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Focus on pastures

Update on pasture research

THIS edition of CQ BEEF has a real focus on grazing management, with articles on pasture dieback, grazing management and diet quality.

Rightly so, growth and fertility are driven by nutrition, which is determined by the quantity and quality of available pasture.

Cattle must be able to consume their potential daily pasture intake.

A critical issue for diet quality is how much of the pasture plant we force cattle to eat with leaf having more energy and protein than stem.

Overgrazing results in the most productive grasses being replaced by less desirable species. Lower ground cover then results in less water infiltration and erosion.

If you feel you've managed your grazing pastures well this year and your pastures are ready to respond to rain, give yourself a pat on the back. Given the climate variability we experience here in Central Queensland I think you can call yourself a skilled operator.

If you are worried that you are running your country too



Pasture trial site in Central Queensland evaluating phosphorous fertiliser application.

hard, I recommend a Breed-cow Dynama day with the Department of Agriculture and Fisheries (DAF) team.

Can you remove some drought risk and improve your gross margin per adult

equivalent by running less breeders and holding your growing stock for longer? Can you cover your overhead and financial obligations running less cattle? What would happen if you

improved your weaning rate by giving your breeders more space and more leaf?

If you're interested in testing these scenarios or any others, please let your local beef extension staff mem-

ber know:

- Mick Sullivan, Rockhampton, 4843 2623
- Matt Brown, Rockhampton, 4843 2611
- Byrony Daniels, Emerald, 4991 0867



A critical issue for diet quality is how much of the pasture plant we force cattle to eat with leaf having more energy and protein than stem. Overgrazing results in the most productive grasses being replaced by less desirable species.

Byrony Daniels

- Alice Bambling, Emerald, 4991 0837
 - Jim Fletcher, Mackay, 4967 0731
 - Roxanne Morgan, Mackay, 4967 0731
- If you have further ideas to share please contact Byrony Daniels, beef extension officer, DAF Emerald, 0427 746 434.

Pasture dieback research is a top priority

PASTURE dieback across Queensland is still causing significant losses in pasture and cattle productivity.

The area has expanded over the last 12 months, and estimates suggest at least 200,000 hectares of highly productive pastures are now affected.

Studies undertaken by a

consortium, led and funded by Meat & Livestock Australia (MLA), indicate that mealy bugs are having an impact in pastures affected by dieback.

The interaction and exact role they are playing is still being understood and will be one of the key investigations undertaken over the next couple of years.

Over the last 12 months, the Department of Agriculture and Fisheries has undertaken a range of activities to address the problem.

Nicholas Brazier, our new pasture agronomist, commenced in May.

Nick is based in Rockhampton and will support dieback activities across the

state, along with other sown pasture projects.

"Research trials have been implemented at Brian Pastures Research Station near Gayndah in the central Burnett, and results are available from the first year of measurements," Nick said.

Based on current result, a program of activities has

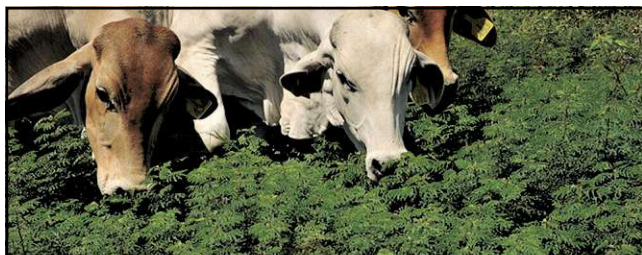
been developed covering:

- industry engagement and extension.
- characterisation and defining the condition.
- diagnosis of cause(s).
- evaluation of management options.

Department staff are committed to supporting the grazing industry with scien-

tific research, developmental support and extension programs aimed at delivering practical solutions.

Further, Department of Agriculture and Fisheries staff are working closely with MLA to develop a collaborative project, and increase the important work being done on dieback.



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Dieback under scrutiny

Pasture dieback trials in progress

THE Department of Agriculture and Fisheries (DAF) has instigated research trials to determine the impact of a range of management options to restore productivity of pastures affected by dieback.

These trials are being conducted at the Brian Pastures Research Station near Gayndah in the central Burnett.

Three studies are underway; pasture comparison trial to investigate the relative tolerance of a range of available grasses and legumes, management option trial in a completely affected (dead) pasture, and management option trial in an affected (not dead) pasture.

All treatments in all trials are replicated and positioned randomly to ensure scientific rigour and confidence with outcomes.

The existing pasture is Bisset creeping bluegrass (*Bothriochloa insculpta*) sown about 20 years ago.

The pasture comparison trial was sown late March 2019 into an area previously fully affected (dead) by dieback, after a six month fallow with cultivation.

Multiple grasses and legumes (19 in total) have been sown and, despite the short time period, the trial is generating valuable insights.



The Brian Pastures Research Station dieback research site at Gayndah, in the Central Burnett, as seen from the air.

Buffel grasses are displaying the most severe dieback symptoms of all the treatments; occurring less than two months after sowing.

Specifically, Gayndah buffel is close to death whereas Biloela buffel has grown better, but is severely yellow and unthrifty.

The bluegrasses of Bisset and Medway (an Indian couch type), and other grasses such as Bambatsi panic, Premier Digit and Strickland finger grass all grew well initially (first month).

However, they are starting to show symptoms of dieback in the second month of growth.

There were no observed differences in dieback severity where seed of the same cultivar (Gayndah and Biloela buffel, Bisset

IN FOCUS

- Pasture comparison trial to investigate the relative tolerance of a range of available grasses and legumes.
- Management option trial in a completely affected (dead) pasture.
- Management option trial in an affected (not dead) pasture.

bluegrass) was sown with and without coating that included insecticide, at this stage of the trial.

Of the legumes sown, all have established and are growing well with no signs of dieback.

The management option trials started about 12 months ago.

Treatments tested

included burning; slashing; one-off cultivation; multiple cultivations over varying fallow length; fertilising; spraying either fungicide or insecticide; and sowing annual forages such as forage sorghum, lablab or oats after following.

Measurements from the first season have provided interesting insights into the effectiveness for each treatment.

Plant health measurements, as measured by a greenness index (NDVI), at the end of the pasture growing season (May 2019) indicated no impact of the burn, fertilise, slash or spray (either fungicide or insecticide) treatments in either trial.

The cultivated treatments, forage sorghum and lablab, were significantly greener

than the existing pasture at that time.

Plant biomass measured at the same time (May 2019) show no significant difference between treatments in the dead trial.

This is likely due to the high variability in pasture yield due to the natural regeneration that occurred during measurement period after completely dying out the previous summer season (2017-18).

In the affected trial, the burn, slash, fertiliser and cultivate treatments resulted in significantly lower biomass compared to the control (doing nothing).

Spraying with fungicide or insecticide did not reduce or improve pasture yield, compared to the control.

Despite producing healthy forage, the annual forage

options of sorghum or lablab produced low biomass yields due to the adverse impacts of late-season sowing and a lack of in-crop rainfall.

At the time of writing, the oats treatment is performing very well despite the dry seasonal conditions without any signs of dieback.

Results from these field trials to date indicate graziers could have options to re-sow areas affected by dieback with either annual forages such as oats or lablab, or perennial legumes such as butterfly pea, desmanthus or stylos.

These options can provide high quality feed and reasonable biomass yields, and so should be able to offset some pasture production lost due to dieback.

Fungicides or insecticides didn't provide any plant health or yield benefits in these trials.

Chemicals should not be used in commercial grazing paddocks, as none are registered for this purpose.

These trials will continue for the next couple of years to determine the longer-term impacts of the treatments.

If anyone wishes to discuss options for dealing with dieback, or the details of these preliminary trials, please feel free to contact Stuart Buck (07) 4843 2605 or Nick Brazier (07) 4843 2631.

For further information, please visit the Future Beef website at futurebeef.com.au/knowledge-centre/pasture-dieback.

■ Stuart Buck, principal agronomist (sown pastures), DAF Rockhampton, 0427 929 187.

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Summer spelling vital

There are no magic bullets for managing grazing and spelling, but here are a few things to consider that will remove some of the guess work.

SPELLING pastures over the summer growing season is critical for their long-term health and vigour.

When combined with stocking to carrying capacity, and adjusting numbers to the amount of feed available, long-term cattle production is maximised on a per head and per hectare basis.

CONSIDERATIONS WHEN SPELLING PASTURES

- Intensively managed, high-density grazing systems can reduce diet quality.
- Flexible spelling, depending on seasons.
- Avoid prolonged and high-density stocking to achieve spelling in other paddocks.

DIET QUALITY

Intensive grazing systems facilitate the ability to spell priority paddocks and control the duration and frequency of spell periods.

It is thought that having the ability to control where and when cattle graze, and at what intensity, can maintain pastures in a vegetative state and improve diet quality.

In theory, small paddocks and frequent moves should enable cattle to select the most nutritious and palatable components of the pasture, while improving litter incorporation into the soil and benefiting nutrient cycling and plant growth.

A high level of infrastructure and management

intensity is required to achieve this and it is often not practical on commercial properties.

A comprehensive grazing systems study was conducted in the mid-2000s, which examined pasture parameters and diet quality.

The study was led by Trevor Hall from DAF with funding from Meat & Livestock Australia.

Three systems, intensive, rotation and continuous grazing with some spelling, were monitored on nine properties in Queensland over four years.

All paddocks were of commercial size and the managers and owners developed the systems and made all decisions relating to grazing management.

The study found that intensive and rotational grazing systems reduced diet quality when compared with continuous grazing.

Crude protein and digestibility were significantly higher under continuous grazing, giving an overall predicted growth rate advantage of 0.1kg/hd/day.

The main benefit occurred when pastures were actively growing over summer.

The continuously grazed paddocks had an average size of 551 hectares and the cattle were present in the paddock for most of the year.

The rotation paddocks had an average size of 435ha with an average annual grazing of 149 days.

The intensively grazed



Department of Agriculture and Fisheries pasture researcher Paul Jones out in the field.

“Key guidelines include stocking around carrying capacity, matching stocking rates to the amount of feed available, ensuring evenness of grazing and spelling adaptively depending on seasons.”

Paul Jones

paddocks had an average size of 58ha with an average annual paddock grazing of 12 days.

It is thought that if the grazing period with high-density grazing is more

than two to three days then diet quality may be reduced.

The take-home message from the study is that using intensive grazing to spell paddocks may reduce diet quality.

PASTURE RESILIENCE

The study also showed that stocking rates, pasture yield and composition, and ground cover were not affected by the grazing system used.

The nine properties in the study were well-managed with regard to stocking rate and monitoring of pasture, soil and livestock.

Good grazing management does not require highly intensive forms of grazing, however, sufficient infrastructure to manage uneven grazing distribution and wet season spelling is required.

The Wambiana Grazing

Trial has also highlighted some detrimental issues.

A rotational spelling study showed that a three-paddock system where one paddock receives a wet season spell each summer, can lead to increased grazing pressure on the stocked paddocks during dry years and can reduce the growth rates of the cattle.

The trial is now examining adaptive management with a six-paddock rotation where up to five paddocks can be spelled over a summer, including minimising the area and length of spelling during dry conditions, to avoid excess grazing pressure on stocked areas.

The trial has shown the need for stocking at carrying capacity, flexible stocking and varying the area and length of spell with seasonal conditions.

MANAGING SPELLING

Management has to be flexible and based on short and long-term goals, seasonal conditions, land types and condition, infrastructure, labour capacity and classes of cattle.

Key guidelines include stocking around carrying capacity, matching stocking rates to the amount of feed available, ensuring evenness of grazing and spelling adaptively depending on seasons.

Avoid prolonged and high density stocking to achieve spelling in other paddocks, as it can compromise diet quality and pasture resilience.

For more information contact Paul Jones, senior scientist (pastures), DAF Emerald, 0428 103 923.

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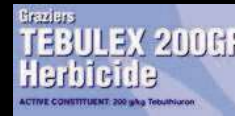
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Stocking rates in review

Fine-tuning their stocking rates and better managing nutrition levels of their Merino flock have proven invaluable to Peter and Elizabeth Clark.

HAVING an accurate understanding of your optimum stocking rate and nutrition levels is the key driver of Merino flock longevity and productivity.

That's according to Peter and Elizabeth Clark, who together operate the 12,000 hectare property, Leander, north of Longreach, where they typically run a flock of between 2800-3000 self-replacing Merino ewes and some wethers.

Over the past 40 years, the Clarks have discovered the benefits of fine-tuning their stocking rate and better managing the nutrition levels of their sheep by spelling country when they can and managing total grazing pressure (TGP) with exclusion fencing.

"For us, it was a lot of trial and error to work out the best stocking rate for different paddocks in different seasons," Mr Clark said.

"In the 80s, we ran too many sheep and were only achieving low marking rates.

"When we started to tweak the stocking rate, and bring it down in those underperforming paddocks, we started to increase our marking rates.

"We also itemised wool clip records across the different paddocks and adjusted our stocking rates accordingly.

"Sure enough, over time we were able to increase the wool cut on an individual

sheep basis and drive our marking rates up by about 10 per cent."

Pest control is another key element to boosting the nutritional performance of your paddocks, and the Clarks found a move to exclusion fencing in 2015 was an effective method to manage TGP.

"The quality and mix of pastures have improved dramatically, and we're seeing grasses we've never had before. Essentially, until we started managing for TGP on our property, we were inadvertently overstocking," Mr Clark said.

"When TGP is managed, we can effectively spell paddocks, run more sheep and mark more lambs."

Before the exclusion fence, the Clarks were only running very low numbers on desert country and reaching a lambing rate of only 80 per cent.

"With the fence, we're now achieving a lambing rate of 100 per cent and above, and we can adjust our stocking rates according to the land's needs - letting it rest when it needs to and boosting the long-term nutritional benefits of our pastures," Mr Clark said.

Nutrition and land condition are factors the Clarks keep a close eye on, opting to destock in the tough years to avoid degradation of their soils.

"Dry ewes are the first to go, followed by older ewes," Mr Clark said.



Peter and Elizabeth Clark operate the 12,000 hectare property, Leander, north of Longreach, where they typically run a flock of between 2800-3000 sheep.

“The quality and mix of pastures have improved dramatically, and we're seeing grasses we've never had before. Essentially, until we started managing total grazing pressure, we were inadvertently overstocking.

Peter Clark

Sorting ewes on a wet/dry basis is something that has also allowed the Clarks to dramatically boost the productivity of their flock.

"Each year, by wet/dry sorting our ewes at marking, we are able to eliminate all sheep that have any problems with producing a

lamb," Mr Clark said.

"Over the years, we have managed to build up a productive flock that we can sort efficiently at marking."

MANAGING MITCHELL GRASS AND STOCKING RATES AFTER DROUGHT

Rain was sporadic across Queensland in March and April, and while many areas have recovered, there are as many still drought affected.

Strategically managing Mitchell grass and stocking rates when rain arrives is a key part of recovering from drought.

Department of Agriculture and Fisheries (DAF) principal scientist Dr David Phelps, who is based at Longreach, says grass recovery is one of the most common concerns producers raise with him.

"For producers who have had good rain and are looking to restock, it's important to try to spell Mitchell grass for a minimum of six weeks before restocking," Dr Phelps said.

"Agistment is expensive and the temptation is to move stock straight back onto Mitchell grass, but long-term pasture levels will greatly benefit from spelling."

For those producers who have unfortunately missed relief rain, accurately estimating stocking rates and available feed is critical to protecting your pastures over the longer term.

"Ideally, Mitchell grass is never grazed to a tussock length of below 15 centimetres, as it is most responsive to rain when it has that length to it," Dr Phelps said.

While the need to rest paddocks after rain can lead to tough decisions around agistment and destocking, spelling allows grasses to recover faster and with less moisture.

For more information on nutrition, stocking rates and pasture management, visit leadingsheep.com.au.

KEEP IN TOUCH!

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Enquiries can be extended to leadingsheep@daf.qld.gov.au.

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The E-Beef Project is looking for landholders or commercial operators who want a helping hand to get the next great tool for beef production systems off the ground.

We are looking for landholders or commercial suppliers who want to trial technology to support cattle grazing enterprises.

This may include anything from implementing new methods to track stock such as GPS monitoring devices, to finding new ways to connect to the network.

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- access to a range of extension opportunities including field days and videos.

Applications with co-contributions will be viewed more favourably. All proposed trials must be in the Southern Gulf, Northern Gulf or Desert Channels regions.

For further information or to apply, visit <https://www.southerngulf.com.au/project/e-beef-smart-farming-in-northern-queensland/>.

Applications close 14th October 2019.

The E-Beef project is a partnership between Southern Gulf, Northern Gulf and Desert Channels NRM bodies along with Queensland Department of Agriculture and Fisheries

The project is funded by the Commonwealth Government's Smart Farming Partnerships Program, a component of the National Landcare Program