Note from our guest editor: Shaun Drabsch

Welcome to the first issue of the Northern Territory (NT) Rural Review.

Earlier this month, the Chief Minister announced his new Cabinet and the associated realignment of the Machine of Government arrangements. The new Department of Industry, Tourism and Trade encompasses:

- the former Department of Primary Industry and Resources
- Tourism from the Department of Tourism, Sport and Culture
- Licencing NT from the Department of the Attorney General and Justice
- most of the existing Department of Trade, Business and Innovation.

Bringing together these related functions will foster a greater level of agility, flexibility and quicker decision making across government with a clear focus on growing the Territory.

The government's goal to create a **$40 billion economy** by 2030 has driven the decision to group energy, tourism, resources and primary industries into one team. At a time when Australia is in recession, and the full impacts of COVID-19 continue to be realised, there has never been a more important time to achieve this economic growth.

The NT agriculture industry is a vital source of economic activity with important linkages to other sectors of the economy. Promoting and facilitating the development of this industry will be key to realising the government's goal - which will mean 35,000 new jobs in the Territory, and a strong economy that supports a safe and healthy environment for all Territorians.

I trust you will enjoy the refreshed format of the NT Rural Review – a result of stakeholder feedback received through our formal regional communications review.

NT Rural Review – September 2020

This issue is packed with the latest research and development, extension and key market information.

I look forward to working alongside you in the critical task of reconstructing the Territory economy into the most competitive place to do business across all industry sectors.

Shaun Drabsch
Chief Executive Officer
Department of Industry, Tourism and Trade.

Tipperary cotton field day a success

Region: Greater Darwin, Katherine Region | Topic: Horticulture

Sep 2020

Well over 30 growers and industry representatives attended a modern cotton field day at Tipperary station in July.

The well-attended field day, organised by NT Farmers, gave attendees a firsthand opportunity to see modern cotton being harvested. Tipperary staff also explained cotton nutrition, dryland irrigation, biosecurity practices for weed, pest and disease management, crop rotation and erosion control.

Growers had a chance to walk through the genetically modified variety cotton blocks and hear about the economic viability of cotton grown in the Northern Territory (NT). Cotton research and cultivation has a long history in the Territory and there have been numerous studies on growing cotton on a commercial basis. Research has included enhancing understanding of disease and pest resistance, crop yield and fibre quality to support industry viability assessments. Early indications are that the economics of dryland or irrigated cotton make it an attractive income diversification option on cattle properties.

The diversity of cotton crops allows many parts of the plant to be used from the lint, which is processed to produce yarn, and lint and seed by-products which are processed into oil, meal and hulls for human consumption, the production of soaps and cosmetics and as part of livestock feed. Cotton lint and seed is currently transported from sites in the Territory to a cotton gin in Kingaroy (Queensland) for processing, and industry has expressed strong interest in the development of a cotton gin in Katherine.

Senior Research Agronomist Dr Ian Biggs, spoke about the initial results from the 'Potential for Broadacre Cropping in the NT' project. The project is funded by the Cooperative Research Centre for Developing Northern Australia (CRCNA) and is collating historical broadacre cropping data, natural resource information and market

opportunities. It is also undertaking cotton modelling in a crop model called APSIM and is using cotton trials to validate model results.

More information

- Watch our cotton growing tips videos available on the Agriculture Division YouTube growing tips playlist
- Watch the 2020 CRCNA trial webinar in the Agriculture Division YouTube webinars playlist
- Watch episode 8: Spotlight on Modern Cotton webinar on the NT Farmers YouTube channel
- Read the Modern Cotton NT Industry Feasibility study on the Food Futures website
- Visit the CRCNA project page
- Contact Alex Peachey, Senior Extension Officer, DITT alex.peachey@nt.gov.au;

Webinar series, now available online

Region: Greater Darwin | Topic: Horticulture

Sep 2020

Amid ongoing Coronavirus (COVID-19) concerns, Department of Industry, Trade and Tourism (DITT), formerly the Department of Primary Industry and Resources) launched its first ever weekly webinar series, aimed at helping growers keep abreast of national and local agricultural projects.

The nine-week series, kicked-off in June with Dr Darsh Rathnayake, a research scientist unpacking the current biosecurity research into whether honey bees are able to introduce cucumber green mottle mosaic virus (CGMMV) into melon crops from infested hives.

The series featured eight industry specialists from around Australia covering a range of diverse topics from Northern Territory Hemp Industry Regulations 2020, spice growing trials, to melon food safety, broadacre cropping projects and water resources.

“By trialling new methods of engagement, we were able to facilitate the flow of information to local growers. This initiative demonstrates our commitment to developing the Territory’s agricultural industries by supporting growers with the latest knowledge, research, technical advice and skills – amid COVID-19 physical distancing requirements,” said Phil Hausler the Executive Director of Agriculture.

For those who missed the live webinars, recordings are now available on the Agriculture Divisions YouTube webinars playlist.

The projects are supported and delivered by multi-stakeholder groups including the Department of Primary Industries New South Wales, Department of Primary

Industries and Regional Development Western Australia, Central Queensland University, University of Southern Queensland, Hort Innovation, CRCNA, CRDC, GRDC, FutureBeef, Australian Mangoes and Melons Australia to name a few. DITT acknowledges the support of our partners; Commonwealth Scientific and Industrial Research Organisation (CSIRO), Northern Territory Farmers Association Incorporated (NT Farmers), Tipperary Station, Ruby Downs, Edith Springs Station, Mainoru Station, Oolloo Farms, Glen Arden and Cotton Seed Distributors Limited (CSD).

More information

Maddison Clonan
Research Scientist
Department of Industry, Trade and Tourism

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Spicing up the north - project update

Region: Greater Darwin | Topic: Horticulture

Sep 2020

Through the Cooperative Research Centre for Developing Northern Australia (CRCNA) and CQ University researchers, our growers and partners are trialling the performance of five different spice crops at sites across Northern Australia.

The results of the black sesame trial/harvest are in with the top-performing varieties identified!

The performance of black sesame varieties from AgriVentis Technologies at six different locations, with a range of conditions across northern Australia has been assessed. The yields ranged from 1.4 t/ha up to 3.0 t/ha depending on variety and location.

The highest seed yield recorded was in Biloela followed by Rockhampton, Katherine, Ayr, Darwin and Tully. The seed yield between the varieties varied significantly at Biloela, Rockhampton and Darwin, but did not differ between the varieties at Ayr, Tully and Katherine -showing a significant genotype by environment interaction.

These results lay an important foundation for the establishment of this new high-value cropping industry.

2020 winter crops

The winter crops, originally planted as a summer trial, are performing well with the crops relishing the cooler conditions.

Some interesting insights have been noted with the Burdekin trial planting the crops as seedlings using methods from the small-crop sector, while the Biloela trial planting caraway crop has recovered well from the setback of heavy frost.

The harvesting of cumin, caraway, kalonji and fennel in some regions commenced in August.

From left: caraway, cumin and kalonji plantings at the DITT NT trial site in Katherine.

From left: caraway, cumin and kalonji plantings at the DITT NT trial site in Darwin.

Next steps

The next stage of the research will involve on-farm verification of selected genotypes (from the first-year) to evaluate the adaptability of the variety to local farming conditions.

While the early results are encouraging, there are still some challenges that need to be addressed before full-fledged production can commence. These include weed control, optimisation of mechanical harvesting, and providing robust agronomic information - especially concerning optimum planting times on the different regions

and density of planting. These activities are built into a parallel project funded by AgriFutures,

More information

- Download the full sesame seed technical report on the CRNCA website. The results include detailed measures from each site on each variety's yield, biomass, seed oil content and agronomic performance.
- Watch the Spicing up the north project webinar on the Agriculture Divisions YouTube webinars playlist.
- Contact Tieneke Trotter, Strategic Partnership Manager, CQU t.trotter@cqu.edu.au if you are interested in becoming involved or joining as a grower.
- Contact Chelsea Moore, Industry Development Officer, DITT (Department of Industry, Trade and Tourism) chelsea.moore@nt.gov.au 08 8999 2323

Manipulating mango flowering

Region: Greater Darwin, Katherine Region | Topic: Horticulture

Sep 2020

As part of a Hort Innovation's latest mango industry capacity building project 'Building best management practice capacity for the Australian mango Industry (MG17000)', Department of Industry, Trade and Tourism DITT released a video providing insight into manipulating mango flowering.

The Manipulation of Mango Flowering video (below) features a compilation of tips from former Integrated production systems leader Dr Cameron McConchie, on the timing of various orchard activities to manage flowering for improved profitability, production and logistics.

More information

Watch the manipulation of mango flowering video as well as a range of mango growing tips videos on the Agriculture Divisions YouTube growing tips playlist

Contact:

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Sustainable vegetation management for rangelands

Territory Natural Resource Management's (TNRM) 'Sustainable Pastoral Business' program provides guidance and support to cattle producers to strengthen and develop their natural resource capacity. One of the aims of the program is to ensure the cattle industry adopts progressive land management practices focused on long term sustainability aligned with the growing public expectations.

Listen to Department of Industry, Tourism and Trade (DITT), former Department of Primary Industry and Resources Rangelands Program Manager Dionne Walsh, discussing sustainable vegetation management with TNRM's Andy Bubb. The podcast covers tools for producers and land managers to get the best environmental and economic out comes for their properties.

More information

Visit the Territory NRM website

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Darwin Agriculture staff move buildings

Region: Greater Darwin | Topic: Livestock, Horticulture, Biosecurity

Sep 2020

The Berrimah Farm Science Precinct redevelopment project recently hit a major milestone with the opening of the Field Services Building.

The new Field Services Building will house livestock and plant research, industry development functions and post-harvest research facilities. The new laboratory facilities will create an epicentre of excellence in northern Australia for agricultural research, diagnostics, and pest and disease surveillance and monitoring. These facilities will provide additional capacity for biosecurity incursion response – strengthening the Department of Industry, Trade and Tourism, former Department of Primary Industry and Resources) reputation for the best clean, green produce underpinning our current domestic and export markets and providing further opportunities to establish the Territory as a major producer and exporter of food and fibre.

The Darwin-based Agriculture Division staff have officially moved into the new Field Services building, located at Gate 2. Previously housed in several separate buildings, the plant industries and livestock industry development groups can now be found in the one location. Contact details (phone numbers and email addresses) remain the same.

New horticulture group leader

Region: Greater Darwin | Topic: Horticulture

Sep 2020

Welcome to Dr Sohail Mazhar, who joins Department of Industry, Tourism and Trade former Department of Primary Industry and Resources, plant industries team this month as the horticulture group leader, working on all aspects of horticulture in the Territory.

Dr Mazhar has previously held a role in the Queensland Department of Agriculture and Fisheries in Cairns and has extensive experience in horticultural research and development, including work in bananas, mangoes and avocados. His research has covered food safety, post-harvest physiology and supply chains and he has previously collaborated with the department on an ACIAR floriculture project.

More information

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Horticulture Group Leader
Department of Industry, Tourism and Trade

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New Jackfruit project to look at processing options

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Horticulture

Sep 2020

Tropical exotic fruit products are not always well understood by the retailers, wholesalers and consumers. Reviews of the Jackfruit industry have identified scope for 'edible' jackfruit products. Jackfruit are large and difficult to process due to their weight and sticky latex - a key barrier to the growth of the industry. The Sydney and Melbourne markets have a preference for jackfruit used both fresh and in cooked dishes, and may benefit from standardised packaging, and processing the fruit into ready to eat products.

There is a growing market trend towards products that align with environmental and social drivers, including plant based, meat alternatives. By changing how the fruit is offered to the consumer, such as through new products, we are hoping to tap into this trend and grow the jackfruit industry.

Working in partnership with Monash University through its Monash Food Innovation coupled with the Faculties of Engineering and Business & Economics, this AgriFutures funded project will evaluate individual jackfruit for physical and chemical characteristics which may be desirable for processed products. Whilst the project will not produce a commercialised product, the development of concept products is a key step in the process towards a commercial product.

More information

- Read the Northern Territory Tropical Fruits reports on the Agrifutures website:
    - 2004 NT Tropical Fruits Industry Market Opportunities

    - 2005 Exotic Tropical Fruits and Vegetables Category Marketing Opportunities
    - 2015 Value-adding options for Tropical Fruit using Jackfruit as a case study
- Visit the AgriFutures website
- Read a Jackfruit article by Matt Hall, Director Plant Industries, DITT

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Paddock Power gears up at Rocklands Station

Region: Katherine Region, Barkly Region | Topic: Livestock

Sep 2020 | Dionne Walsh, Rangeland Program Manager

There was excitement in the air as Department of Industry, Tourism and Trade Rangeland Program Manager Dionne Walsh and Senior Livestock Scientist Kieren McCosker rumbled down the highway in late August in a ute loaded with crates of high tech wizardry.

With the help of the station staff at Rocklands, they put GPS tracking collars on 140 pregnant breeders and 20 steers to investigate:

- How cattle use paddocks of different size and watered area.
- How far cattle are walking, with and without calves.
- How far from water calves are being born.
- How paddock usage patterns change through the year.
- Whether weaning rates, mortality rates and live weight gain are influenced by the above factors.

This is important as many breeder paddocks in Northern Australia are too big and under-watered to achieve optimum productivity. Walking long distances out from water to feed late in the dry season erodes live weight gain and body condition in breeders. In turn, the negative impact of poor body condition on re-conception and calf survival rates further reduces productivity. Some producers believe that high rates of calf wastage (>20 per cent) in large poorly-watered paddocks may be caused by cows leaving newborn calves to return several kilometres back to water, increasing the risk of predator attacks or dehydration. These are the issues that the Paddock Power project is investigating.

The ultimate goal is to provide strong evidence to support investment decisions for developing new infrastructure, reduce rates of calf loss and increase the kilograms of beef produced.

Above: Some of the pregnant cows fitted with GPS tracking collars at Rocklands.

More information

- Join our Paddock Power Facebook group
- Check out the Paddock Power project page on FutureBeef

We're also looking for good quality animal performance data from stations across northern Australia – contact us to discuss how we can analyse your data to see what your calf loss rates and reproductive performance is in paddocks of different sizes and watered area.

Contact us to discuss how you can get involved:

Dionne Walsh
dionne.walsh@nt.gov.au

Kieren McCosker
kieren.mccosker@nt.gov.au

Suspect seeds set for destruction in the Territory

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Biosecurity

Sep 2020

Territorians are being reminded to be biosecurity aware, following cases of unsolicited packets of seeds being received through the mail.

The seed packets have been arriving from Asia, predominantly from China, Malaysia and Taiwan, at addresses around Australia since August, prompting biosecurity fears. The origin, variety and sender of the seeds is unknown.

If you receive seeds in the mail that you did not purchase, do not plant the seeds or put them in the bin. Report it to the Plant Pests Hotline on 1800 084 881. The Department of Industry, Tourism and Trade is managing the collection of the seeds with drop off locations available across the Territory. Territorians are encouraged to complete a seed analysis and destruction submission form, however drop offs can also be made anonymously at seed collection points.

Imported seeds that do not meet biosecurity conditions can threaten our environment, agricultural industries and our backyard gardens. They can also carry invasive species or harmful plant diseases.

We all need to do our part to safeguard Australia from biosecurity pests and diseases.

More information

For more information on managing suspicious seeds visit the NT Government website.

Women in horticulture scholarships – EOI's open

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Horticulture

Sep 2020

Hort Innovation and Women and Leadership Australia are offering funding grants of up to $10,941 for women who work in the horticulture sector.

The grant funding supports women's participation in a leadership development program, and provides access to a range of leadership courses.

Emerging leaders, mid-level managers or women with senior/executive level experience are able to apply.

The grant funding is available to women working in levy and non-levy paying horticultural organisations, such as wholesalers, distributors, and research and development bodies.

More information

For more information go to the Women and Leadership Australia website.

Expressions of interest's close Friday 2 October 2020.

Advance your career with horticulture grants for young Australians

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Horticulture

Sep 2020

Hort Innovation and the 2021 Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry are offering a competitive grant program for young researchers, scientists, producers and innovators aged 18-35. The grant program funds research projects that benefit Australia's primary industries and in turn advances the careers of successful recipients.

The annual Science Awards, coordinated by the Australian Bureau of Agriculture and Resource Economics and Science (ABARES) consist of 10 industry Science Award categories, including horticulture.

Hort Innovation is the official Science Award partner and is offering a grant of $22 000 through the Hort Innovation Leadership Fund to a young Australian with an innovative research idea for the horticultural sector.

More information

For more information and to apply visit the Hort Innovation website.

Applications close 5.00pm Friday 2 October 2020.

Growers, send your best recipe to encourage Australians to #EatMoreAusVeg

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Horticulture

Sep 2020

AUSVEG has launched a #EatMoreAusVeg campaign to address the barriers to eating more vegetables and encourage consumers to eat more local vegetables.

An Instagram account @eatmoreausveg aims to provide practical information about a range of vegetables, in a colourful and engaging format.

Growers are encouraged to get involved by sending your best recipe ideas to feature on the platform, and/or tagging @eatmoreausveg in your Instagram posts to showcase your on-farm production.

In addition to encouraging people to eat more veg, posting recipes and sharing tips to reduce food waste, the AUSVEG campaign also aims to personalise the industry and promote vegetable farmers to show people where their fresh produce comes from.

More information

AUSVEG Communications Officer
Sophie Burge

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Nominations open for Australian Biosecurity Awards

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Horticulture

Sep 2020

Nominations are now open for round two of the 2020 Australian Biosecurity Awards (ABAs).

Delivered by the Department of Agriculture, Water and the Environment (DAWE), this round has four new award categories open for nominations:

- Environmental Biosecurity Award
- Community Award
- Education Award
- Dr Kim Ritman award for Science and Innovation.

Nominations close Friday 2 October 2020 and the awards will be presented at the National Biosecurity Forum in November.

More information

For more information and to submit a nomination go to the DAWE website.

Ehrlichiosis disease detected in Northern Territory dogs

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Biosecurity

Sep 2020

The disease ehrlichiosis, an exotic tick-borne dog disease, has been confirmed in the Territory.

Ehrlichiosis is a disease spread by the brown dog tick. It primarily affects dogs. It can result in death if not properly treated.

Caused by a tick-borne bacteria, ehrlichiosis requires veterinary treatment and early treatment provides the best chance of recovery. The bacteria is transmitted to dogs by the brown dog tick and can cause fever, lethargy, loss of appetite, weight loss, cloudy or sore eyes, pain and stiffness, bleeding disorders such as nosebleeds, and, if not properly treated, death.

In very rare cases, infected ticks may infect people. Infections in people are usually easy to treat.

Dog owners should have their dogs on a tick control program, regularly check their dogs for ticks and be on the lookout for signs of the disease.

Above: Dog with ehrlichiosis showing signs of sore eyes: reference

More information

For more information visit the NT Government website.

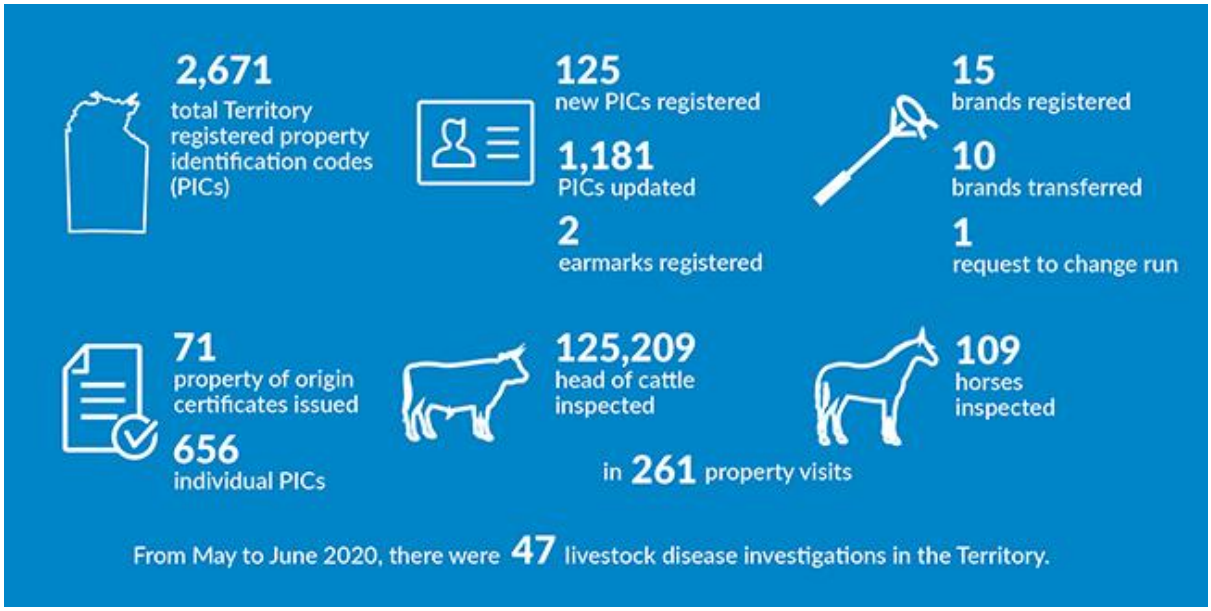
NT livestock biosecurity snapshot – May to June 2020

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Livestock

Sep 2020

The NT has a reputation for producing healthy livestock free from diseases and residues that could harm human health or impact our ability to sell livestock within Australia or overseas. This reputation is based on a rigorous biosecurity system that demonstrates that our livestock are fit to trade.

Livestock movement and identification requirements help to keep the NT free of these diseases which are found elsewhere in Australia or overseas, as well as ensuring whole-of-life traceability for many livestock species. From May to June 2020, there were:

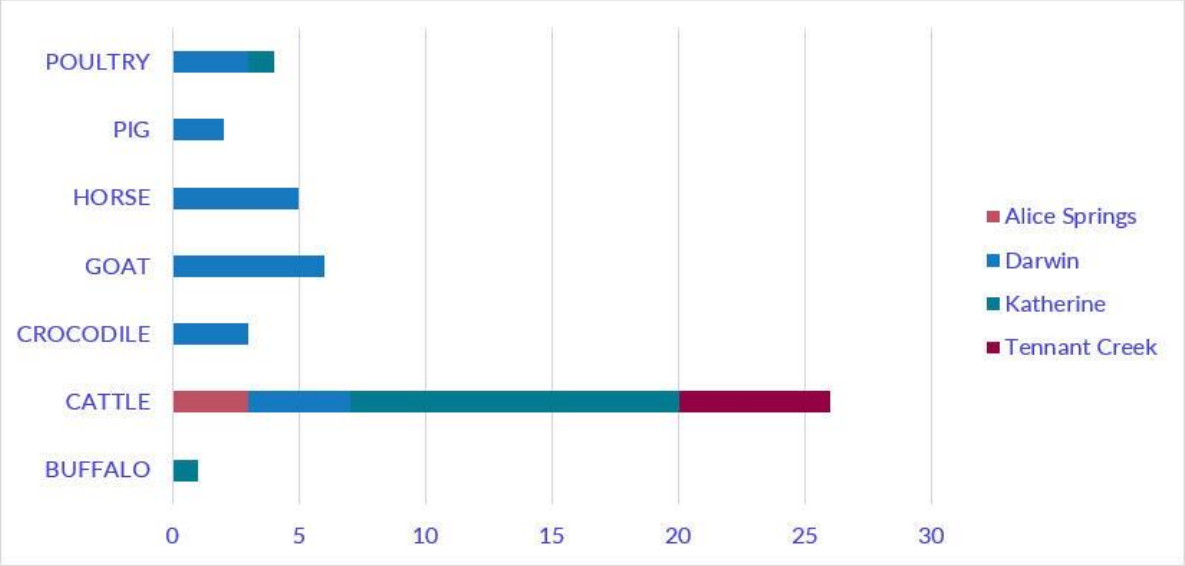


- 125 New property identification codes (PICs) registered and 1,181 PIC details updated of the 2,671 Northern Territory PICs registered.
- 15 New Brands registered, 10 Brands transferred and 2 Earmarks registered.
- 71 Property of Origin certificates issued for live export of cattle and buffalo in consignments from 656 Individual PICs.
- 125,209 head of cattle and 109 horses inspected, treated and certified for movement during 261 property visits.

The NT's livestock health status is supported by high quality disease investigations. These investigations enable notifiable diseases (those of national and trade significance) to be ruled out, or if detected, promote early and rigorous response in line with national agreements. National reporting of these disease investigations and surveillance is critical evidence to support international market access.

NT Rural Review – September 2020

From May to June 2020, there were 47 livestock disease investigations in the Territory.

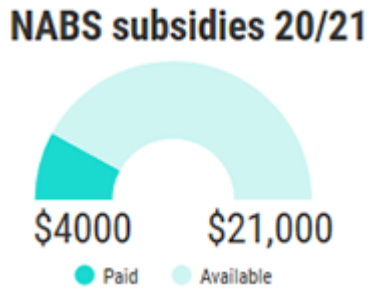


For a snapshot of national data, see the latest of the Animal Health Surveillance Quarterly.

Subsidies available for investigating disease in livestock

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Livestock, Biosecurity

Sep 2020



Did you know there are subsidies available to investigate diseases in Northern Territory livestock?

The **Northern Australian Biosecurity Surveillance (NABS)** project provides up to $2,000 per case to support livestock disease investigation on pastoral properties.

Producers can access this funding to cover veterinarian fees and mileage costs. Speak to your veterinarian for more information and to access this subsidy.

Case report – Barber's Pole worm and pestivirus in weaners

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Biosecurity

Sep 2020

During May, a Darwin property manager reported two steers out of a mob of three-year-old steers seemed to be wasting away over a period of six weeks. One steer died, while the other was very skinny, weak and scouring, and it was euthanased when it became unable to stand.

A post-mortem found a heavy burden of Barber's Pole worm (*Haemonchus contortus*) in the abomasum. A full range of samples were submitted to the lab, and showed a very high faecal egg count (FEC) of 1160 eggs/gram of faeces. The steer was also persistently infected with pestivirus. Three day sickness, Johne's disease and mad cow disease were ruled out.

Pestivirus (also called Bovine viral diarrhoea virus or BVDV) can reduce herd reproductive rates through infertility or abortion, as well as reducing immunity to a range of other diseases. The effect of BVDV depends on when the infection occurs in a cow's life. If a cow is infected while pregnant, the calf can become 'persistently infected' with the virus, and spread disease between herds. While there is a vaccine available for pestivirus, the risk of contact with persistently infected animals in extensive areas is lower due to the large areas that cattle graze. Consequently, the approach to managing the risk of BVDV will be different for every property.

The Barber's pole worm sucks blood from the lining of the stomach, which can cause major blood loss. Counts of over 200 eggs/gram of faeces are enough to cause illness in weaner cattle, especially if they have other diseases at the same time. These worms are found in the fourth stomach (abomasum) and can be seen with the naked eye. They are about an inch long, red and white, and look like human hair! Signs of Barber's pole worm can include pale gums, bottle jaw, weakness and death. The worm is a prolific egg layer and large numbers of worms can accumulate on the pasture (especially in the wet season). Barber's pole worm can be treated with commercial parasite injectables and pour-ons.

Above: Barber's pole worms present in the stomach contents of a weaner

Do you have mad cows? Bucks for brains subsidy available!

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Biosecurity

Sep 2020

Australia is currently free of TSE (Transmissible Spongiform Encephalopathies, or 'mad cow disease'). The National TSE surveillance program helps Australia demonstrate our freedom from Bovine Spongiform Encephalopathy (BSE) and scrapie, to meet guidelines set by the World Organisation for Animal Health which includes collecting and examining eligible cattle and sheep brain and spinal cord samples each year.

Cattle aged 30 months to nine years with any of these signs may be eligible for the subsidy:

- changes in behaviour and neurological signs
- excessive licking of the nose and flanks
- poor coordination (circling, staggering and falling)
- muscle tremors
- abnormal posture (abnormal ear position and/or head carriage)
- difficulty in rising (downer)
- paralysis
- excitability
- increased or decreased sensitivity to sound, pain, heat, cold or touch.

If you have cattle with these signs, contact the Department of Primary Industry and Resources Livestock Biosecurity Branch. You may be eligible to receive $300 for each

animal submitted. This incentive payment is for a maximum of two animals per disease investigation.

More information

Contact your regional Livestock Biosecurity Branch or visit Animal Health Australia's Bucks for brains.

Johne’s Beef Assurance Score (J-BAS) reminder

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Biosecurity

Sep 2020

 The J-BAS is a number from 0 to 8 which represents the risk of Johne's disease on a property. A high score means a low risk of Johne's disease.

Participation in J-BAS is voluntary. It is not regulated by government.

In July 2017, all Northern Territory properties without a biosecurity plan went to J-BAS 0.

Check your markets and find out if your buyers require a J-BAS.

- To sell or move cattle into WA, you will need at least a J-BAS 7.
- Live export markets require a property to be free from Johne's disease for up to five years. This is consistent with J-BAS 6.

To find out how to change a JBAS, see J-BAS Flowchart for NT producers.

Strong partnership enables rapid biosecurity response

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Biosecurity

Sep 2020

During a ride in the bush in July, a member of the Larrakia Rangers spotted a dead pig near a local rubbish dump. Thanks to recent post-mortem training, they were aware of the threat of African swine fever (ASF) and its transmission/risk pathways, and were able to recall the reporting mechanism for suspicious pig deaths.

The Department of Primary Industry and Resources Livestock Biosecurity Branch Veterinary Officer (VO) was notified and, with the help of the Larrakia Rangers, located the pig and began an immediate investigation. Due to its advanced state of decomposition, the VO quickly assessed the pig as having been dead for at least 24 hours. The VO was able to rapidly perform a full post-mortem and determine the likely cause of death to be trauma. However, given the pig's close proximity to the dump and the potential risk of exotic diseases, full samples were taken and submitted to the Berrimah Veterinary Laboratories, who promptly performed in-house testing to exclude ASF and another exotic disease of pigs called Classical swine fever (CSF) . These results were supported by additional testing at the Australian Centre for Disease Preparedness referral laboratory in Victoria.

ASF is an exotic contagious pig disease that has been confirmed in countries close to Australia including Timor-Leste. ASF and CSF are emergency animal diseases and outbreaks in Australia would have serious impacts on our pork industry.

Early detection of emergency animal disease is vital to minimising impacts on the Australian economy and lifestyle. The Emergency Animal Disease hotline is monitored 24 hours a day, seven days a week, to ensure that any response to potential emergency animal diseases is swift and efficient. This is supported by a dedicated team of Veterinary and Livestock Biosecurity Officers available to perform investigations in the field right across the Territory, and pathologists and laboratory staff who can quickly perform the appropriate tests at Berrimah Farm Science Precinct.

If you see sick or dead pigs or suspect any kind of unusual animal disease, call the Emergency Animal Disease Hotline on 1800 675 888.

More information

For more information on ASF, visit the Northern Territory Government website.

Reducing the impacts of feral pigs

Region: Greater Darwin, Katherine Region, Barkly Region, Central Australia | Topic: Biosecurity

Sep 2020

Feral pigs pose a significant threat to Australia's $60 billion agricultural industry, destroying crops and pastures, spreading weeds and disease, and preying on livestock. Feral pigs also cause serious damage to the natural environment.

The Commonwealth, State and Territory governments, together with the agriculture sector, environmental bodies and local communities, are committed to reducing the impacts of feral pigs in Australia.

In December 2019, the Australian Government provided $1.4 million over 3.5 years to Australian Pork Limited (APL) to establish a National Feral Pig Management Coordinator to facilitate the delivery of feral pig management approaches on a national, regional and local scale, undertake stakeholder engagement, drive effective investment and raise awareness of feral pig issues.

The National Feral Pig Action Plan will provide direction for the national coordinated and strategic management in response to the increased risks and threats that feral pigs present, using the framework of the National Wild Dog Action Plan.

More information

For any further information or to get in touch, please send an email to contact@feralpigs.com.au.

Good land condition pays premiums – the Central Australian story

Region: Central Australia | Topic: Livestock

Sep 2020

 The Old Man Plains Research Station (OMP) turns off steers each year as part of the Quality Graze research project. This project aims to identify optimal grazing systems that can consistently produce premium beef in arid zone rangelands, despite the highly variable climate.

Steers are grown out to 30 months of age before sending to slaughter around early April. From 2010-2019, high quality steers were turned off every year, in both above and below average rainfall seasons. This consistency was largely due to having an appropriate stocking rate and good land condition. With good land condition, even relatively small rainfall events will produce the useful green growth in pasture that steers need to develop enough fat for Meat Standards Australia (MSA) grading. Provided the steers have access to sufficient nutritious dry grass, these fat reserves can be retained through to slaughter. MSA is a 'tenderness guaranteed' grading program that grades beef based on eating quality.

In May 2019, 41 per cent of steers branded in 2018 were on track with building fat reserves, with P8 fat scores measuring 5mm or greater (a fat depth of 5mm at the P8 rump site is a threshold required for achieving MSA grading). By December 2019 this had dropped to 28 per cent. This was the first time there had been a decline in fat scores recorded in OMP steers since the Quality Graze project began. Low rainfall was only part of the reason.

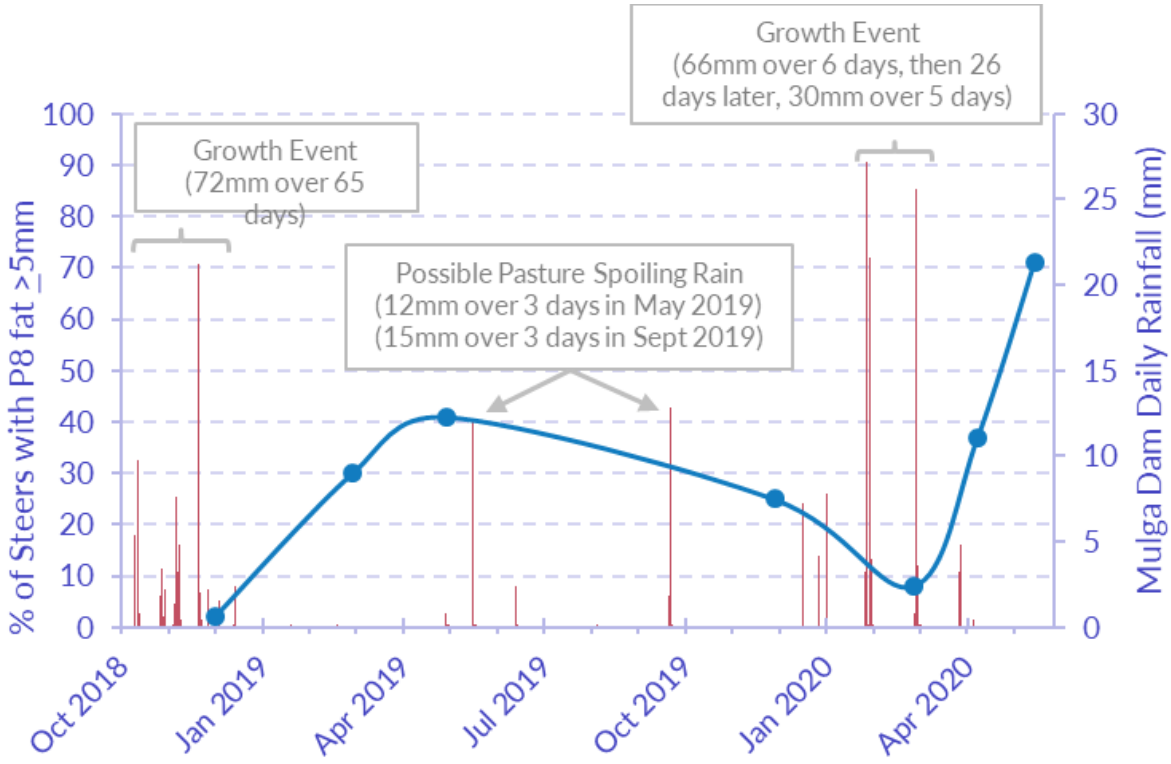
As anyone in the district will tell you, the prevailing conditions since 2018 have been dry to very dry with few growth events. However, a significant pasture growth event did occur in November 2018. This provided abundant standing grass that would

typically be both long-lasting and also capable of holding good nutrition for up to two years. This was the feed that led to the initial development of fat in the steers. In Central Australia, while pastures can retain nutritional value for extended periods, this standing dry feed can be spoilt by rain. Generally, if there is enough rain to spoil standing dry feed, then it is also enough to promote new growth. This is not always the case though, and a small rain event in May 2019 caused more harm than good. A total of 12mm fell over three days, generating very little new growth, while initiating deterioration in the nutritional quality of the remaining dry pasture. It is likely that this triggered the subsequent decline in fat deposits in the OMP steers. A similar rainfall event of 15mm occurred over three days in September, and probably caused further deterioration of feed quality.

Central Australia felt the effects of a positive Indian Ocean Dipole well into January 2020, with no rainfall and persistent very hot weather. When the 2018 branded steers were assessed in late February 2020, a mere eight per cent met the 5mm P8 fat depth threshold. This decline in fat depth related to declining feed quality and environmental stress. The steers were then combined into one mob in preparation for trucking and went onto feed in a paddock that hadn't been grazed for about nine months. At the same time, moderate falls of late summer rain (66mm in late January/early February followed by 30mm at the beginning of March) provided a supply of fresh green pick in drainage lines and in run-on areas. The steers benefited from this, and 38 per cent had a P8 fat score of 5mm or greater by mid-April. While originally targeted for sale in early April, the decision was made to hold the steers for an additional five weeks. When the steers were slaughtered in late May, 71 per cent achieved a P8 fat score of 5mm or greater. In total, 61 per cent of the herd achieved MSA grading, a much better outcome than seemed possible in February.

On first inspection, the good final fat scores might seem to be just a result of the late summer rain turning things around. However, there is a more complex and much more significant story here. The research program records detailed data on pasture as well as on cattle production. Linking these together shows just how important good land condition is for getting the most out of rain events. One of the key management activities at OMP is matching stocking rates to carrying capacity in order to maintain land condition. In this instance, good land condition maximised standing dry feed and sustained steer growth through two consecutive dry seasons. When the late rains came, the good land condition meant the country could quickly respond with green pick. This green pick, along with the feed reserved in the trucking paddock, enabled the steers to bounce back and be sold for premium prices.

Making the decision to reserve ungrazed feed can be difficult, particularly in dry years. However, on this occasion it provided the opportunity to hold steers for a little longer and achieve a much better return in an otherwise very dire-looking season.



Above: Percentage of steers achieving P8 fat scores 5mm or greater from calving in October 2018 through to slaughter in May 2020. The daily rainfall data shows the growth events experienced in the summers of 2018/19 and 2019/20. It also highlights the pasture spoiling rainfall events of May and September 2019 that are thought to have resulted in a decline in feed quality and subsequent loss of P8 fat.

More information

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This article originally appeared in FutureBeef.

Offline mobile map apps

Region: Barkly Region, Central Australia | Topic: Livestock

Sep 2020

Take the worry out of navigating a pastoral lease

Learning your way around a new patch of country comes naturally to some, but not so much for others. Fortunately, advances in technology have paved the way for contemporary solutions to an age-old problem.

The Australian outback is well known for its raw beauty and perilous nature. People becoming lost on a pastoral lease poses significant risk to human health and safety with search and rescue operations often costly with regards to time, human resources, equipment and lost productivity.

The information available to people navigating pastoral leases varies considerably from property to property, presenting increased challenges. Most leases have infrastructure maps with varying levels of detail and currency, while other leases have internal roads, tracks and water points marked with sign posts or objects such as tyres, drums and old jerry cans to indicate turn-offs.

Offline mobile map apps

As the name suggests, offline mobile map apps work without WiFi or network connectivity. Some popular apps like Google Maps and Apple Maps allow you to download maps while online, but this is generally limited to public roads and tracks, not infrastructure and internal roads on pastoral leases.

Integrating pastoral lease infrastructure maps with offline mobile map apps

Pastoral lease infrastructure maps can be connected with offline mobile map apps through the process of georeferencing. Georeferencing is the term used for identifying a point on the earth's surface and matching it to its location on a map using international standard coordinates.

Digital pastoral maps are usually in PDF format. A georeferenced map will have the coordinates of the lease stored within the PDF. When accessed through specific software applications, the GPS locations of anything within the boundary of that map are available.

How it works

When using any sort of navigation system, a dot generally appears on the screen to indicate the user's current position (this is a blue dot in Google Maps). When a georeferenced pastoral map is accessed through the appropriate mobile software application, a dot will also appear to indicate the user's position. The difference is that the map being viewed is a pastoral map that, if up to date, will show where the user is in relation to all marked infrastructure, such as tracks, fences, water points and yards.

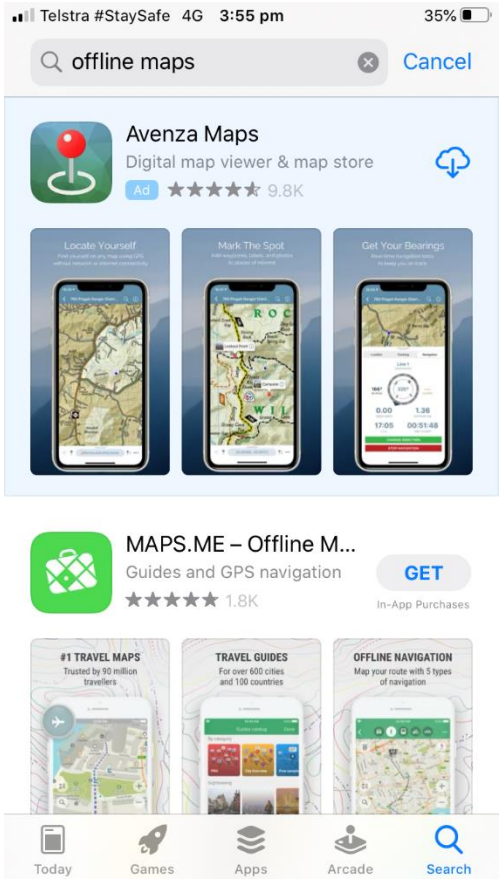
Other features of offline mobile map apps

There are a number of different mobile map app products and the features included depend on the individual product and subscription tier (some have free versions available). With certain products users can:

- plot and record information about locations
- import and export place marks
- measure distance and area
- georeference photos.

This means that, in addition to using the app for navigational purposes, it can be used to record the coordinates of broken infrastructure or where equipment was left behind (including a photo attached to that place mark on the map) so another user can locate it on their own.

Each product provides different options, and users should consider their own needs and speak to the manufacturers before choosing a product.



Screenshot of what the search shows when you look up “offline maps” on your phone in the App store.

Pastoralist experiences

“I have been using PDF maps in an app for around six years now and have found it a very valuable property management tool. We provide all our employees with a current map of the property, that includes all roads, fences and water points, and give them a rundown on how to use the app.

We have found it a very good safety feature for workers as no one can really get lost and with most station staff always having a mobile phone on them, they always have the ability to know where they are.

PDF maps save a lot of time. If someone sees an issue with stock or a broken fence or anything really, they can pinpoint the location so that we can get back there and fix the problem quickly without the need for the same staff member to go back to explain where it is,” said Ash Elsum, Flying Fox Station, Northern Territory

More information

- To get a GeoPDF copy of your pastoral lease map please email rangelands@nt.gov.au

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NT Rural Review – September 2020

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Connecting North Australian beef producers

Region: Barkly Region, Central Australia | Topic: Livestock

Sep 2020

FutureBeef supports sustainable and profitable productivity gains for northern beef producers. It is an ongoing partnership of the Northern Territory Government (the former Department of Primary Industry and Resources, now the Department of Industry, Tourism and Trade) with the Queensland Department of Agriculture and Fisheries, Western Australia Department of Primary Industries and Regional Development and Meat & Livestock Australia (MLA).

FutureBeef aims to be a one-stop shop for beef information, using webpages, eBulletins, webinars and social media. From the latest practical tools to new scientific insights, FutureBeef provides relevant and timely advice with a particular focus on supporting beef producers and livestock advisors.

The FutureBeef website already features over 1,000 pages of content, and research findings in:

- animal health and welfare
- animal production
- gazing land management
- people and business.

To connect with FutureBeef:

- Visit the FutureBeef website
- Subscribe online to the monthly eBulletin

- Like the FutureBeef Facebook page
- Follow FutureBeef on Twitter
- Subscribe to the FutureBeef YouTube channel

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The Central Australian team

Region: Central Australia | Topic: Livestock

Sep 2020

The halls of the Arid Zone Research Institute (AZRI) have seen some changes in recent months with staff movements bringing a new mix of knowledge and experience and creating a buzz around the office.

Angus Duguid

Earlier this year, we welcomed Angus Duguid to the Regional Director Southern role. Angus brings over 25 years of experience and a wealth of knowledge from working with the former Department of Environment and Natural Resources, and the Parks and Wildlife Commission in various environmental science management, assessment and monitoring roles. Angus is no stranger to AZRI and has been living and working in Alice Springs for nearly 30 years. He originally trained in agriculture and forestry before moving to the Northern Territory and working as a botanist and fire ecologist, and on wetlands and waterholes. Some readers may have met him on past field trips to your properties.

Alison Kain

We welcome back Alison Kain to the role of Pastoral Production Officer where much of her role will be helping her colleagues deliver extension materials on various topics and pastoral projects studied in recent years. Alison's drive and ability to simplify complex concepts, combined with her 'can do' attitude and corporate knowledge will be a great asset to the team. Despite only working part-time, Alison has already made an impact.

Kirsten Skinner

Technical Officer, Kirsten Skinner has already been working with the livestock industries development team for several months, managing and collecting research data. Kirsten previously worked on a feral fox research project in Central Australia. Before moving to Australia, she worked in Africa with large herbivores and carnivores. Lucky for us, she's happy to get up close and personal with the friendly AZRI cattle!

NT Rural Review – September 2020

What's your P status?

Region: Central Australia | Topic: Livestock

Sep 2020

The Meat and Livestock Australia (MLA) Phosphorus Challenge, now in its second year across the Northern Territory, aims to help producers and industry bodies build a better understanding of the potential for phosphorus deficiency in breeder herds grazing various types of country.

There can be significant economic and production benefit in determining accurate Phosphorus (P) status prior to making decisions about how or when to give P supplements to livestock.

The 2019 pilot study involved 68 properties, with five properties participating in the free testing in Central Australia, including AZRI. This year, three properties participated, including Old Man Plains Research Station. Chris Materne, Bryan Gill and Kirsten Skinner from AZRI had the opportunity to sample three different mobs from three very different land types on Aileron Station. The bloods have been spun and sent off to the lab, along with faecal samples from the cattle tested and soil samples from the paddock the cattle came from. Results are expected in the coming month. Managers Craig and Sarah Cook said that they hope to use the information to "back up what we already believe, that we should supplement P in the mulga and spinifex country, all year round. We were also unsure of the P status on some of our better heifer country, so we are interested in getting the results".

Left: Blood samples are collected from the base of the tail to assess Phosphorus levels. Right: Bryan Gill (DITT) and Craig Cook (Aileron Station) collecting blood and fecal samples from a selection of animals on various land types.

More information

Read the 2020 Phosphorus Challenge, Qld flyer.

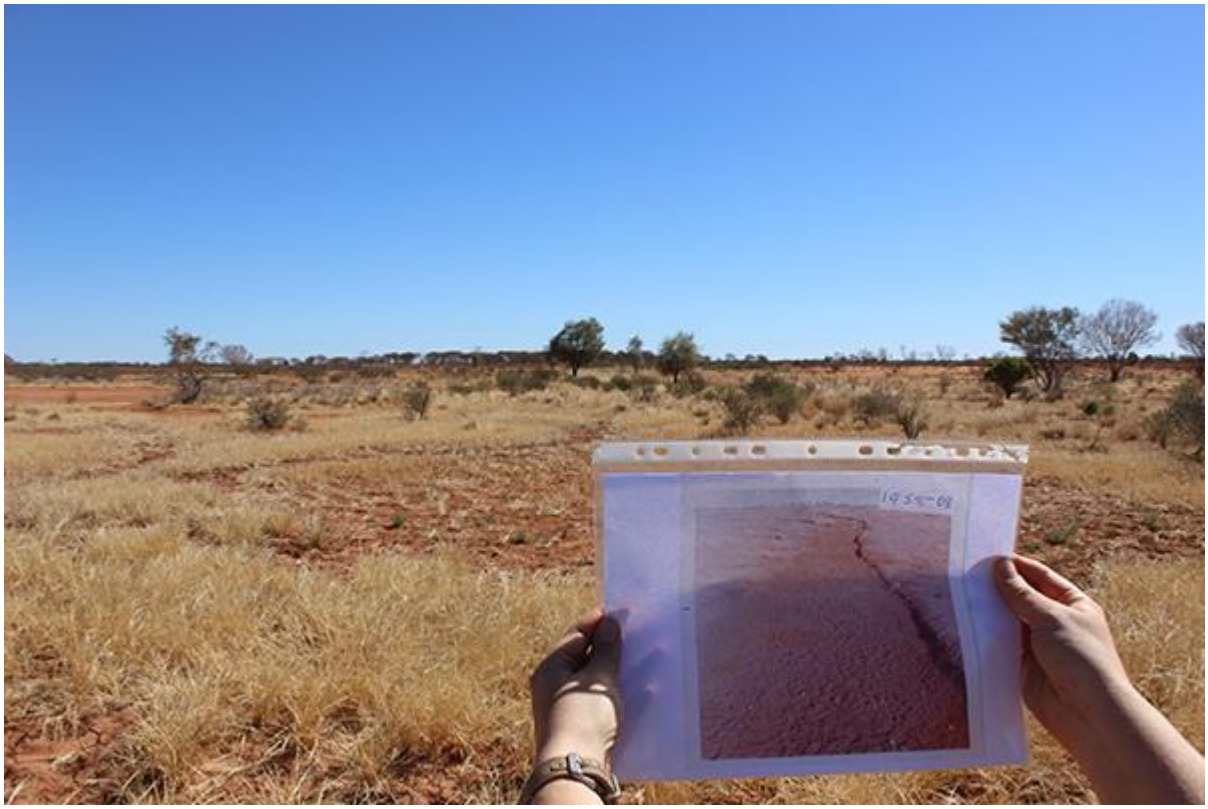
NT Rural Review – September 2020

Reflections from a lifetime of adapting regenerative agriculture to the desert context

Region: Central Australia | Topic: Livestock

Sep 2020 | Meg Humphrys (Pastoral Extension Officer)

On Wednesday 22 July 2020, some staff from the Arid Zone Research Institute and from Bushfires NT went to Woodgreen Station for a tour and to hear about the management strategies Bob Purvis has spent many decades perfecting. Woodgreen is a remarkable property, not because it's a 'good patch of dirt' but because it shows the fruits of incredible dedication and determination to restore land and life. Bob has managed Woodgreen for 60 years and has seen many successes and failures in his time there. Today, while there is always more to learn and do, Bob's legacy of hard work and true grit can be appreciated by all that visit.



Above: This area was very degraded in the late 1950's to early 1960's as shown in the old photo. By reducing stock numbers and building banks Bob Purvis has seen perennial grasses return in association with restoring topsoil fertility and allowing plant succession to occur.

Above: Bob has built over 1200 banks on his property to capture fertile topsoil or ‘the fines’ as he calls it. He says many areas on his property were down to the B Horizon which won’t grow any perennials, let alone annuals so he had to slow the movement of water to reduce erosion and allow the good soil to accumulate again.

Above: Bob uses fire a lot for land management. This site was once dominated by mulga but planned burning over the last 50 years has created a more open ghost gum grassland with a diverse range of grasses and forbs which are much more nutritious for cattle.

Innovation or realisation?

We are all searching for answers to age-old questions, for innovation to make things quicker and easier, or for 'the next big thing', but after years of experience, Bob would say there is no silver bullet. At Woodgreen, success has only come from years of trial and error, and hard work. Bob has tried many things, especially in his early years of being in charge in the 1960s, when he was trying to figure out how to bring productivity back to the land after 30 years of poor management that had created a mini desert. Knowing he couldn't do it alone, Bob spoke to advisors, scientists and government representatives, anyone he could find who might help him on his path to restore his property back to productivity, back to representing the station's name – Woodgreen.

Adapting the tools available to the situation at hand

Bob still recalls the names and stories of the numerous people who came to offer advice on regenerating Woodgreen. Unfortunately, not one of those people had the silver bullet Bob was originally looking for. Over time, Bob realised the skills and knowledge of each person could only help with some pieces of the puzzle. It was up to him to put the pieces together, in order to solve this giant land management jigsaw. He took the time to understand the research and management techniques of the various advisors. Not only did he observe, he got involved, asked questions, and posed alternative solutions to them. He couldn't have done what he's done without interacting and adapting those solutions to his place and situation, because no one knows a pastoralist's place better than they do.

Many of these people were pioneers in their fields of sustainable or regenerative agriculture, but their methods had been developed in different environments under different conditions. Yeoman's Keyline System is a good example. It aims to enhance carbon cycles and build top soil, accelerating the way soil builds fertility, but has been developed and mostly used on the east coast in higher rainfall areas. Another regenerative agriculture pioneer, Peter Andrews, has developed practices for restoring productivity to land in the Hunter Valley region. Bob doesn't discount these people's knowledge and skills but takes their principles and adjusts them to his land and what he has observed over the years.

Observation is key

Born in the 1930s, Bob grew up in a world without digital technology, when droving was still a common practice and things like telemetry weren't even thought of. He has spent many years on horseback droving cattle on Woodgreen. He observed what the animals ate, what plants they favoured and what they would eat when all the preferred plants were gone. He looked at the slope of the landscape, where the water ran and how it ran. He saw dust storms, birds, fires and feral animals. In those days, they would drove cattle at just 8kms a day, a pretty slow pace compared to mustering life today. For anyone who has spent time droving or even walking in the bush, you will know that you see things you don't see on a bike, in a car or from the air. Hearing Bob speak of those years, you get the impression they were pivotal in laying the foundations for the principles that govern his approach today. Through observation and some real analytical thinking, Bob developed a strong understanding of how his landscape/ecosystem functions and how it relates to pastoral activities. Very few people today get the opportunity to see things at that pace so they may only see part of the story. The consequences can be mistakes in both interpretation and management that do not produce the desired outcomes.

Measure your progress

Bob judges the condition of his land very simply. He has a 'species test' for the different land types on Woodgreen. The desired number of species has been determined over many years of observation. On 'fattening country' he aims to see 10 palatable species at any one time, although seven is ok. In the less productive land types, where cows are provided with a mineral supplement, he aims to see seven palatable species at any one time, five is ok, while three is starting to be of concern. On the low productivity areas on the west of the property, he aims to see five palatable species. If he sees more than these targets then that's great but when he sees fewer, he knows he needs to move cattle and rest the country until after the next rain. Otherwise those palatable species won't return in the abundance he wants to make his cattle fat. Palatable perennials are the most valuable as they will respond more readily to even small amounts of rain. If the perennials are grazed too hard, then like the annuals, they need enough rain to restart from seed.

The recent visit to Woodgreen had many learnings for participants and each person took away their own key messages. My interpretation is that you must start with a goal that will stand the test of time; an overarching vision that drives you. Bob's goal was to restore the land to productivity so he could live comfortably without being a slave to the bank and he wanted the freedom to manage the land as he saw fit.

Where to start?

We can all agree that there is no 'one size fits all' to achieve the goals of all properties, but learning, observing, trialling, evaluating and tweaking are all part of finding what will give you the desired outcomes. The bottom line – money - is generally a limiting parameter and it is important to be confident that actions you do take will be of financial benefit to your business. Pick your battles and identify where

change will have the biggest impact. It may not be possible to do it all but you need to start somewhere. Having a goal is a great place to start. You must then figure out what will be pivotal to achieving that goal. For Bob to achieve his goal, he identified that getting the stocking rate right was most important.

Historically, pastoralists were required to have a minimum stocking rate. Bob believes that regulators initially recommended a stocking rate three times higher than he now considers to be appropriate as the long-term carrying capacity of his land. His thoughts haven't changed much over the years on what that number is, but today he stocks his property to the level he thinks is appropriate, give or take a hundred or so head, depending on the season. He says the previously recommended higher stocking rate was detrimental to the land and his ability to achieve his goals. He highlights that it can take only a few dry years with high stocking rates to do damage what it will take 20, 30 or 40 years to repair. That timeframe can be as much as a generation of people and it's just not worth the risk.

How Bob achieved his goal certainly evolved over time but the primary goal he started with is still at the heart of everything he does. He now has a property/business that is manageable, productive and financially stable. A productive herd and low cattle losses ensure a reliable number of quality animals being turned off every year. He has a good relationship with the abattoir because they know the consistency and quality of his product. The immeasurable, and perhaps the most valuable, commodity of all is peace of mind. Bob isn't worried about his business, even in these dry times. The roads and fences on Woodgreen are in good nick and require little maintenance because they are built to last. Windmills pump sufficient water to the cattle, with only the occasional need to get a motor going.

Working smarter, not harder

There are moments from your younger, formative years that stick with you. I remember being told by my grade four teacher "work smarter, not harder". I have tried to carry that with me in my approach to life. The security in the production system Bob has created is an amazing legacy for his family, and it has taken years to get Woodgreen to this stage. His children will be able to reap the rewards of his hard work, dedication and vision. The wealth of knowledge he has given them about their patch will be the longest lasting gift of all.

Understanding the rainfall forecast for summer 2020

Region: Central Australia | Topic: Livestock

Sep 2020 | Alison Kain (Pastoral Production Officer)

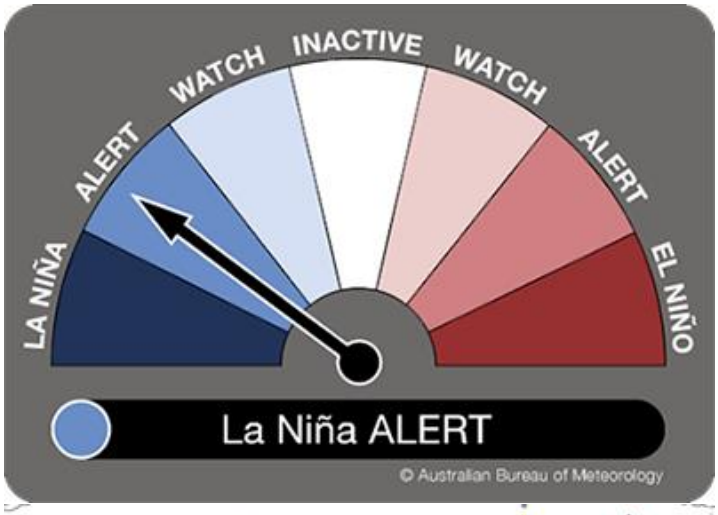
A senior climatologist explained that it will always be difficult to predict rainfall in places like Central Australia, because we are right in the middle of the continent. The moisture for rain comes from the oceans, and by the time it has travelled over our vast, hot, dry continent it is difficult to say how much moisture will be left. Wind speed and direction, temperatures and frontal systems will all influence how and when the rain falls.

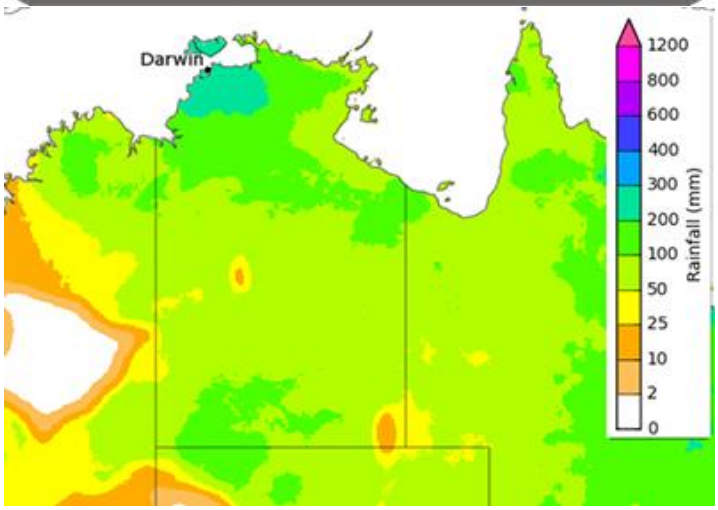
What we do know is that the global climate drivers such as the Indian Ocean Dipole (IOD) and El Niño Southern Oscillation (ENSO) are very good indicators of how much moisture is likely to be available for local weather systems to tap into. As the name suggests, the IOD relates to conditions in the Indian Ocean, while ENSO describes conditions in the Pacific Ocean. If there is a good source of moisture, then obviously there a better chance of moisture-laden air making it to Central Australia. It's worth paying attention to the status of the climate drivers.

From about September 2019 until January 2020, Central Australia experienced one of the hottest, driest summers on record. This can be largely attributed to the very strong, positive IOD that persisted until nearly the end of January 2020. It's worth noting that once the IOD broke down, the rainfall in late January to March was much closer to normal for many areas in the region. ENSO was neutral for the summer of 2019-20.

As we approach the summer of 2020-21, most of the global climate models suggest that a La Niña event will form in the equatorial Pacific by about October. The Bureau of Meteorology (BOM) has issued a La Niña alert (Figure 1) which means there is a 70 per cent chance of a La Niña event forming in the coming months. La Niña is often, but not always, associated with wetter than average conditions in Central Australia. It also increases the chance of getting useful rain in early summer. In the past, some La Niña events have meant increased rain in eastern Australia but Central Australia missed out. On the other hand, all the really wet years in Central Australia (such as 1974, 2000 and 2010-2011) were La Niña years. Figure 2 shows the outlook scenario for the period September to November 2020 (as of 13 August 2020). For many properties, February is historically the wettest month of the year on average. An early start to the season increases the chance of achieving maximum pasture growth if effective follow-up rain events occur.

NT Rural Review – September 2020

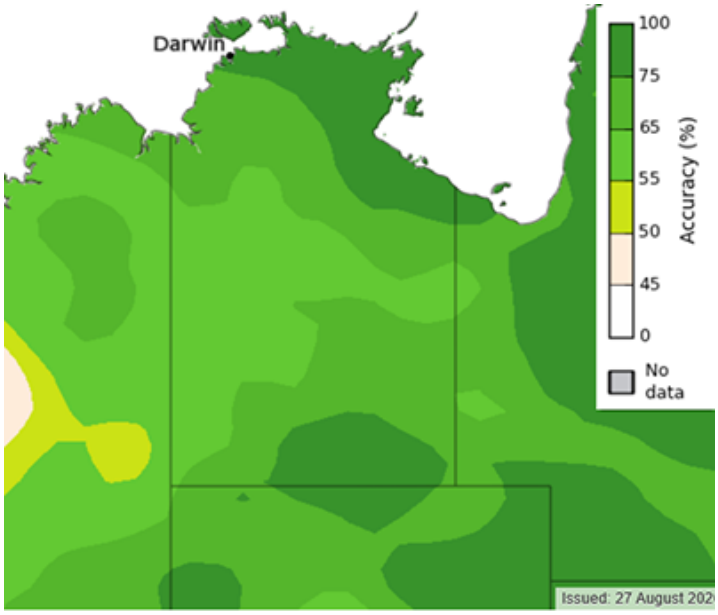




Left: (Figure 1) The Bureau of Meteorology have issued a La Niña WATCH indicating the chance of La Niña forming in 2020 is around 70%— roughly three times the average likelihood. www.bom.gov.au.
Right: (Figure 2) Rainfall totals that have a 50% chance of occurring for the period September to November 2020. www.bom.gov.au

Extended or prolonged growth events are rare but extremely important in Central Australia. Many of the perennial pasture species will only germinate and establish strongly under these conditions, making it a critical time for looking after land condition.

There is always some uncertainty in the climate forecasts, in fact, all BOM forecasts have a 'skill' map attached so you can see the historical accuracy of the forecast (Figure 3). Having a general understanding and awareness of the global climate drivers definitely provides useful information for pastoral managers.



(Figure 3) Historical skill for rainfall forecasts for the period of September to November. www.bom.gov.au

Management implications for a La Niña event

After such a prolonged dry period, a lot of perennial grasses have been weakened or may have died. Seed stores for annual grasses are also likely to be very low. A La Niña event could allow for excellent pasture recovery, provided that grazing is managed to ensure seedling establishment and seed production. The first priority is to allow germinating plants time to mature and set seed prior to grazing. Grass seedlings are like calves, they need to be protected, fed and watered regularly so they can grow to their full potential. A strong, mature perennial grass tussock has the potential to survive for ten years in the landscape, sometimes for much longer, but only if they get a good start – much like a quality heifer!

There are bills to pay

When production has been low for a while, there is a lot of pressure to capitalise on pasture growth. Sometimes it is easy to see that changes need to be made but it can be difficult to know where to begin. Starting small might seem more achievable and affordable. If there are good rains from a La Niña summer, some management options for 2020-21 might be to:

- **Spell only the most productive paddock**
  Got some really sweet country and it's all in one paddock? Destocking this paddock could boost land condition and production for years to come.

- **Implement a two-paddock rotation using existing paddocks**
  Muster two paddocks. Keep only the very best genetics and sell the rest. Put the retained herd in one paddock only, ensuring safe carrying capacity is not exceeded.

- **Turn off selected watering points**
  In very large paddocks, turn off the water point closest to the most productive land type to help reduce grazing pressure.

- **Build a fence**
  Look at existing land types and infrastructure. Some locations lend themselves to fencing off sweet country for a summer spell.

- **Keep only the very best stock.**
  Retain only quality breeders. Aim for a higher calving rate and improved weight gains.

Above: The photo on the left is from 2006 and the photo on the right is from 2014. These years had similar rainfall (close to the median of 240mm) but improved land condition led to an increased pasture response in 2014. Spelling during the 2010-2011 La Niña event was the catalyst for the land condition improvement. Photos: C. Materne.

What if it is only one good year?

Avoid the trap of allowing your herd to eat everything in sight. Leaving some grass in the paddock is not wasteful from a production viewpoint as pasture grown in Central Australia has the unique advantage of retaining its nutritional value for up to two years. That means you have production this year and production next year. If all your grass gets eaten in the first year, then you are back to square one, perhaps even worse off because you 'used' the seeds for this year's germination but didn't give plants the opportunity to produce much new seed.

Take-home message

Stocking rate decisions made this year could ultimately determine long-term land condition for paddocks/stations. Pastures have taken a hit in the past few years and it is important they are given the opportunity to recover when it rains. Now is the time to plan how you'll ensure the 2020 seedlings grow up to be your most fertile and productive grasses!

More information

For more information on pasture growth and seasonal outlooks for Central Australia, subscribe to the quarterly NT Pastoral Feed Outlook.

CASH kicks off

Region: Central Australia | Topic: Livestock

Sep 2020

Recently, the department had the opportunity to once again host Bruce Maynard, a passionate farmer and co-developer of the Maynard and Revell self herding and self shepherding management practices.

Part of the Central Australian Self Herding (CASH) five year project funded by Meat and Livestock Australia, Bruce, accompanied by Pastoral Extension Officer Meg Humphrys, visited Lyndavale and Palmer Valley Stations to discuss how self herding could assist them by solving problems through animal behaviour.

The self herding method uses stress free stockmanship to get desired outcomes. Anxious, stressed cattle can cause production losses on properties - particularly in the transport phase of the production system. Cattle in Central Australia typically travel a long way to market and ensuring they are as stress free as possible for the journey ahead will help them quickly get back onto feed and water at the other end.

One of the stress free stockmanship methods was demonstrated through an active de-stressing activity with the cattle in the yards. The activity is designed to get them more relaxed and alert to what the humans are trying to tell them, as well as drinking and eating without a fuss. Ensuring the cattle are not anxious is key to making the principles work.

CASH is designed to also help get cattle to stay at new waters or venture into ungrazed or less grazed areas that are not their home range by using 'attractant stations'. This is particularly useful in dry times when producers may be opening up new water points. Some producers already use lick and other supplements to get cattle to stay in new yards for a few days to let them know their new home isn't so bad. However, self herding takes it one step further by adding visual, audio and smell cues, taken from their old home water, to establish a sense of familiarity while diversity is also at play.

Self herding has been successful in Western Australia and at Kidman Springs in the Victoria River District in changing the 'home range' of cattle. Cattle, much like humans are creatures of habit and unless encouraged to venture out, they are unlikely to change - even if stressed from lack feed in their normal grazing areas. Self herding principles help cattle transition to new areas or feed on their own accord before conditions get too tough reducing the stress on you and your herd.

Above: Bruce talking to producers in the yard about actively de-stressing the cattle.

More information

- Visit the self herding website and the Kidman Springs self herding trial page on the FutureBeef website.

To secure a spot on Bruce's next visit at the end of September contact:

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Pastoral Extension Officer

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Investigating bottle teat in calf loss

Region: Katherine Region, Barkly Region | Topic: Livestock

Feb 2023 | Tim Schatz, Principal Livestock Research Officer

The CalfWatch project being conducted by the Northern Territory Department of Industry, Tourism and Trade (DITT) the former Department of Primary Industry and Resources, is using new technology to remotely monitor calving and investigate calf loss.

The study is being conducted at Manbulloo Station near Katherine in the Northern Territory (NT) in a 2,215 ha native pasture paddock that NT DITT leases.

Birth sensors and global positioning system (GPS) tracking are providing insights that were not previously possible. Pregnant cows are fitted with birth sensors that send a signal to researchers when the cow starts calving, and GPS tracking collars that allow the cows to be found. Cows are observed with minimal disturbance a so their behaviour is not greatly impacted

During the first year of the project in the 2019/20 calving season, calving outcomes were determined for 208 cows. The overall calf loss from the pregnancy test to weaning was 17 per cent in mature cows, of which six per cent was due to bottle teat. One of the preliminary findings from the first calving season is that bottle teats are a bigger problem than we realise.

Above: Two Brahman cows in the Calf Watch project with severely enlarged udders known as bottle teats, observed days after calving.

Bottle teat is a condition affecting cows where the teats on the udder become enlarged . When this occurs, it can be difficult for calves to get their mouth around the teat to suckle. This can result in the calf missing out on colostrum, the first milk produced by the mammary glands following delivery of a newborn, and with the calves dying from malnutrition.

Many cows with bottle teats are likely to be undetected in northern beef herds resulting in calf loss over multiple years. A number of the cows that lost their calves were observed to have bottle teats shortly after calving, but several weeks later the

teats had resolved themselves and looked normal again. As a result it is unlikely that these cows would have been identified as having bottle teats at a muster several months later.

Numerous studies have found that bottle teats increases calf mortality. One study conducted in Queensland with Brahman and Tropical Composite cows found that the odds of a calf dying were more than four times greater if their mother had bottle teats (Bunter *et al.* 2014).

The likelihood of calf death is higher if a calf is weak at birth and if all teats are enlarged. A study with *Bos indicus* cross cows in central Queensland found that calf loss was not significantly increased if a cow had one to three enlarged teats, but was much higher at 49 per cent compared to 6 per cent when cows had four bottle teats (Frisch 1982).

Another Queensland study where post mortem examinations were carried out on cows with bottle teats found that many had mastitis. Mastitus was considered secondary in nature to calf death with bottle teats considered to be most likely due to anatomical defects such as problems with the ratio of connective tissue and muscle in the teat wall (Holroyd 1987).

Studies have found that bottle teats is moderately heritable d (Bunter and Johnston 2014; Wolcott *et al.* 2017). Therefore, it is a good idea to cull cows with bottle teats to avoid them losing more calves in future. This may also help in them not producing daughters which develop bottle teats.

More information

For more information go to the FutureBeef website.

Choosing the Right Bull (Livestock Industry Development)

Region: Katherine Region, Barkly Region | Topic: Livestock

Sep 2020 | Eleanor Fordyce, Beef Extension Officer, Katherine

Above: Top price bull sold in the annual Katherine Bull Sale 2020.

When it comes to choosing a partner, you typically don't throw caution to the wind and choose any person who catches your eye! You have to understand what you're looking for in a partner, identify deal breakers, consider the longevity of the relationship and make sure their genetics are what you want to include in your future family.

The process for choosing a partner is the same when choosing a bull for your herd; you need to make sure they end up with the best possible bull .

Despite COVID-19 restrictions, a little homework can go a long way when selecting your next herd bull. Here are our top four tips for selecting premium bulls:

Long-term profitability

The bull may not be around forever, however, his genetics could potentially influence your herd production for the next 10 years. It is essential to have a well-planned breeding objective strategy to ensure the profitability of your enterprise based on your chosen target market. Depending on the target market to which you are catering for, there will be different key performance indicators which you will want to select.

Genetics, genetics, genetics!

Meeting the family is usually a pretty big deal, and gives you the opportunity to scope out the genetics of their breeding line! Estimated Breeding Values (EBVs) are a great tool to help you identify what traits align with your breeding objectives. EBVs give the buyer an objective comparison between bulls from a range of studs and information regarding the genetic contribution a bull will make to a herd. EBVs are a prediction of the likely performance of the progeny and become more precise with greater numbers of progeny data entered into the database. Utilising EBVs in conjunction with a Bull Check Evaluation will ensure you are maximising your investment!

Balance and deal breakers!

Let's talk about compromise! While not impossible, you do limit your options if you aren't willing to budge and compromise on some traits. Balancing the traits of bulls and cows in deciding which are most important to meet your breeding objective, deciding if the fault in each prospective bull is going to be a deal breaker, and deciding on the price you are willing to pay are essential to establish before sale day. This is why bull selection is all about the homework!

Fertility

The Bull Check Evaluation is imperative to make sure that your bull can efficiently and effectively pass on his genetics in a short mating window. This approved veterinarian assessment evaluates the structure, conformation and functionality of the entire bull, including the semen. It is important to note that whilst a BullCheck examination indicates that a bull will produce calves, it doesn't provide information about what traits he will pass on to his progeny. Used together EBVs and BullCheck results should enable you to objectively rank bulls in a sale from most to least preferred.

It is so easy to be carried away with an auction with your list of criteria based on your breeding objective and the price you are willing to pay for each category. Doing some homework before a sale should equip you with all the information to make sure you make the best bull buying decisions to achieve your breeding objective.

Fall armyworm (Biosecurity)

Region: Katherine Region | Topic: Biosecurity

Sep 2020

Fall armyworm (Spodoptera frugiperda) is a caterpillar pest that feeds in large numbers on a wide host range of more than 350 species of plants, including sugarcane, millet, rice, maize, sorghum, cotton, wheat, vegetables and fruit crops.

Fall armyworm can cause significant economic damage in a short space of time and produce several generations in a season.

Besides their reproductive capacity, the adults are capable of flying long distances of up to 100 kilometres in a night. They can also spread by movement of infested produce by air, road or sea.

Distribution

Fall armyworm is native to tropical and sub-tropical America. Initially detected in Africa in 2016, it has since spread through more than 30 countries, recently in late 2019 moving through South East Asia and towards Australia.

In early 2020, it was found in the northern Torres Strait Islands and has since been detected in north Queensland. At the end of March 2020 its presence was confirmed in Northern Territory (NT).

Above: Fall armyworm adult male in resting position ©Mark Dreiling/Bugwood.org - CC BY-NC 3.0 USBY 3.0 US

Appearance and life cycle

Adult females lay eggs onto the under surface of the lower leaves usually during the first four to five days of life.

Eggs are circular, 4mm in diameter, cream in colour when first laid but turning light brown prior to hatching.

Eggs are laid in single rows of 100-200 and covered with 'furry' scales and each female can lay up to 2,000 eggs in a lifetime.

On hatching, the larvae are green with black longitudinal lines and spots. As they mature they can be either green or a brown colour with black longitudinal lines along the body and around the spiracles. They also have numerous black hairs.

Left: Fall armyworm egg mass on cotton ©Ronald Smith/Auburn University/Bugwood.org CC BY 3.0 US
Right: Fall armyworm larva on cotton ©Russ Ottens/University of Georgia/Bugwood.org CC BY 3.0 US

Fall armyworm pupae are approximately 13-17 mm in length, reddish-brown and shiny. They are usually found in the soil under plants. If the soil is too hard, the larvae may pupate amongst leaf debris.

The sixth larval stage (instar) can grow to 45mm in length, with a noticeable upside down Y-shaped yellow pattern on the head and four black spots in a square shape on the last abdominal segment. There is also a green form of the larva which has pale spots.

Adult males have mottled light brown or grey forewings with a cream coloured spot near the centre of the wing and on the tip. They have a wingspan of 32-40 mm. Female moths have greyish-brown forewings with markings of grey and brown but do not have the distinctive markings of the male. The female wingspan is 32-40 mm. The hindwings of both males and females are pearlescent-white in colour with a brown border.

Adults are nocturnal, and are most active during warm, humid evenings. Adults can live for between seven and 21 days depending on temperature and climate.

Left: Male fall armyworm adult ©Lyle J. Buss/University of Florida/Bugwood.org CC BY 3.0 US
Right: Female fall armyworm adult ©Lyle J. Buss/University of Florida/Bugwood.org CC BY 3.0 US

Damage

Larvae are nocturnal, being concealed in foliage or at the base of plants during the day. At night they chew on leaves and may also damage flowers and developing seed heads. Young plants may be cut off at ground level.

Larvae prefer to feed on grasses like sorghum and corn but will also feed on a wide variety ofother hosts including apple, papaya, cotton, millet and peanut. Young larvae feed on the epidermis of the leaf. As they mature they begin to chew holes and consume the leaves from the edges inwards.

Mature larvae may defoliate plants giving the leaves a ragged appearance. Excrement (frass) left by larvae will be present. Larvae also feed on the growing tips and fruiting bodies.When food is scarce, mature larvae will move in large numbers like an ‘army’ in search of food.



Left: Larval damage sorghum ©Clemson University/USDA Cooperative Extension Slide Series/Bugwood.org CC BY 3.0 US
Middle: Larval damage to cotton boll ©Ronald Smith/Auburn University/Bugwood.org CC BY 3.0 US
Right: Larval damage in maize whorl ©University of Georgia/Bugwood.org CC BY 3.0 US

If you suspect your property has fall armyworm please call the Exotic Plant Pest Hotline on 1800 084 881.

Control measures are already available for other caterpillars on crops in the NT. These include Integrated Pest Management techniques, based on cultural, biological and chemical control. These should also work on fall armyworm. Details on these can be obtained from Department of Industry, Tourism and Trade (DITT) Entomology on (08) 8999 2258 or email insectinfo@nt.gov.au

All pesticides should be used in accordance with label instructions and the NT Control of Use legislation. For advice on pesticide use contact DITT by email at chemicals@nt.gov.au or phone (08) 8999 2344.

Agnotes or factsheets on other pests are available from the DITT website.

NT Soil Symposium in Katherine

Region: Katherine Region | Topic: Horticulture

Sep 2020 | Danilo Guinto, Research Horticulturist

Territory Natural Resource Management (TNRM) held the final leg of its Northern Territory (NT) Soil Symposiums at Godinymayin Yijard Rivers Arts and Culture Centre in Katherine on 5 March 2020.

More than 35 people attended the Katherine Soil Symposium with duplicate events being held in Alice Springs and Darwin.

Coordinated by Jacob Betros of Territory Natural Resource Management (TNRM), the Soil Symposiums were a workshop focused on recognition of the importance of healthy soil in agricultural and natural ecosystems. Topics such as soil carbon, biology, fertility, soil erosion, climate change, and current initiatives and activities being undertaken nationwide and in the NT to improve soil health and condition were covered.

The symposium speakers consisted of award winning and local speakers Rob Hinrichsen, AUSVEG Grower of the Year 2016,talked about his journey in adopting a number of industry-leading initiatives including a sophisticated composting program, controlled traffic farming, use of biologicals, integrated pest management, and cover cropping.

NT Rural Review – September 2020

Picture 1: The audience viewing the major soil types of the Northern Territory

Colin Seis, 2014 Bob Hawke Landcare Award Winner, talked about the development of his 'Pasture Cropping' technique which has been adopted across Australia and internationally. The method contributes to building topsoil, reducing soil erosion, and provides great potential for restoring grasslands, increasing soil carbon levels, improving soil health and growing nutrient dense, healthy food.

Two local pastoral farmers, Moira Lanzarin from Mataranka and Karen McGrath from Katherine, graduates of TNRM's 2019 Digging Deeper program, shared the learnings and insights they have gained from their training. They believe the key to soil health is the maintenance of ground cover to increase soil organic matter. This increases soil nutrients and water-holding capacity, and the role of cattle plays in nutrient cycling in pastures.

Other speakers at the symposium include Simon Goodhand who talked about the National Soils Strategy: Sue Bestow of the Office of the National Soils Advocate who talked about the Soils for Life program initiated by retired Major General Michael Jeffrey, Angela Hammond of Meat and Lamb Australia who encouraged the audience to get involved in their Profitable Grazing Systems program and Anika Molesworth from Far Western New South Wales, who helped organise Farmers for Climate

Action to connect growers to researchers through her platform called Climate Wise Agriculture in order to build resilience into farming communities.

Jason Hill and Patrick Burly of the Department of Environment, Parks and Water Security (DEPWS) discussed accessing soil information for sustainable land use planning in the Katherine area.

One of the memorable highlights of the symposium was the audience viewing of the major soil types of the NT and the demonstration of how soil samples are collected using DEPWS's hydraulic soil sampling drill.

Above: Patrick Burly of DENR demonstrating the use of their hydraulic soil sampling drill

Pastoral real jobs program (NTCA)

Region: Katherine Region | Topic: Event

Sep 2020

Recruiting for 2021

Northern Territory Cattlemen's Association (NTCA)

Advancing and protecting the interests of cattle producers in the Northern Territory

The NTCA are calling for participants in their Pastoral Real Jobs Program.

The NTCA advances and protects the interests of cattle producers in the Northern Territory (NT).

The program is a local employment program that engages, trains and supports young Aboriginal and Torres Strait Islander people for employment in the NT pastoral industry.

As part of the program, NTCA will

- place participants aged between 18 and 26 years in the NT into employment within the pastoral sector
- recruit and train participants to develop capacity to operate at industry level standards
- engage with key industry employers and match trainees to their employing stations to build strong foundations and connections for a career in the pastoral sector
- provide intensive, multifaceted learning opportunities including workplace and cultural guidance and ongoing mentoring.

More information

For more information or to participate contact:

NTCA
0407 568 451
project.coordinatior@ntca.org.au

Reducing calf loss from exposure – project update

Region: Katherine Region, Barkly Region | Topic: Livestock

Sep 2020 | Kieren McCosker, Senior Livestock Scientist, Katherine

The ‘Reducing calf loss from exposure’ project (besides being a mouthful) has been implemented at Avon Downs station to assess the effectiveness of providing shade for reducing calf mortality in relatively treeless Mitchell grass plains of the Barkly Tableland.

This article presents preliminary results from a pilot study which involved 150 pregnant purebred Wagyu heifers that were predicted to calve between October and December 2019 and were randomly allocated to either a paddock that had one feedlot-grade shade structure (50m x 25m in size) installed within 500m of each water point (SHADE) or not (NO SHADE). Pregnant heifers were put into the trial paddocks for approximately seven months and mustered in April 2020. Heifers observed to be lactating beyond their expected calving date were considered to have successfully weaned a calf.

Above: Picture of the shade structure at Avon Downs station.

The level of calf loss experienced by first-lactation heifers with access to SHADE was comparable to NO SHADE with both groups experiencing approximately 29% calf loss.

Table 1. Summary of calf loss rates observed in pilot study.

	No of heifers	Percent foetal and calf loss (%)	95% Confidence Limits	
			Lower	Upper
Shade	74	28.4 (21/74)	18.5%	43.5%
No Shade	72	29.2 (21/72)	19.0%	44.7%
Overall	146	28.8 (42/146)	20.7%	38.9%

Five heifers from each paddock were fitted with GPS collars. GPS location data were summarised by generating daily counts for each collar of GPS locations within 500m of water and total number of GPS locations recorded over a single day and between 10am and 3pm. Four GPS units were also able to record temperature. The temperature records were summarised by averaging all records for each collar across a single day as well as between 10am and 3pm.

Above: Fitting a GPS collar to a heifer

Table 2. Percentage of GPS locations within 500m of water and collar-recorded temperature per day and between 10am and 3pm.

Treatment	Daily		Between 10am and 3pm	
	Average GPS collar-recorded temperature (°C)	% of daily GPS locations within 500m of water	Average GPS collar-recorded temperature (°C)	% of daily GPS locations within 500m of water
NO SHADE	31.6	35.5	41.2	29.2
SHADE	31.7	35.5	40.6	26.8

These preliminary results appear to indicate that the provision of shade near watering points does not have a large impact on either incidence of calf loss (Table 1), average GPS collar-recorded temperature or time spent near the shade for heifers during summer when considered across an entire day (Table 2). However, when analyses were performed on a subset of data recorded between 10am and 3pm, the daily average collar-recorded temperature for SHADE was 0.5°C lower than for NO SHADE. This is not easily explained as there was no evidence of heifers spending more time resting in the installed shade near water.

What next?

This calf loss research is ongoing; additional collars have recently been deployed and an assessment of the available natural shade in paddocks using satellite imagery is planned.

In late August, with the help of station staff, 214 GPS collars were fitted to the next cohort of pregnant first-calf heifers grazing these trial paddocks. These GPS units will provide data at either 5, 10 or 15 minute intervals with equal numbers of units set to this frequency of fixes.

More information

Check out the FutureBeef project page

Contact:

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