?

Giant rats tail grass (GRT) is certainly the most well known of these grasses and its presence in any paddock is unwelcome. Grader grass is another unpalatable grass but over the years its spread has been much slower in south-east Queensland than originally thought. Thatch grass is often called 'grader grass' because it is mostly seen on the side of the road where a grader may clear and form the table drains. Ten years ago thatch grass was generally seen only in the North Burnett but it is now becoming common throughout the Brisbane Valley. Luckily in most situations it is far more palatable than GRT and grader grass and does not spread so rapidly under grazing.

Grader grass *Themeda quadrivalvis*

This grass is a native of India and Nepal and was

first recorded in Australia in 1935. It is a tussock grass that generally grows to 1 m high in south-east Queensland, although it can grow to 2 m. Grader grass is seen by the roadside and can be recognised by its arching habit when the weight of the seedheads bends the grass stalks over. Being a *Themeda* the seedhead is similar to that of kangaroo grass (*Themeda triandra*). Mature grader grass is not palatable to stock because the stems are coarse and there is little leaf.

Thatch grass or Jaragua grass *Hyparrhenia rufa*

This grass is a native of Africa. As the name suggests it is used to thatch the roofs of huts. It is a very tall and vigorous plant growing to 3 m. The stems are very stout with alternating green and yellow sections along the stem, making the species easy to identify. The green is the stem itself and the yellow is the leaf sheath around the stem. This grass was introduced as a pasture grass and generally seems quite palatable to stock. It is fire resistant and will increase under burning.

Giant rats tail grass *Sporobolus pyramidalis* and *S. natalensis*

This grass from Africa was introduced during the 1960s in pasture seed and has spread rapidly along the eastern coastal fringe. It is a serious threat to the productivity of pastures due to its lack of palatability and fibrous nature.

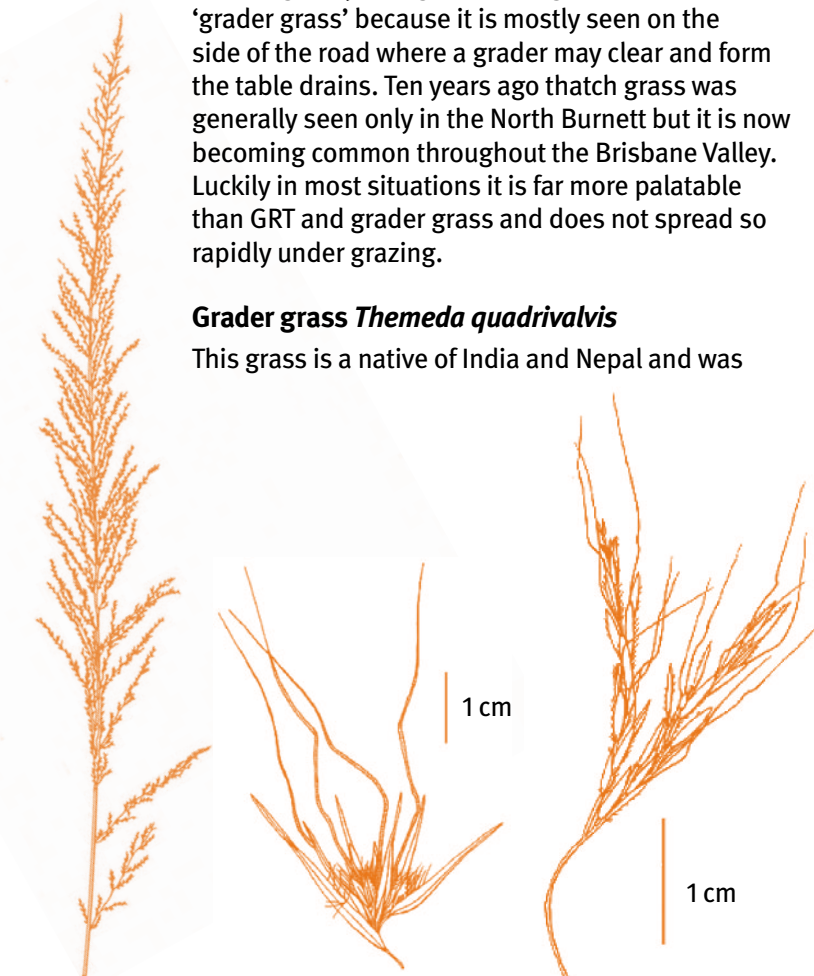
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Sporobolus pyramidalis
and *S. natalensis*

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Themeda quadrivalvis

Line drawing by Will Smith © Queensland Herbarium

Hyparrhenia rufa

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