

Alice Springs Rural Review

DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES



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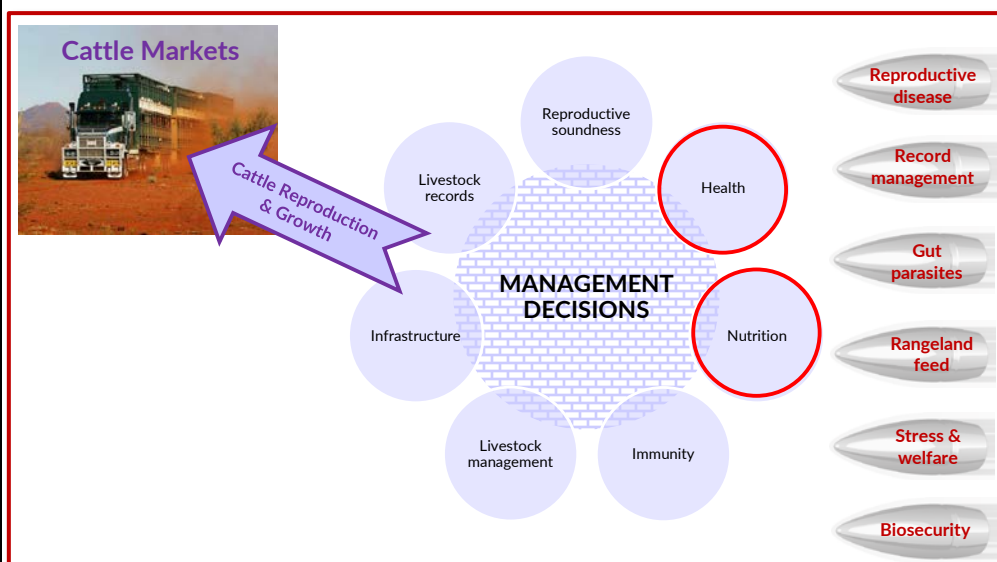
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Recent insights on cattle gut parasites

Jocelyn Coventry, Pastoral Production Officer
Department of Primary Industry and Resources – Alice Springs

Background

Towards the end of last year, August 2017, an animal health day was organised by Landmark – Alice Springs. The day featured speakers presenting over a range of issues for cattle management decisions in pastoral businesses of Central Australia. Figure 1 was presented to attendees to illustrate the complex relationships and why integrated management would be required to address these. For example, cattle health and nutrition are key issues that are negatively affected by cattle gut parasites (intestinal worms and coccidia), however, good cattle health and nutrition are also critical for development of immunity to limit those negative effects.



Continued on page 3

Figure 1. Integration of management decisions is required to optimise reproduction and growth of cattle for markets.

Editorial

It is nearly the end of a long and hot summer; my second in Alice Springs. Having grown up with Tasmanian summers, longing for hot and dry weather, it feels as though my dreams have come true. Thankfully there has been rain in some parts of Central Australia over the summer period, allowing some pasture growth, which can be seen in the feed outlook at the end of this newsletter.

With research stations at Old Man Plains (OMP) and the Arid Zone Research Institute (AZRI), we are familiar with the new technology used to make our lives easier, like remote telemetry to control watering points for cattle, irrigation tanks and bores. Often these are connected through the existing mobile phone network or ultra-high frequency radio. As most of us know, however, lightning strikes, power fluctuations and collapsing solar panels can test the best systems and their operators! It is great that we have skilled operators in town to help out when things don't go right, and without naming them (they know who they are), I would like to acknowledge their importance to both the pastoral and horticultural industries in Central Australia in reducing labour costs and making businesses more profitable through technology.

Breeding is another discipline that has undergone huge leaps and bounds in technology over the last 30 or so years since I went to University, both in plant and animal industries. We recently had our first AZRI harvest of 15 seedless table grape selections developed using Commonwealth Scientific and Industrial Research Organisation (CSIRO) embryo capture technology. Needless to say we had an intensive sampling time over the Christmas and New Year period of some very tasty green, red and black selections of which we hope we can adapt to the growing conditions here. In the animal sphere, our Department of Primary Industry and Resources (DPIR) Droughtmaster herd has received considerable focus over the years, and the high quality genetic material attracts the attention of the local Pastoral industry through the sale of our bulls. Ongoing improvement of our herd will continue to produce a quality animal suited to the conditions of Central Australia.

For those wanting to improve their breeding skills on their own herd, I would strongly recommend the Breeding Edge course advertised within the pages of this newsletter. It could be one of the most profitable courses you will ever attend.

Regards

Stuart Smith
Editor

We are moving!

Due to an extensive program of works at the AZRI complex, which includes asbestos removal, all staff are being temporarily relocated to new offices in town. From Monday 5 March through to October you will find staff from the Department of Primary Industry and Resources Livestock Industry Development, Biosecurity, Administration and the Library on the mezzanine level of Alice Plaza.

Please see page 13 for full details of the move, including dates and contact numbers.

Recent insights from department cattle (cont from page 1)

Records from management of DPIR cattle on AZRI and Old Man Plains Research Station, south of Alice Springs, provides insight into how integrated cattle management activities can limit gut parasites and their negative effects—particularly during routine yard-weaning and in the critical post-weaning period. This will have application to many pastoral properties in the region.

Faecal tests involving counts of intestinal worm eggs and coccidia oocytes per gram of cattle faeces have been used to indicate the presence of infestations. Cattle management associated with nil or low infestations has featured the following:

- **Biosecurity:** Exclusion of last year's calves (this year's yearlings) from breeder cow paddocks helps to limit infestation of the next calf-crop;
- **Good feeding:** Feeding of weaner pellets that contain coccidiostat and protein, together with provision of good quality hay and clean water, supports the health, nutrition and development of immunity in recently-weaned calves;
- **Good handling:** Handling of recently-weaned calves with low stress weaner training helps create a settled, easily-managed group and supports development of their immunity against endemic disease, such as coccidiosis.

Records from the Bureau of Meteorology and OMP also show how seasonal conditions and paddock factors can amplify the risk of intestinal worm disease. Winter of 2016 had a mild start in June with over 25 mm of monthly rainfall and daily temperatures that did not drop below 0°C. This prolonged survival and migration of infective worm larvae, out of cattle faecal pats and up the blades of wet pasture grass. From here the larvae are ingested by grazing cattle and thus increase the herd level of intestinal worm infestation. Over 100 mm of monthly rainfall and fresh growth of grass in early summer of 2016-17 further promoted the cycle of infestation. This was consistent with the high faecal worm egg counts in pre-weaned calves early 2017 (up to 1,840 worm eggs per gram of cattle faeces). On account of these findings, all calves were treated with a broad spectrum anthelmintic during yard weaning, and then released onto fresh feed in the weaning paddock.

Recommendations

Records from DPIR Alice Springs cattle support recommendations for reduction of the post-weaning risks posed by intestinal worm infestations (Figure 2) and coccidia (Figure 3).

GUT PARASITES - Worms
Manage & Treat

- Integrate management
 - allow time to develop immunity
 - high quality nutrition
 - low stress handling
 - avoid exposure to infective larvae
 - fresh feed and water
 - low stocking rates
 - strategic worm treatments

Figure 2. Recommended worm control

GUT PARASITES - Coccidia
Manage & Treat

- Integrate management
 - increase immunity
 - high quality nutrition
 - low stress handling
 - decrease contamination
 - good access to fresh feed
 - feed coccidiostat

Figure 3. Recommended coccidia control

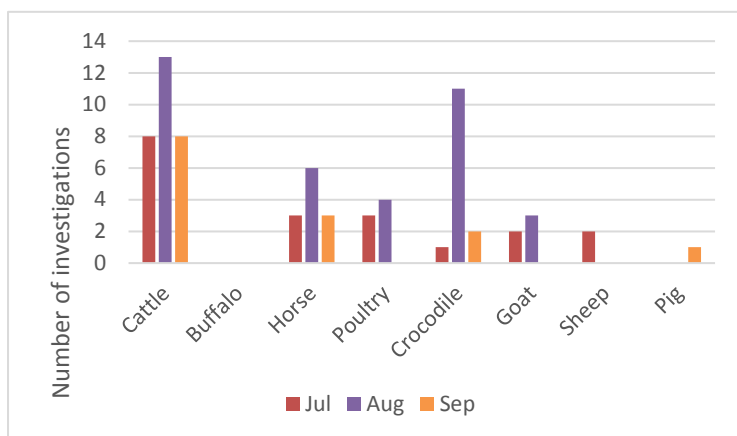
In general, cattle producers are encouraged to confirm the cause of any disease or production loss in their cattle. This can be assisted by faecal testing, firstly to confirm if parasite infestation is an issue, and secondly to help plan strategic treatments. Advice on this is available through regional DPIR offices. It is essential to have a plan for any required treatment of severe clinical gut parasite infestations and, especially for young cattle, a plan that makes good use of the efficiencies achieved with integration of optimal livestock management, infrastructure, nutrition, and immunity.

For more information about these insights, please contact Jocelyn Coventry 08 8951 8142.

Livestock disease investigations

DPIR provides a free disease investigation service to livestock owners for diagnosis of notifiable emergency, exotic and endemic disease, including zoonotic diseases. Berrimah Veterinary Laboratories provide free diagnostic testing for exclusion of notifiable disease for all disease investigations, and subsidies are available to private veterinarians for significant disease investigations in livestock. The Northern Australia Enhanced Disease Surveillance program has been introduced from 2017-2019 on a trial basis providing increased subsidies for cattle and buffalo disease events reported to and investigated by private veterinarians. This program recognises the higher costs and challenges associated with conducting disease investigations in more remote regions.

During July to September 2017, 70 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the Northern Territory (NT). Figure 1 shows the number of investigations by species of livestock.



Berrimah Veterinary Laboratories processed 177 livestock sample submissions, including samples to substantiate proof of disease freedom certifications, for accreditation programs and targeted surveillance to support market access. The following case reports are a selection of disease incident field investigations during the quarter

Figure 1. 4Livestock disease investigations by species for July to September 2017

We are moving.

Biosecurity and Animal Welfare will be located in the mezzanine level of Alice Plaza, Todd Mall from Monday 5 March – October 2018 whilst works are carried out at the AZRI Complex. All contact details remain the same (see page 13).

Foot and mouth disease excluded in salivating cattle in Alice Springs

The manager of a property in the Alice Springs region reported four 2-3 year-old crossbred Hereford steers with signs of weight loss, salivation and loss of muscle/movement control. The steers had been recently



Figure 1. The affected steer was salivating and in respiratory distress.

yarded and were due to be transported for slaughter. Examination of stock by a department veterinarian found affected steers to have the symptoms reported, as well as being in respiratory distress. The most severely affected steer was euthanised for post mortem examination.

Post mortem examination revealed water in the lung tissue and evidence of a healing tongue lesion. While it was suspected that the steer was persistently infected with bovine viral diarrhoea virus, samples were referred to the Australian Animal Health Laboratories (AAHL) to exclude exotic diseases including foot and mouth disease (FMD) and vesicular stomatitis (VS) for the

tongue lesion, and haemorrhagic septicaemia and contagious bovine pleuropneumonia for the lung lesion. Tests excluded all exotic diseases.

Bacteriology culture found moderate growth of a *Pasteurella multocida* from the lung lesion. The diagnosis of the lung lesion was severe pneumonia.

Pasteurella multocida also plays a leading role in the development of bovine respiratory disease (BRD), a condition also known as 'shipping fever'. The condition commonly arises where the causative organism becomes established by secondary infection, following a primary bacterial or viral infection. This usually occurs after stress. In the case of BRD, pasteurellosis is usually preceded by viral infection with either infectious bovine rhinotracheitis (IBR caused by bovine herpes virus type 1), bovine viral diarrhoea virus (BVDV), para-influenza type 3 (PI3) or bovine respiratory syncytial virus (BRSV). The viral inflammation of the respiratory passage initially causes lung lesions and suppresses immunity allowing the bacteria to proliferate. BRD is a major production issue for beef feedlots and dairy.

While the IBR serological blood test results were negative, a positive BVD antigen ELISA blood test and a negative BVDV AGID antibody blood test confirmed the steer was persistently infected (PI) with BVDV. The *P. multocida* bacterial infection combined with the viral BVDV infection led to the BRD syndrome, intensified by the stress of mustering and yarding.

BVDV Type 1 is endemic in the NT cattle population, with most herds and up to 70% of cattle exposed. In-utero infection can result in PI animals which show signs of poor development, ill-thrift and early death. These PI cattle are immune-suppressed and may also develop the more acute and often fatal mucosal disease which presents as severe gastro-intestinal ulceration. Vaccines are commercially available for the main respiratory viruses and bacteria that contribute to BRD, including IBR and BVDV. The vaccines are not widely used in Territory, but should be administered prior to entry into the feedlot and mixing of cattle.

A recommendation was made to cull the remaining three clinically affected steers. There have been no further clinical problems reported from this herd of cattle



Figure 2. Affected steer in poor condition



Figure 3. Other steers from the same group were in excellent condition

Slaughtering, processing and sale of meat in the Northern Territory

The slaughtering, processing and sale of meat for human consumption is regulated under the *NT Meat Industries Act 2011* and associated regulations.

The slaughtering of animals for human consumption has been a common practice on stations over many years, providing meat for owners, managers, employees and guests. It is not an offence to slaughter an animal on your property for consumption by your family and staff, provided it is consumed on the property on which it was slaughtered. The meat must not be sold, bartered, or given away.

The meat may be provided to paying guests in facilities where supplying meat is not the primary source of income e.g. bed and breakfast facilities. Any paying guests must be informed and non-paying guests should be advised that the meat has not undergone an ante mortem or post mortem inspection by a qualified meat inspector.

The sale of station slaughtered meat in a roadhouse or community store situation is considered to be an offence, and is not permitted. All meat used in these operations must be sourced from a licenced processor. The use of station meat houses to process meat for sale is not permitted unless licenced by DPIR.

It has been common practice over many years for stations to supply meat to Aboriginal communities located on cattle stations and this practice is legal and may continue provided the meat does not leave the property of slaughter, is not on-sold, or given to others. This means that where an animal is slaughtered on a station for a local community, the carcass cannot be dressed by community members and removed from the property. If the animal was removed from the property live and transported to the community for slaughter, NT Waybill and National Livestock Identification System regulations would apply.

The supply of meat donated by a company or station to a community event such as a rodeo or campdraft is acceptable, provided that the meat is consumed on the station on which it is slaughtered and not on-sold at the event. If there is an abattoir located near the station it may be beneficial to slaughter the animal through

the abattoir as the standard of meat preparation meets the Australian hygienic meat standards. The station or event co-ordinator should be able to negotiate a service kill in this situation.

All meat sold to the general public for human consumption must be processed in a registered establishment that has been issued with a stamp that has an establishment number. Meat must be inspected by a qualified meat inspector with a minimum Certificate III in Meat Safety.

Further information and advice concerning slaughtering and processing may be obtained from

David Frost
Senior Meat Industry Officer
Telephone: 89992255
Mobile 0401113090

New livestock biosecurity network staff member for northern Australia



Jess Rummery has joined the Livestock Biosecurity Network (LBN) as Manager – Biosecurity and Extension for Northern Australia. She joins LBN fresh from a role with the Australian Department of Agriculture and Water Resources, which focused on live exports. Jess brings a great deal of experience to the department, adding her professional experience to her qualifications in animal science, public administration and national biosecurity policy.

The new role aims to support producers across the Territory and the rest of northern Australia. One of Jess' first responsibilities was to deliver biosecurity planning workshops to producers in Alice Springs, Tennant Creek, Katherine and Darwin throughout September.

Jess is based in Darwin, and is available to speak to producers and provide information on biosecurity planning and the Livestock Producers Assurance (LPA) program.

Jess can be contacted on 0499 077 213 or email jrummery@lbn.org.au

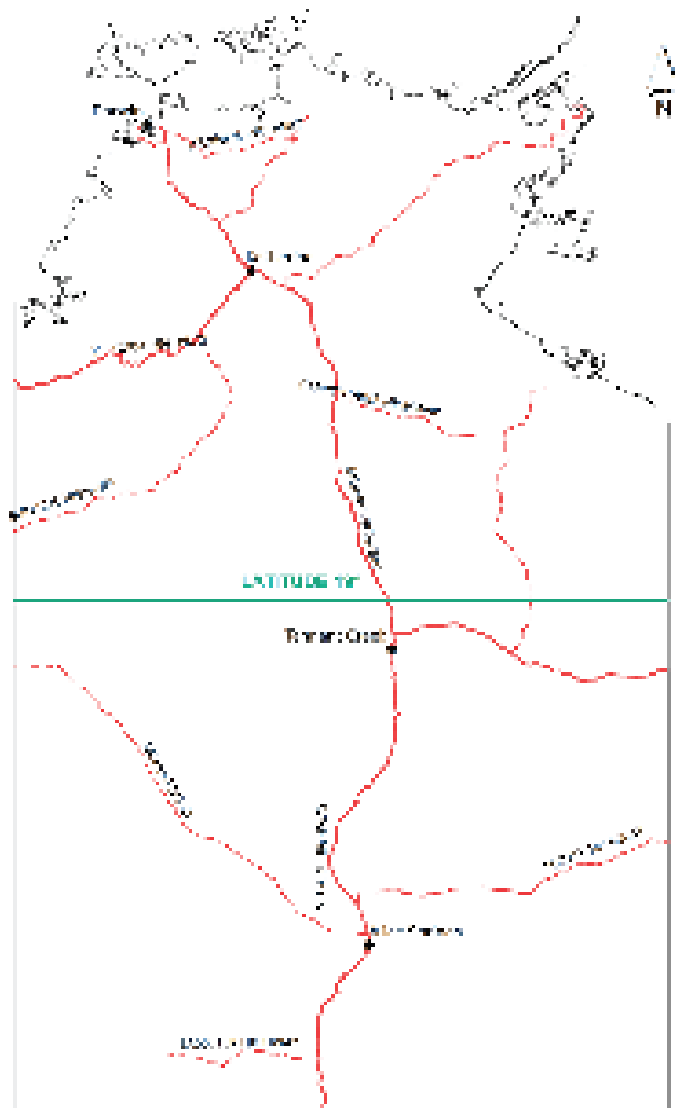


Here to look out for them.

DECLARATION OF A FIRE DANGER AREA AND FIRE DANGER PERIOD

The Executive Director of Bushfires NT, Department of Environment and Natural Resources hereby gives notice that a Fire Danger Period is declared for the period 1 January 2018 to 31 March 2018 in the part of the Territory that lies south of the 19th parallel of south latitude (starting approximately 70kms north of Tennant Creek).

The major effect of this declaration is that, throughout the declared area, a permit to burn is required before any burning is conducted, and a person must not leave an area before thoroughly extinguishing any fire they have lit. There are substantial penalties for failing to comply with these requirements.



For more information contact Bushfires NT on 8922 0844

www.nt.gov.au/bushfires

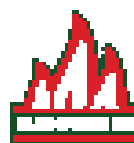


Figure 5 Declaration of a Fire Danger Area and Fire Danger Period

Breeding EDGE Workshop



Alice Springs, NT: 04 - 06 April 2018

VENUE TBA
TIME 8:30am to 5:00pm

BREEDING EDGE IS A THREE-DAY WORKSHOP DESIGNED TO ASSIST PRODUCERS IMPROVE AND REFINE THEIR BREEDER HERD MANAGEMENT AND GENETIC IMPROVEMENT PLANS.

Participants will be able to develop a breeding herd management plan using genetic and reproductive knowledge and technologies, to achieve desired production targets.

Attending this workshop will help you to:

- evaluate and improve your existing breeding herd management program for reproduction and genetic improvement
- understand the importance of measures of reproductive performance
- identify strategies and management to improve breeding herd performance
- develop a management plan that incorporates practical, achievable strategies and a management program to meet your desired objective(s)
- develop systems for evaluating the success of your strategies

Prices:

\$1,750 + GST / One person from a business

\$1,450 + GST / Two or more people from a business

Cost includes comprehensive set of workshop notes, workbook and lunch, morning and afternoon tea each day.

What you will learn:

- reproduction and current herd performance
- female reproduction
- managing the breeders - systems
- bull fertility and management
- reproductive diseases and diseases that impact reproduction
- breeder herd management plan
- genetic improvement of your herd (including breeding objectives)
- traits of economic importance for your herd
- genetic principles and selection tools
- selection and selection criteria
- breeds and breeding systems

Deliverers:

- Felicity Hamlyn-Hill - Beef Enterprise Advisory Services Pty Ltd
- Tim Emery - Tropical Beef Technology Services (TBTS)
- Whitney Dollemore – NT DPIR
- Vet (TBA)

Places are limited. To register contact:

Felicity Hamlyn-Hill

M: 0428 113 732 or

E: felicityhamlyn-hill@bigpond.com



Beef producer feedback needed for animal health monitoring and preparedness study based on farmer-led partnerships

Participation involves the completion of an online questionnaire (around 30 mins) that includes questions on animal health monitoring, preferred communication methods and information sources.

Researchers from Charles Sturt University, Australian Bureau of Agricultural Resource Economics and Sciences and CSIRO are working on this study as part of a Rural Research and Development for Profit project* aimed at improving surveillance, preparedness and return to trade from emergency animal disease incursions using Foot and Mouth disease as a model.

You will not be identified in any reports produced and will have the opportunity to go into a prize draw to win a \$50.00 retail gift voucher.

[Click here](#) to complete the survey, or type the following address in your browser:

<https://www.surveymonkey.com/r/Cattle02>

*This project is supported by Meat & Livestock Australia (MLA), through funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit programme, and by producer levies from Australian FMD-susceptible livestock (cattle, sheep, goats and pigs) industries and Charles Sturt University, leveraging significant in-kind support from the research partners.

The research partners for this project are the Commonwealth Science and Industrial Research Organisation (CSIRO), Charles Sturt University (CSU), the Bureau of Meteorology (BOM) and the Australian Department of Agriculture and Water Resources, supported by Animal Health Australia (AHA).

Developing Tennant Creek and the Barkly Region

While most of the Barkly pastoral people were at Brunette Downs for the Landcare Field Day, there were miners, business people and agriculturalists who stayed behind in Tennant Creek for the Barkly Regional Resources and Economic Development Conference at the Civic Centre on Tuesday 24 and Wednesday 25 October 2017.

Mike Fawcett, from the department's Legacy Mines Unit gave an overview of the \$1.8 million that has been spent to address safety, sacred site and environmental issues surrounding public access to historic mine sites in the region. Stuart Ord from the Department of Tourism and Culture is working on opportunities for some of these sites to be linked into tourist trails.



Figure 1. Barkly House Tennant Creek.

Dr Ian Scrimgeour Executive Director of the Northern Territory Geological Survey (NTGS) also spoke at the conference, telling delegates about the work NTGS continues to do under the Creating Opportunities for Resource Exploration (CORE) initiative to help attract exploration investment to the Territory. This includes work with Geoscience Australia to identify mineral deposits in the area between Tennant Creek and Mount Isa, of which there appears to be many hidden beneath the surface.

Stuart Smith, from the Alice Springs Office, in conjunction with Jason Hill, Director Land Assessment Branch of Department of Environment and Natural Resources presented on the recent soil surveys around Tennant Creek and the historic cropping trials and current plant based industries in the region such as melons, hay and onions.

The conference was also an opportunity to showcase Tennant Creek's ongoing development as the Territory's resources services hub, which has been given a recent boost with the opening of the Edna Beryl Gold Mine and construction beginning on Jemena's Northern Gas Pipeline. The pipe stockpile in Tennant Creek for this pipeline is the largest in Australia, and they are managing to lay five kilometers of pipe a day. Other projects like phosphate mining on Murray Downs were also discussed.

Tom Ryan from Northern Territory Cattleman's Association gave a great overview of the local cattle industry. He said that Australia is the largest beef *exporter* in the world, but is a relatively small producer. Its markets in order of size are: Japan, Korea, USA and Indonesia. Pork and Poultry are the biggest protein sources in South East Asia, but beef is getting bigger and presents a great opportunity.

Australia is also a high cost producer, costing \$350 per beast to process, while it is only \$180 per beast in the United States of America, with other countries like Brazil and India processing even cheaper than this, but the market loves the Australian 'story' and its history of product integrity.

He also evaluated the impact of the Livingstone Abattoir near Darwin on industry, saying it has allowed herd improvement by creating a market to cull aged animals.

For the Barkly, he said the region has more 'flatback' (non - Brahman) cattle than it did in the past, and now has the largest Wagyu herd in Australia. He emphasised water as a key to growth - the more it is reticulated, the more pasture can be utilised. An estimate was given that cattle are only grazing 50% of pastures at present.

Other opportunities mentioned were hay and fodder production, including the use of legumes to increase the amount of protein in the diet of local animals.

The conference was supported with speeches from politicians Steve Edgington (Mayor, Barkly Regional Council), Minister Ken Vowles and Minister Gerry McCarthy, who all gave their vision for the region.

Overall the conference gave an excellent overview of the developing resource and agricultural industries in the region, which can only be good for overall economic development in the Barkly.

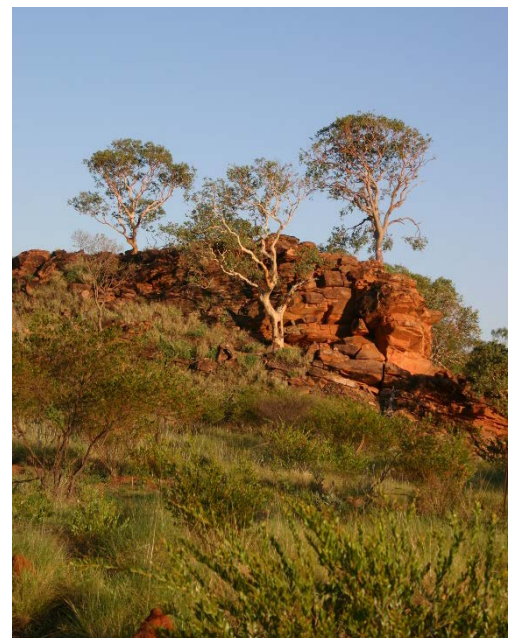


Figure 2. Barkly Tablelands

As part of a wider Australian Government initiative to boost economic development in northern Australia, Geoscience Australia (GA) is leading the *Exploring for the Future* program in collaboration with State and Territory partners such as the Northern Territory Geological Survey to acquire data and build our knowledge of mineral, energy, and groundwater resources across the NT.

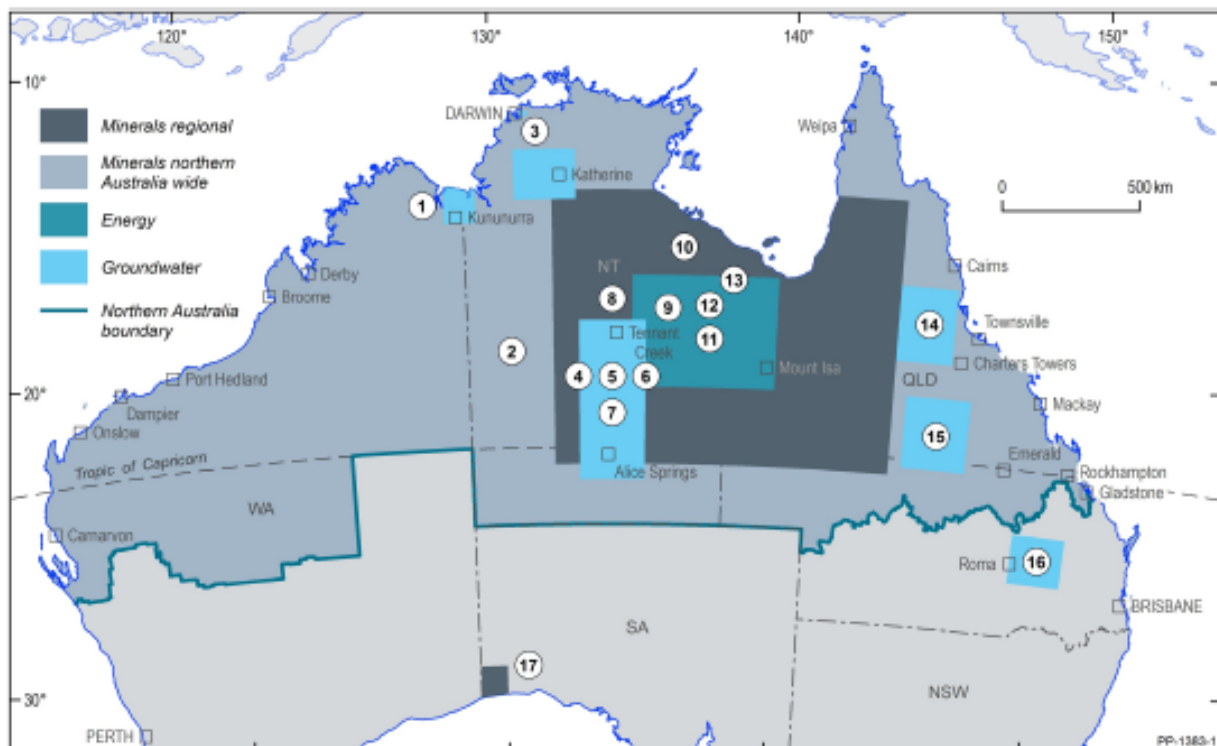
Between 2017 and 2020 several geoscience research projects will be working across northern Australia including:

- Airborne electromagnetic surveys
- Bore water testing
- Borehole logging and hydraulic testing
- Soil geochemistry
- Magnetotelluric surveys
- Seismic surveys
- Stratigraphic drilling

The information collected from these surveys will be publicly available via the GA website.

Further information about Exploring for the Future can be found at www.ga.gov.au/efft and enquiries can be made to efft@ga.gov.au or 1800 870 833 (Mon-Fri, 9am to 5pm AEST).

An overview of current *Exploring for the Future* activities



- | | | |
|--|--|--|
| ① AEM survey, East Kimberley | ⑦ Southern Stuart Corridor AEM survey | ⑬ North Australia geochemistry survey |
| ② Solid geology map | ⑧ Hydrogeochemistry sampling, Tennant Creek | ⑭ Bore hole monitoring, Upper Burdekin |
| ③ AEM survey, Northern Stuart Corridor | ⑨ AusLAMP survey | ⑮ AEM survey, Galilee Basin |
| ④ AusAEM survey, Mt Isa to Tennant Creek | ⑩ Hydrogeochemistry sampling, McArthur Basin | ⑯ AEM survey, Surat Basin |
| ⑤ Onshore drilling assessment, Mt Isa to Tennant Creek | ⑪ South Nicholson gravity survey | ⑰ Coompana drilling program |
| ⑥ AusARRAY survey, Mt Isa to Tennant Creek | ⑫ South Nicholson seismic survey | |

Arid Zone Research Institute (AZRI) temporary relocations

Arid Zone Research Institute (AZRI) staff and services will commence temporary relocations during February and March to support asbestos removal, carpet replacement and air conditioner works on site at AZRI.

Due to the age of many buildings and facilities in the Northern Territory, building materials containing asbestos are present in many locations. Asbestos is not dangerous unless crumbled to release the fibres.

Asbestos removal has been approved for buildings at AZRI, in line with the Northern Territory Government policy to remove all asbestos from government buildings.

To facilitate the safe removal of the asbestos, all staff in affected buildings will temporarily relocate while the asbestos removal takes place. Carpet replacement will commence once asbestos removal is finished. Concurrently, a new energy efficient air conditioning system will be built and installed. It is anticipated that the temporary locations will remain in place until Spring 2018.

There will be no interruption to online library resources with library staff available to help with literature searches and document delivery from external sources. During the works period access to print material and serial collections will be limited however, resources can be sourced and borrowed from other libraries if needed.

The Library Services team are available to help find a solution during the interim so please contact them directly to discuss your needs.

Below you will find information on where you can find AZRI staff and services.

For more information phone 8951 8102 or email susan.turner@nt.gov.au

Water Laboratory Phone: (08) 8951 8110 Email: Cinzia.rovida@nt.gov.au	Relocating: Monday 26 February 2018 House 1 Arid Zone Research Institute, 519 South Stuart Highway Alice Springs All services will continue to be available
Farm managers and staff Phone: 08 89518111 Email: Debbie.roberts@nt.gov.au	Relocating: Monday 26 February 2018 AZRI and Old Man Plains staff Will remain on AZRI but will be housed at the Farm Office, near the farm sheds.
Northern Territory Geological Survey and Mining Compliance teams Phone: 0889518111 Email: Susan.turner@nt.gov.au	Relocating: Monday 5 March 2018 Anangu House - Level 1, 44 Bath Street Alice Springs

**Regional Management Services
Plant Industry Development
Livestock Industry Development
Biosecurity and Animal Welfare
Bushfood Officer**

Phone: 0889518111

Email: Susan.turner@nt.gov.au

Relocating: Monday 5 March 2018

ALICE PLAZA- Tenancy 2 Mezzanine Floor, Todd
Mall Alice Springs



Goodbye asbestos. AZRI main offices, Alice Springs

Limiting spray drift and improving coverage

Callen Thompson, Former Senior Extension Agronomist Katherine

Agriculture in the Northern Territory is famous for its vast cattle stations but within this landscape horticulture and forages are often concentrated where there are lifestyle blocks. This creates a risk of spray drift if chemicals are not applied properly.

Spraying is part of most agricultural systems and Australian Government regulations ensure that chemicals are safe for use as long as the applicator follows the label directions.

By understanding weather conditions, spray equipment and the product, spray efficiency can be maximised.

Coverage

It is important to adequately cover the spray target. Chemical that does not land on the target is wasted. This effectively reduces the rate of product, reducing efficacy and encouraging chemical resistance.

Translocated products, (e.g. glyphosate) move through the plant so coverage is not as important as non-translocated products like gramoxone.

Pre-emergent products like S-Metolachlor need good coverage as they act as a film on the soil surface to prevent weed emergence. Coverage can be affected by spray timing, product solubility and ground cover.

Droplet size

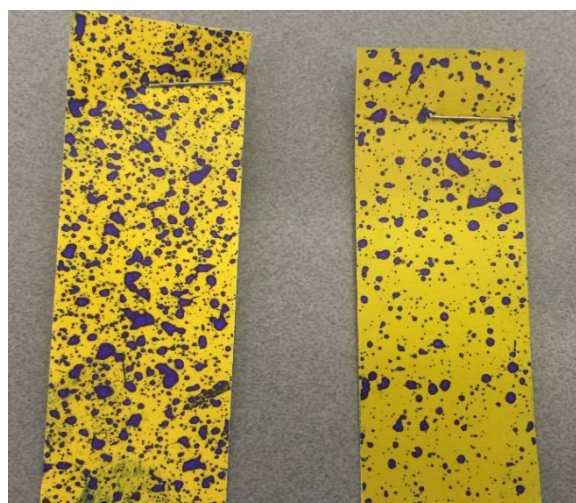


Figure 6. 100 L/ha of water on the left vs 50 L/ha of water on the right. Both very coarse droplets.

Different nozzles deliver various droplet size ranging from very fine to extremely coarse. Fine droplets are small, slow moving and highly susceptible to drift while coarse droplets are large, fast moving and less susceptible to drift.

If landing on the desired target, fine and medium droplets will give a more even coverage compared to coarse droplets, however, weather conditions and equipment setup can decrease fine droplet survival and increase movement off target. Good coverage can be achieved using coarse droplets if the water rate is increased. Figure 1 shows water sensitive paper comparing two spray rates, 100 and 50 L/ha using air induction nozzles giving coarse droplets. The higher water rate achieved far greater coverage.

Key points:

- Weather, nozzles and boom height can effect spray drift and coverage.
- Drift is reduced by using coarse droplets, but coverage is decreased.
- Increasing water rate will increase coverage.



Weather conditions affecting application

Weather in the Northern Territory is generally marginal for spraying. It is important we understand how weather effects spray quality and how we can manage it.

Wind

Wind causes physical drift of droplets. Avoid spraying when wind is blowing towards non-target crops or important environmental assets. Risk of drift can be reduced by using coarse droplets because larger, heavier droplets have greater velocity and are less susceptible to being blown off target. Spray when wind speed is between 3-20km/h and is not gusting (some products like 2-4, D label requires less than 15km/h). Never spray when there is little to no wind (less than 3km/h) as this can allow fine droplets to float upwards into an inversion layer (see below). If possible, measure wind speeds at boom height.

Temperature

Weeds are not likely to translocate product at high temperatures so avoid spraying in these conditions. In addition, high temperatures can cause volatile chemicals to vaporise and lift of the target (vapour drift). This can happen hours after the chemical has been applied. Chemical companies recommend spraying below 30°C.

High temperature combined with low humidity can effect droplet survival due to evaporation. Use of coarser/larger droplets will decrease the effect of evaporation. Because of this relationship, understanding Delta T (or ΔT) is very important.

Humidity and Delta T

Increased humidity can reduce droplet evaporation rate. The relationship between temperature and humidity is expressed by delta T, which is the measure of the difference between wet and dry bulb temperatures (delta is the mathematical term for difference, T for temperature). High delta T (high temperature/low humidity) causes droplet evaporation and can limit the product hitting the target. Low delta T (low temperature/high humidity) can enhance drift as fine droplets survive longer. The graph in figure 2 is a great tool to determine the right Delta T conditions for spraying. Delta T between 2 and 8 is ideal.

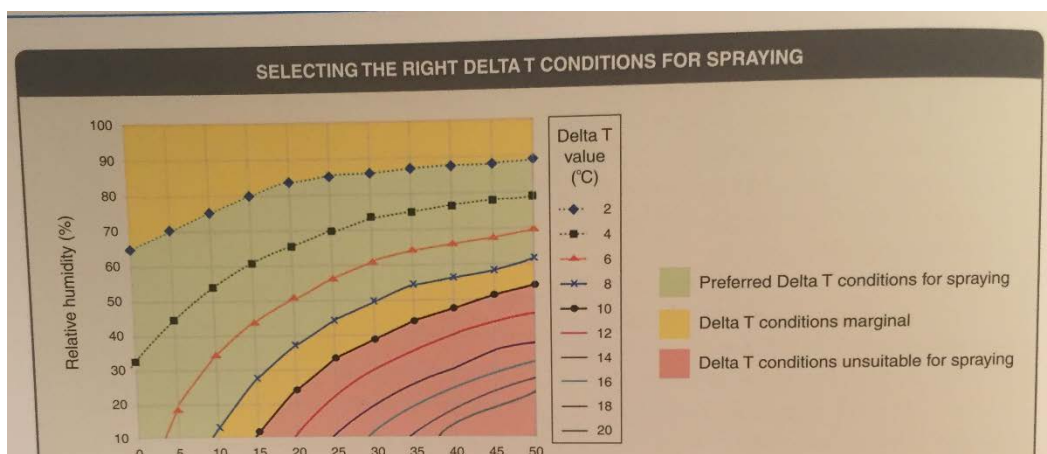


Figure 2: Selecting the right Delta T conditions for spraying. Source: Jorg Kitt, 2008. *Spraywise Broadacre Application Handbook*.

Surface temperature inversion

A surface temperature inversion is commonly known as an inversion layer, and has the potential to cause chemical drift up to 30km from the area sprayed.

Under normal conditions temperature decreases with altitude. In an inversion event, temperature increases with altitude. The cool air close to the ground doesn't mix with the warm air and layers are formed. Fine droplets or vapour can be trapped in these layers and drift.

This often happens when there is low wind, high daytime temperatures and low night temperatures. Inversion layers usually occur between early evening and early morning. Dust, smoke and fog can indicate an inversion layer.

Using spray equipment to limit drift and maximise coverage

Weather conditions in the NT can be detrimental to achieving good spray outcomes. There are ways to maximise spray efficiency by spray rig setup and selecting appropriate nozzles.

Boom Height

It is important to set a boom high enough for overlap of nozzle fans but not too high to increase drift. Figure 3 shows that 110 degree flat fan nozzles should be 50cm from the target. Grains Research and Development Corporation data suggests that raising a boom from 50cm to 75cm increases drift potential fourfold. This risk can be managed by using nozzles that deliver large droplets. This will also improve coverage as larger droplets will have greater velocity and will penetrate a crop canopy.



Speed



Figure 3. Selecting boom height when there is a false target.

Increasing speed reduces the time it takes to spray a paddock, which is beneficial when utilising positive weather conditions. Unfortunately, increasing speed can lead to wind shear and eddies, which creates increased fine droplets. Increased speed without increasing water rate can decrease coverage, particularly with a standing target.




Water rate

Increasing water rate is the easiest way to increase coverage. If coarse droplets are used for drift reduction, increasing water rate will reduce poor coverage associated with large droplets. Water rate can be increased without decreasing speed, provided the correct nozzle is used.

Nozzle selection

There are many different nozzles but for broadacre boom spraying, the main groups used are Conventional flat fan nozzles, pre-orifice flat fan nozzles and air induction nozzles. Characteristics of these nozzles can be seen in Table 1.

Table 1: Characteristics of commonly used nozzles (photo credit: TeeJet)

Conventional nozzles	Pre-orifice flat fan nozzles	Air induction nozzles
-single orifice -produce large amount of fines	-pre-orifice and an exit orifice -drift reduced by 50% -Fine to coarse, depending on pressure	-Low pressure variants can produce a medium droplet -Droplets are generally coarse to extremely coarse
		

Conventional flat fan nozzles produce droplets when liquid under pressure is forced through a small hole or orifice.

Pre-orifice nozzles control flow and restrict the amount of liquid which decreases internal pressure. This leads to larger droplets.

Air induction nozzles contain a venturi which draws air bubbles into the liquid stream. The droplets exiting the nozzle are generally coarse to very coarse and filled with air. This creates a cushioning effect when they hit the plant so they don't bounce off, which can happen with large droplets from conventional nozzles.

Colours of the nozzle represent its size of the nozzle. The larger the nozzle, the more water volume sprayed. All nozzle manufacturers have charts to identify their nozzles. A nozzle chart allows the user to pick the appropriate nozzle for the water rate, speed and pressure they want to use.



Application technology workshops

Department officers and NT Farmers identified the need for greater training in application technology and applied for funding from Federal Government's National Landcare programme promoting sustainable agriculture. This funding was used to run training workshops at Douglas Daly, Katherine and Darwin. A YouTube video was also produced to demonstrate nozzle selection. Click the link below to watch.

<https://www.youtube.com/watch?v=WmOnlcMyZGc>



SnapCard

SnapCard is an app that gives spray applicators the ability to assess the coverage they are achieving with their spray rig. Applicators can place water sensitive paper (available from rural retailers) on their target, be it a crop, weed or a grape leaf. They then spray the target and come back to collect the water sensitive paper. The applicator can then use the app to assess the percentage of coverage.

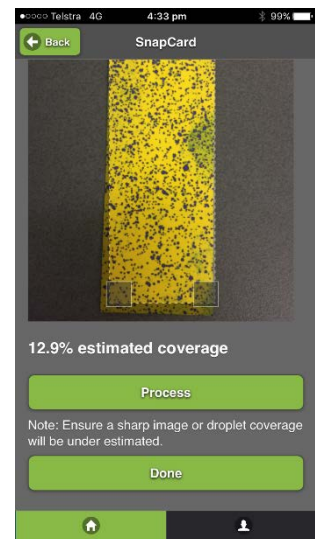
The user can compare different sprayrig settings to assess what is giving the best results for their current environmental conditions.

The app was developed by the Department of Agriculture and Food, Western Australia, and the University of WA's (UWA) applied entomology program. This was supported by funding from the Council of Grain Grower Organisations and the GRDC.

For more information go to: <https://grdc.com.au/resources-and-publications/groundcover/ground-cover-supplements/ground-cover-issue-122-spray-application/app-provides-snappy-spray-assessment>

DPIR has a great YouTube video demonstrating how to use water sensitive paper:

<https://www.youtube.com/watch?v=WmOnlcMyZGc>



Seasonal Update - March 2018

Chris Materne, Pastoral Production, Alice Springs



Weak La Niña predicted to end in autumn!

The La Niña in the tropical Pacific Ocean continues to decline. This weak event has had little effect on Australian climate and is expected to decay by early autumn. The Indian Ocean Dipole (IOD) is currently neutral. In addition to the natural drivers such as the El Niño–Southern Oscillation and the Indian Ocean Dipole, Australian climate patterns are being influenced by the long-term increasing trend in global air and ocean temperatures.

The national outlook for March to May 2018 indicates that:

- **DRIER** than average conditions are expected across central Australia
- **HOTTER** daily and nightly temperature are expected across central Australia

For further information go to: <http://www.bom.gov.au/climate/outlooks/>

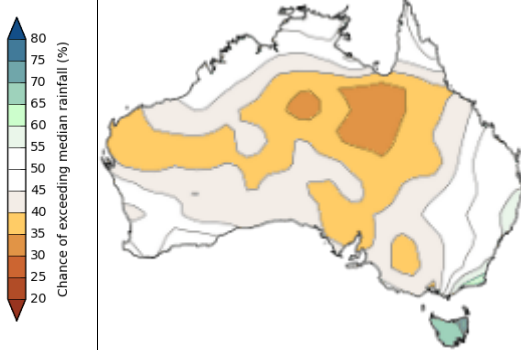


Figure 1: Chance of above the median rainfall. (March to May 2018)

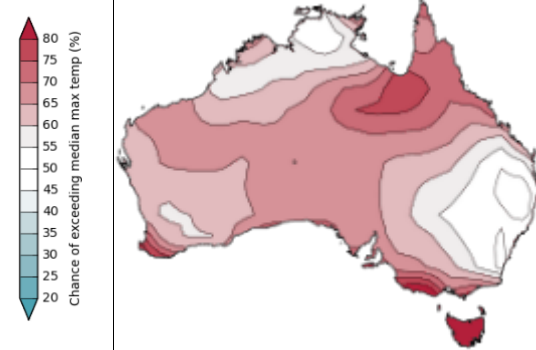


Figure 2: Chance of above the median maximum temperature. (March to May 2018)

Northern Territory Pastoral Districts

Indicator	Southern Alice Springs	Plenty	Northern Alice Springs	Tennant Creek	Comments
2017/18 Total pasture growth	↓	↓	↓	↔	Arrows indicate trend compared to the long-term median.
Current estimated standing biomass	↓	↓	↔	↔	Arrows indicated trend since previous quarter.
Current fire risk	↓	↓	↓	↔	Arrows indicate the trend since the previous quarter.
Current seasonal outlook	↓	↓	↓	↓	Arrows indicate the trend since previous quarter and consider forecasted model predictions.

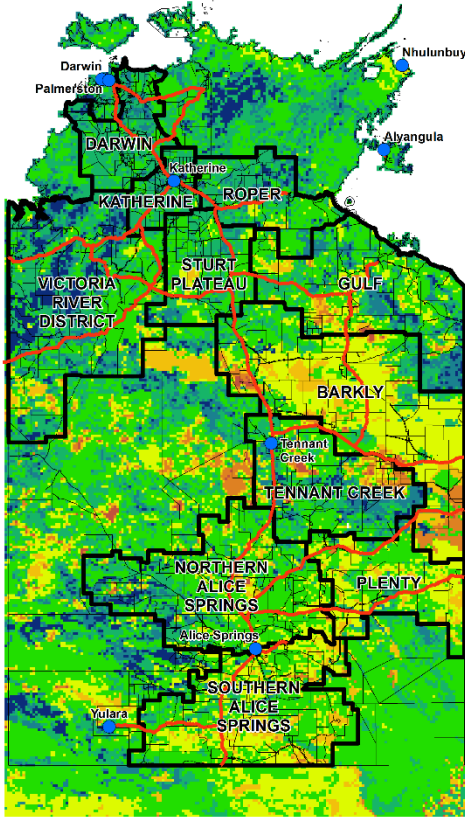
Legend:

Increasing Trend = ↑
 Decreasing Trend = ↓
 Steady = ↔

Green = low risk
 Orange = watch
 Red = high risk

AussieGRASS - March 2018

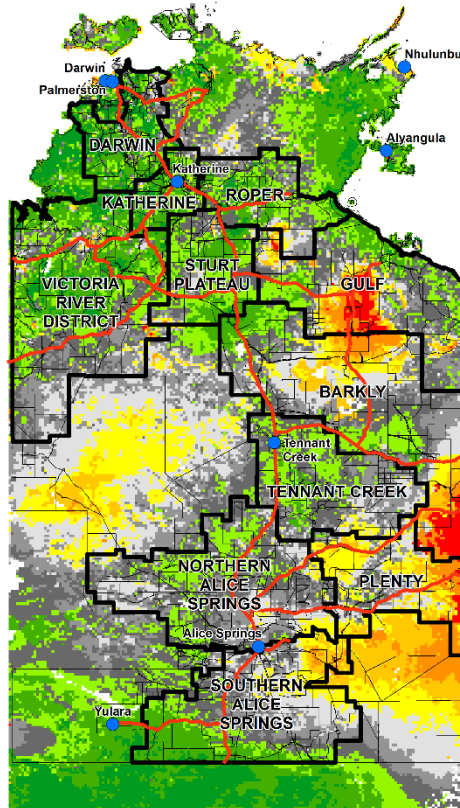
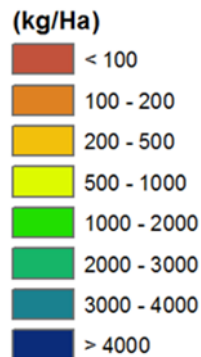
Chris Materne, Pastoral Production, Alice Springs



Current Total Dry Standing Matter

(as of Thursday 1 February 2018)

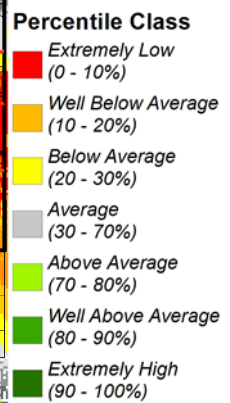
Legend



Past 6 Months Pasture Growth

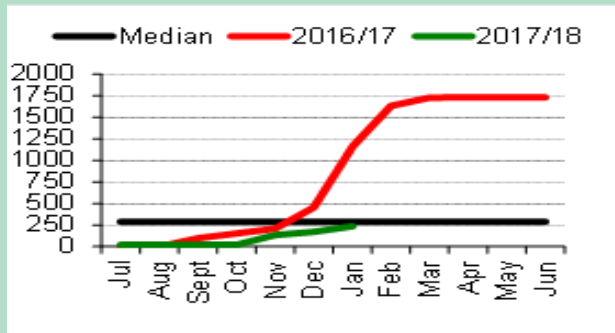
relative to historical growth since 1957
(as of Thursday 1 February 2018)

Legend

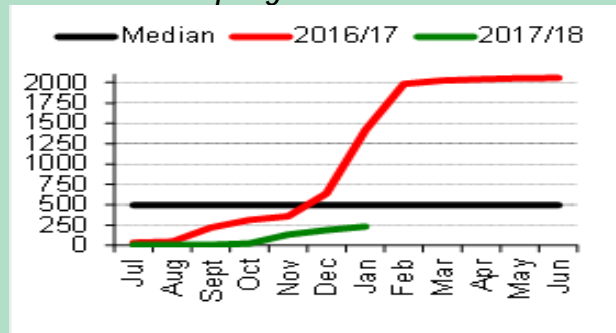


Median district pasture growth (kg/ha) — running total

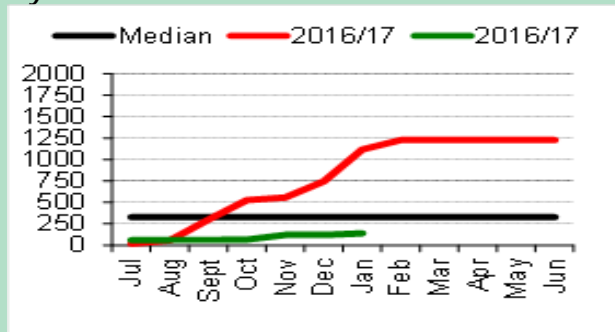
Tennant Creek District



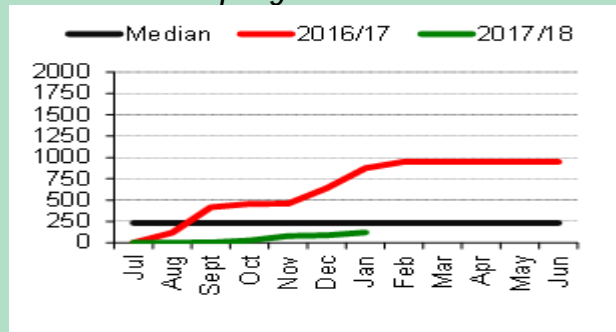
Northern Alice Springs District



Plenty District



Southern Alice Springs District



If you would like further information, please contact Chris on 8951 8111

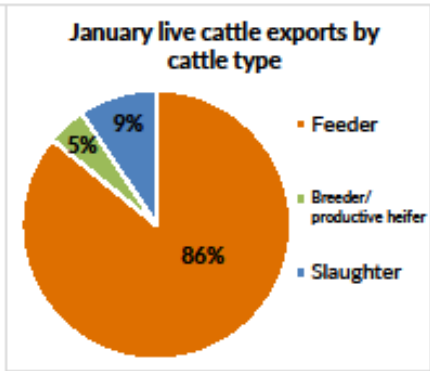
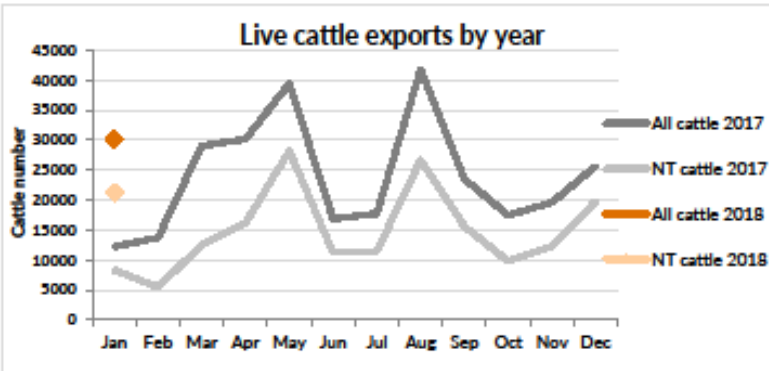


Live Exports via Darwin Port – JANUARY 2018

Please note: figures are for stock exported through the Port of Darwin only; some NT stock are exported through interstate ports

CATTLE

Destination	Export of ALL CATTLE (including interstate)							Export of NT CATTLE (estimate only)						
	2016	2017	Last year to 31/01/17	YTD to 31/01/18	Jan	Last month	Difference	2016	2017	Last year to 31/01/17	YTD to 31/01/18	Jan	Last month	Difference
Brunei	3,379	2,793	0	0	0	0	0	2,314	1,701	0	0	0	0	0
Indonesia	296,230	226,304	11,067	27,364	27,364	19,775	7,589	195,037	138,912	7,537	19,264	19,264	15,266	3,998
Philippines	4,697	0	0	0	0	0	0	3,236	0	0	0	0	0	0
Sabah	0	2,640	0	0	0	0	0	0	1,680	0	0	0	0	0
Sarawak	1,220	2,138	0	0	0	0	0	843	1,189	0	0	0	0	0
Malaysia	10,959	12,557	0	0	0	0	0	7,476	7,671	0	0	0	0	0
Vietnam	36,405	39,989	1,127	2,830	2,830	5,904	-3,074	24,783	25,884	767	1,992	1,992	4,558	-2,566
Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thailand	0	800	0	0	0	0	0	0	535	0	0	0	0	0
Cambodia	2,766	0	0	0	0	0	0	1,936	0	0	0	0	0	0
TOTAL	355,656	287,221	12,194	30,194	30,194	25,679	4,515	235,625	177,574	8,304	21,257	21,257	19,824	1,432



OTHER LIVESTOCK

Destination	Buffalo		Goat		Camel	
	YTD	Jan	YTD	Jan	YTD	Jan
Brunei	0	0	0	0	0	0
Indonesia	0	0	0	0	0	0
Philippines	0	0	0	0	0	0
Sabah	0	0	0	0	0	0
Sarawak	0	0	0	0	0	0
Malaysia	0	0	0	0	0	0
Vietnam	0	0	0	0	0	0
Egypt	0	0	0	0	0	0
Thailand	0	0	0	0	0	0
Cambodia	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0

CATTLE MOVED FROM NT TO INTERSTATE

Destination	Jan	YTD as at 8/02/2018
NSW	264	264
QLD	658	658
SA	495	495
VIC	281	281
WA	0	0
Total	1,698	1,698

NATIONAL CATTLE PRICES

www.mla.com.au/prices-and-markets

CURRENCY EXCHANGE RATES

www.panda.com/currency/converter

Total of ALL CATTLE through Port of Darwin							Total of NT CATTLE through Port of Darwin						
2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017
269,617	246,990	359,616	493,958	487,568	355,656	287,221	253,797	234,249	308,784	324,477	287,892	235,625	177,574

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