Katherine Rural Review

DEPARTMENT OF **PRIMARY INDUSTRY AND RESOURCES**

EDITION #338
March 2019

Inside this issue:

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ISSN 0394-9823

Message from the Editor

Welcome to edition #338 of the Katherine Rural Review, the first edition for 2019.

The beginning of 2019 has been a busy one for DPIR with the organisation of two upcoming field days. These field days will be held at Katherine Research Station on Tuesday 9 April and at the Douglas Daly Research Farm on the Wednesday 10 April. You can find more information about these jam packed days and how to register on page 2.

While our eastern neighbours copped a lashing with rain and subsequent flooding in February, the Northern Territory (NT) recorded some less than stellar rainfall totals. With this in mind it is a good idea to assess your individual situation, consider your management options and act early. Check out the article with the run down on the March Pasture Feed Outlook for the Roper, Sturt Plateau, Victoria River District and Katherine Districts on pages 6 & 7. With that in mind it may also be worth refreshing the memory about early weaning in drought conditions on page 3. You can also read about what drought support is available to NT landholders on page 8.

The 18 June will see the annual DPIR bull sales with quality Brahman and composite bulls up for grabs. You can read about what impact the bull you choose today has on your future herd on page 9 & 10. You will also find details about the bull sale on page 10.

There are also updates on a weaner phosphorus trial, the wild dog management project and what has been happening at the Katherine Research Station. We introduce you to the new Senior Extension Agronomist, highlight some key learnings from a recent savanna fire forum and let you know about many of the upcoming learning opportunities being run in your region.

Settle in with a cuppa and catch up on all the latest news, information and events happening around the Katherine region.

Cheers,
The Editor

ISSN: 1325-9539

NORTHERN TERRITORY GOVERNMENT

Field Day Information

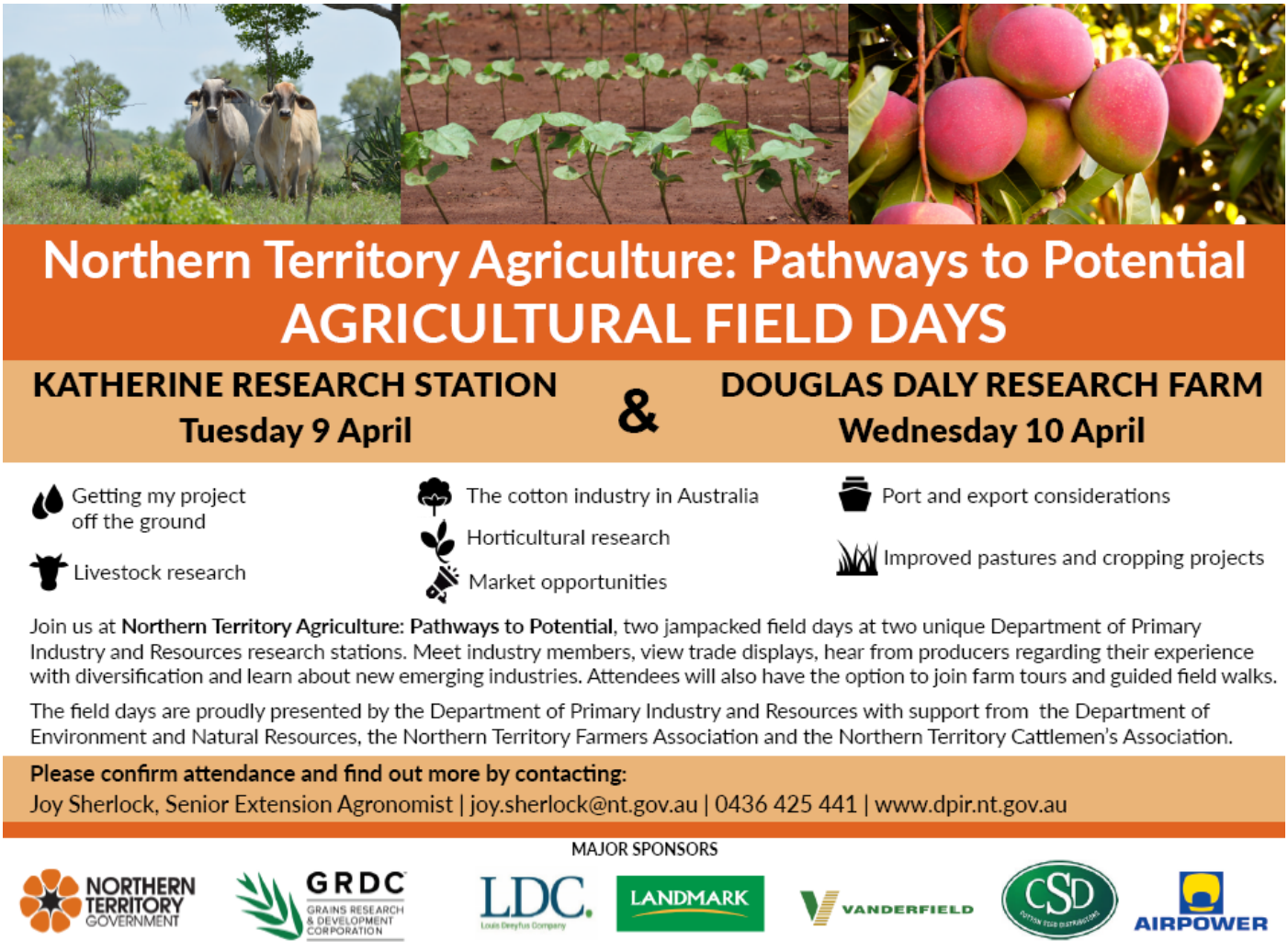
The department is hosting two agricultural field days at Katherine Research Station on Tuesday 9 April 2019 and Douglas Daly Research Farm on Wednesday 10 April 2019.

The field days will have a strong focus on the NT industry development, and highlight the potential of diversified farming systems. Industry stakeholders are invited to attend.

Attendees will have the opportunity to:

- Attend presentations from government and industry representatives
- Network with industry members
- View trade displays
- Undertake field walks at the DPIR research farms.

The field days are presented by DPIR with support from the Department of Environment and Natural Resources, the Northern Territory Farmers Association and the Northern Territory Cattlemen's Association. Visit the department website to see the programs.[1]



[1] https://dpir.nt.gov.au/primary-industry/agricultural-field-days

Early weaning in drought conditions

Tim Schatz, Principal Livestock Research Officer, DPIR Darwin

Many parts of the NT have had disappointingly low rainfall totals over the 2018/19 wet season so far. In fact graphs from the CliMate application show that many properties are on track to have one of their worst wet seasons in the last 50 years. The graphs printed below show how the current wet season (the red line) compares to previous wet seasons and the average (the dark blue line) over the last 50 years for three locations.

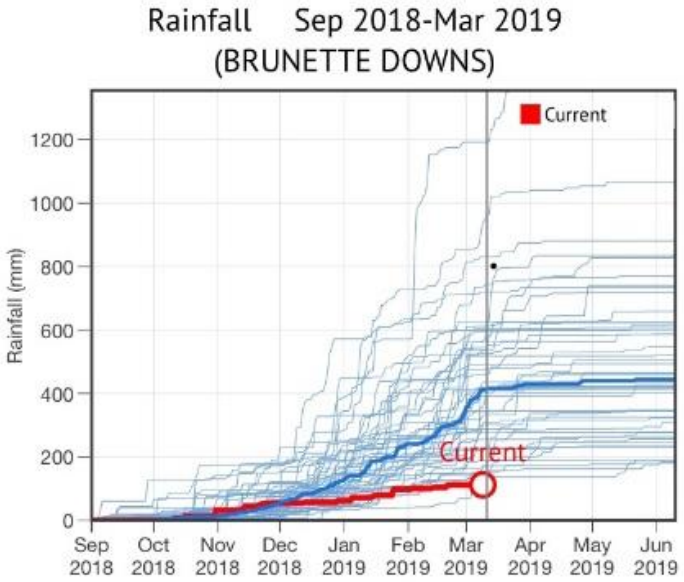


Figure 1a. Current season, red line, at Brunette Downs. (Source: CliMate app)

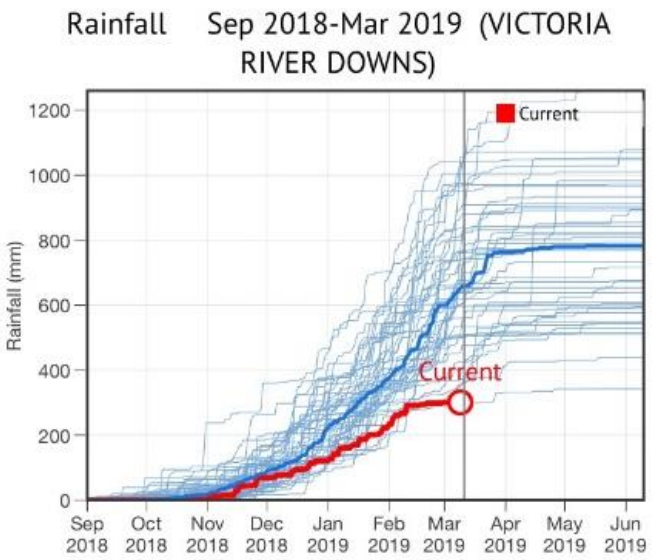


Figure 1b. Current season, red line at Victoria River Downs. (Source: CliMate app)

During tough years when there is not much pasture available for cattle it is often a good management practice to start weaning calves earlier than normal to reduce the nutritional demands on cows. When cows are lactating, a lot of nutrients leave their body in the milk. When they don't get enough nutrients from the pasture, they mobilise nutrients from their own body reserves to produce milk and as a result lose body condition. When this happens over an extended time they can become so poor that they stop cycling (resulting in low pregnancy rates) and can even be at risk of dying. This is especially the case in first lactation heifers and so they should be the first group weaned.

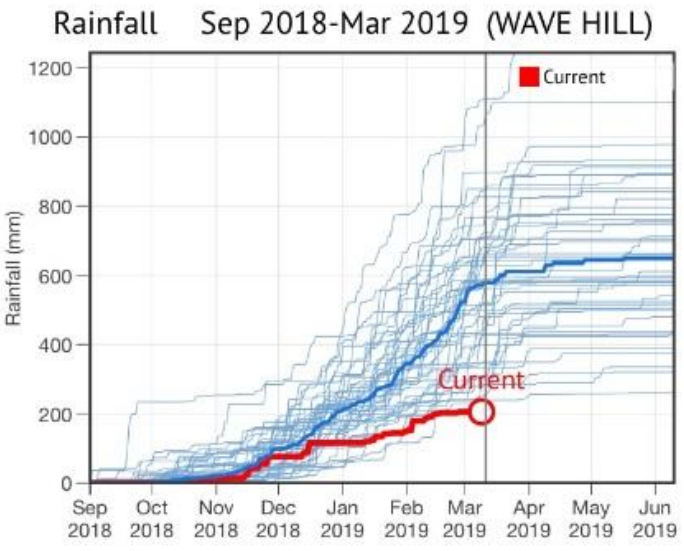


Figure 1c. Current season, red line, at Wave Hill. (Source: CliMate app)

Weaning calves removes this nutrient drain and preserves the body condition of cows. It has been said that weaning a calf is equivalent to giving a cow a supplement of 2 kg of grain or 3 kg of fortified molasses every day. However, it is cheaper and easier to wean and feed calves than to supplementary feed cows with calves at foot for survival, particularly when not all cows in the mob require feeding (e.g. dry cows in reasonable condition).

While early weaning preserves the body condition of cows, some of the calves will need extra management if they are very young when weaned. Research in the NT has found that calves that are heavier than 100 kg at weaning do not require special supplementation provided they have access to good pasture. However calves that are lighter than 100 kg at weaning should receive some extra supplementation. In crisis situations calves can be weaned quite young (eg. down to 60 kg) however they will require special nutritional management and supplementary feeding. Calves weighing between 60-100 kg at weaning should be fed highly palatable calf meal or pellets. In extreme cases where calves less than 60 kg have to be weaned, they will require milk replacer and high quality baby calf meal or pellets. Basically the smaller the calf at weaning, the higher the nutritional requirement will be. Also it is a good idea to divide calves into groups based on weight and age for targeted supplementation and management.

What to feed weaners of different ages:

Weaners: 1 to 4-5 weeks old

Ideally calves should not be weaned this young but in extreme circumstances it may be necessary, or orphaned calves may need to be fed. At this young age, a milk replacer is required as the rumen is not developed enough for baby calves to survive on a non-milk diet. It is important to feed milk from a teat rather than let calves drink directly from a bucket, because the suckling action closes off the oesophagus groove which prevents milk getting into the undeveloped rumen where it can ferment and cause scouring. Milk replacer should be fed at about 10 per cent of body weight per day, and calves need only be fed once a day from about one week of age. They should also be provided with ad lib (as much as they want) access to good quality hay and a high energy, high protein (18-21% crude protein (CP)), grain-based ration.

Weaners: 5 to 10 weeks of age

Most calves weigh between 50-75 kg at four to six weeks of age and 85-100 kg at 10 weeks. At this stage, there is generally no need for a milk replacer but rather a high energy (12-12.5MJ/kg Dry Matter (DM)), high protein (16-20% CP) grain-based diet with ad lib access to good quality hay is adequate. There are specifically designed calf pellets or meals available for early weaned calves of this age and they often control a coccidiostat to prevent scours.

If possible, calves of this age should gain 0.5 to 0.8 kg per head (hd) per day to ensure normal development and performance later in life. Intake of the grain based diet is likely to be 1 to 2.5 kg/hd/day across the weight range. Molasses based diets are not preferred for very young weaners as their digestive systems are not well enough developed (resulting in scours). However it can be used if other options are not available or the molasses mix is only a component of the diet. Urea should not be fed to very young calves as it can be toxic.

Weaners: 5 months and older

Typically weaners of this age weigh more than 100 kg and are considered 'normal' weaners and so don't require special supplementary feeding as long as they have access to sufficient good quality pasture.

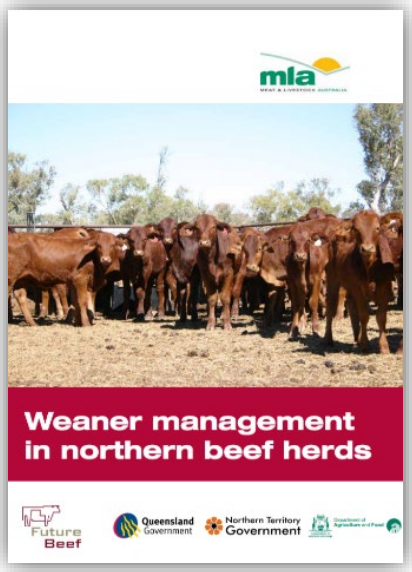
However, supplementary feeding is still likely to be required if drought conditions have persisted. Suitable options include various commercial weaner mixes, molasses mixes, grain mixes, straight protein meal and whole cottonseed.

Weaner health

The health of weaners should be monitored closely and interventions made when necessary. It is a good idea to vaccinate for clostridial diseases (e.g. with "5-in-1") at the first opportunity and to give a booster six weeks later. A botulism vaccination is also recommended at weaning. Early weaners are more susceptible to coccidiosis which causes ill-thrift, scours and even death in acute cases. Typical signs of the disease are blood stained faeces (scours), weakness and dehydration. If calves survive the five to six days of the disease, they become immune, but severely affected calves will remain poor doers. Prevention of coccidiosis through adequate hygiene, nutrition and the use of coccidiostats (e.g. Rumensin) is the best approach. Note that rumen modifiers such as Rumensin can be toxic if an animal ingests too much, so it is important to mix it in evenly.

Scours can also be caused by other microorganisms and digestive upsets. It is important to provide adequate hygiene and to treat affected animals promptly. Dehydration is common and can be managed through the use of electrolytes. Treatment for non-digestive upset scours usually consists of a program of oral treatments and perhaps antibiotics. Young stressed weaners may also be more susceptible to other sicknesses such as respiratory problems and pink-eye. These should be treated appropriately when observed. Consult your veterinarian if in doubt about the prevention and treatment of health problems in early weaned calves.

More information



There are some very good sources of information available on the internet for free download.

The "**Weaner management in northern beef herds**" booklet can be downloaded from the Meat and Livestock Australia website[2]

"**Dry season management of a beef business - A guide to planning, managing and supplementary feeding**" is a Queensland Department of Agriculture and Fisheries publication that is available from the FutureBeef website[3].

See the Queensland Department of Agriculture and Fisheries webpage on early weaning[4] for additional information.

If you have any further questions please contact:

Tim Schatz | Email: tim.schatz@nt.gov.au | Phone: (08) 8999 2332

[2] https://www.mla.com.au/news-and-events/publications/
[3] https://futurebeef.com.au/knowledge-centre/weaning/ There is further information about weaning and supplementation in the knowledge centre.
[4] https://www.daf.qld.gov.au/business-priorities/agriculture/disaster-recovery/drought/managing/early-weaning

March 2019 Pastoral Feed Outlook

Dionne Walsh, Rangeland Program Manager, DPIR Darwin
Dale Jenner, Pastoral GIS Officer, DPIR Darwin

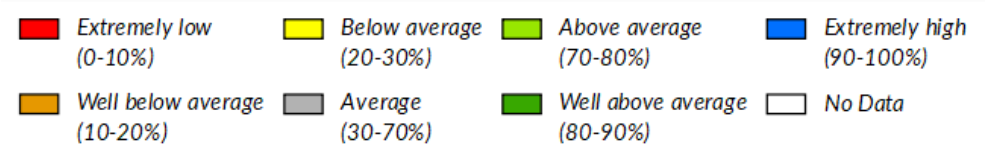
DPIR publishes a Pastoral Feed Outlook every quarter. The next edition is out now. If you would like to automatically receive the Pastoral Feed Outlook when it is released, click on the "subscribe" button on our department webpage.[5]

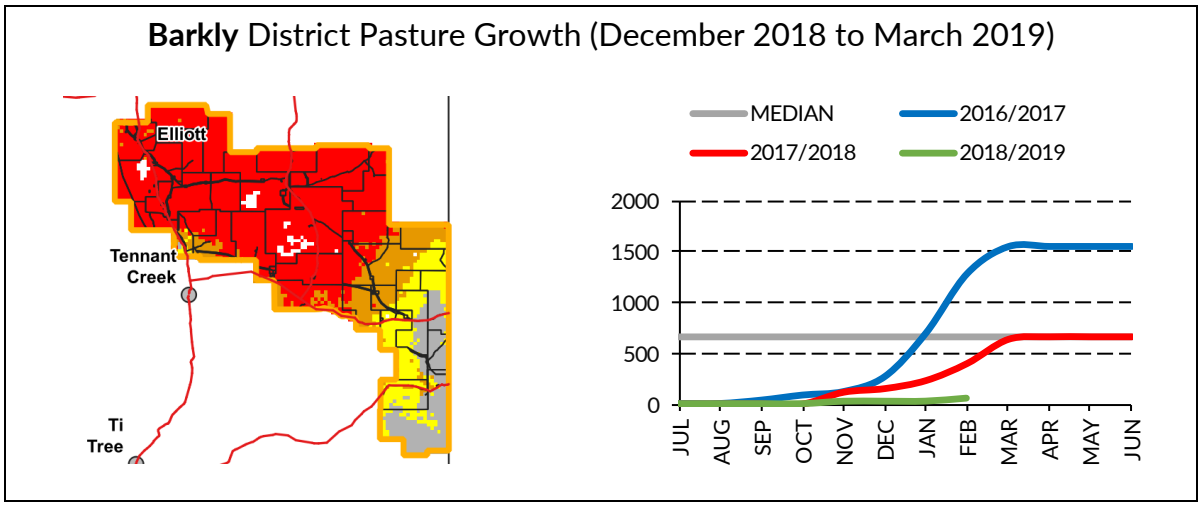
The Pastoral Feed Outlook includes information on:

- the current estimated feed supply
- recent and anticipated pasture growth and how these compare to long-term records
- the seasonal outlook for the coming months
- emerging drought conditions
- the risk of wildfire.

It will come as no surprise to most that the wet season in the region has been very poor. But the images below help to visualise the extent of the issue and highlight that the pasture growth experienced this wet season is some of the lowest on record since 1957 (areas in red). Unfortunately the outlook for the coming three months is not very positive – hotter and drier than average conditions are expected to persist over much of the NT.

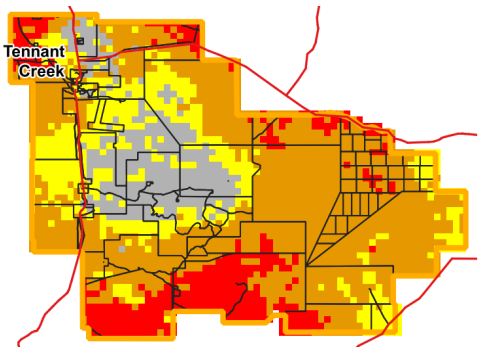
Map colours indicate how the past 3 months compare to the same period in all years since 1957

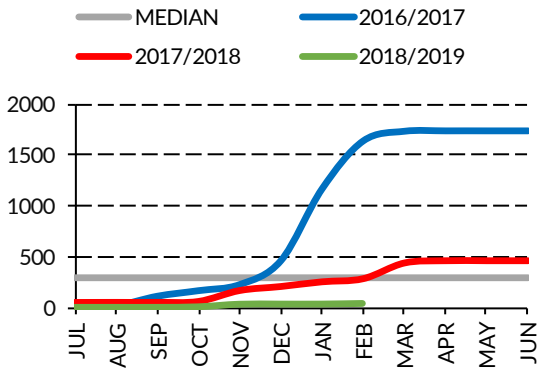




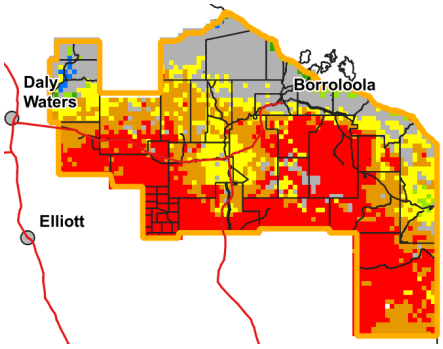
[5] https://dpir.nt.gov.au/primary-industry/primary-industry-publications/northern-territory-pastoral-feed-oulook

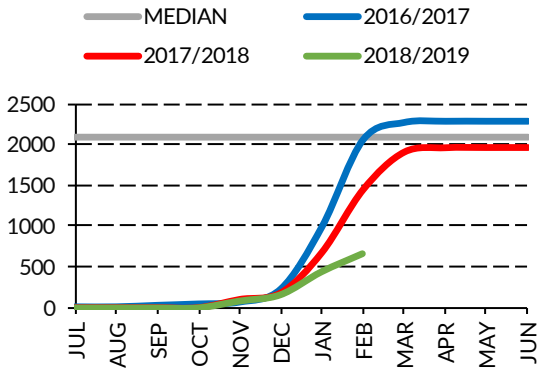
Tennant Creek District Pasture Growth (December 2018 to March 2019)



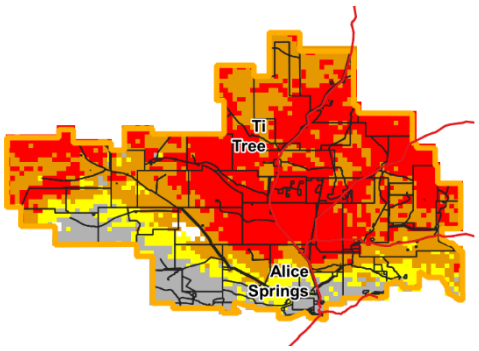


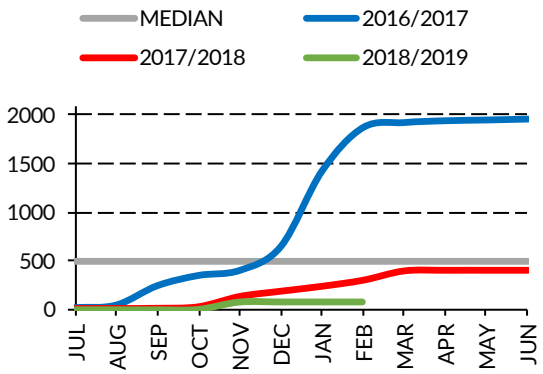
Gulf District Pasture Growth (December 2018 to March 2019)





Northern Alice Springs District Pasture Growth (December 2018 to March 2019)





If you have any questions about the Pastoral Feed Outlook, please contact Dionne Walsh – dionne.walsh@nt.gov.au.

Drought support in the Northern Territory

- The Northern Territory Government (NTG) **does not have a formal drought declaration process.** However Department of Primary Industry and Resources (DPIR) officers based throughout the Territory track rainfall and pasture growth conditions. Quarterly updates are provided through the Pastoral Feed Outlook available on the DPIR website. [6]

- The Australian Government has made funding available to producers who have been affected by drought conditions. **Drought Concessional Loans** of up to $1 million are delivered through the national Regional Investment Corporation (RIC). Further information is available at the RIC website [7] or by calling 1800 875 675.

- **Rural Financial Counselling Services** (RFCS) are available to support producers with free independent and confidential support and business analysis, including help with applications for available government financial assistance schemes. RFCS are provided by Rural Business Support (RBS) based in Adelaide, with Counsellors making regular visits to the NT to meet with clients. RBS can be contacted on 1800 836 211.

- The **Farm Household Allowance** (FHA) provides assistance to farming families experiencing financial hardship. The FHA is administered by the Department of Human Services and further information is available at the Department of Human Services website. [8]

  DPIR will soon open the **On-Farm Emergency Water Infrastructure Rebate Scheme** in the Territory. This scheme is available to eligible producers to implement new water infrastructure for livestock watering with a rebate of up to 25 per cent of costs available. For further information visit the NTG website[9] or contact Mr David Collinson, DPIR Industry Support Officer, on 8936 4089 or email david.collinson@nt.gov.au.

- Producers are encouraged to visit the **National Farmers Federation Farm Hub** for a comprehensive list of support schemes available for the Territory at the Farm Hub website. [10]

Figure 2. Storm rolling in. Photo credit: Melissa Wooderson

[6] https://dpir.nt.gov.au/primary-industry/primary-industry-publications/northern-territory-pastoral-feed-outlook
[7] http://www.ric.gov.au/
[8] www.humanservices.gov.au/individuals/services/centrelink/farm-household-allowance
[9] www.nt.gov.au/farm-management/get-financial-help-farm-businesses
[10] https://farmhub.org.au/region/nt/

The bull for tomorrow

Whitney Dollemore, Pastoral Research Officer, DPIR Katherine

One of many important decisions you will make this year will be which bulls to remove from your herd and the purchase of replacement bulls. Bull selection is a decision which will affect your herd performance and profitability for the next 10 years if you retain females from your own herd as replacement breeders.

It can be difficult to accurately predict the exact features of the animals that will be most desirable to turnoff to market ten years from now, but there are some traits that are equally as important now as they will be in the future. The environment is likely to become more extreme in the future and so a cow that is unproductive under current conditions will remain so in the future. Fertility and functionality are never going to be undesirable in the breeding game and so selecting bulls for environmental adaptation, functionality and fertility should be a good place to invest in the long term. That being said, growth cannot be ignored either. We are and will continue in the future to be paid on kilograms turned off our property. The faster market weight is reached the more kilograms are turned off each year.

The biggest challenge to a bull buyer is how to rank traits by level of importance to maximise profitability of the breeding operation. Running a larger number of less productive females can make up the turnoff numbers for a period of time but is not a good long-term sustainable strategy to balance pasture utilisation and animal turnoff. If running more cows, there is greater competition for pasture and so it is harder for cows to maintain body condition resulting in lower reproductive performance and hence, less weaners produced over a lifetime. Moderate-sized cows may produce calves with lower weaning weights but will produce more weaners and hence, more kilograms turned off per area of land as there are less cows eating grass without producing a weaner each year.

There is then the question of the genetic ability of a cow to produce a weaner each year. Some cows have the genetics to reconceive whilst lactating and others will only cycle after lactation is stopped (weaning). Selecting a bull that will produce daughters with the ability to cycle whilst lactating can shorten the inter-calving interval from 18 to 12 months. This can be achieved if cow body condition is maintained by matching stocking rate to carrying capacity and setting the heifer up in the first instance to calve at the correct time of the year i.e. the wet season.

3 a)

3 b)

Figure 3 a & b. Cool, calm and curious Brahman and Composite bulls ready for sale day on the 18th of June 2019. Photo credit: Whitney Dollemore

Growth to turnoff (e.g. 350kg at 18 months old) can be balanced with fertility; just because you select for one doesn't mean you have to completely sacrifice the other. There are animals that have good growth up to 18 months old but then produce a mature cow that is below the average. These animals are called "curve benders" and are worth their weight in gold! However, they can be hard to spot on face value. Estimated Breeding Values (EBVs) can give a bull buyer the information to identify the curve benders and are the ideal way to objectively select bulls that meet your criteria. EBVs alone are not sufficient and a BullCheck for breeding soundness with the percent normal sperm being reported is also required to guarantee you are buying a premium product that is going to give you the bull you want today for the cow you need tomorrow.

If you would like any information on creating a breeding objective for your business or selection of bulls to meet your breeding objective please contact Whitney Dollemore at Katherine Research Station.

Whitney Dollemore
E: whitney.dollemore@nt.gov.au
P: (08) 8973 9749

Wild dog management survey – don't miss out!

- The wild dog project ends 30 June 2019
- Information will be used to help develop best-practice guidelines for the NT
- Of particular interest is the link between `management' & `impacts on young cattle'
- The more information we get, the more reliable the findings
- Individual properties will not be identified
- Thanks to everyone who has participated so far

How you can contribute:

- Questionnaire Survey on Survey Monkey's website[11]-
- `Dog-bite' records at Round 1 musters on Survey Monkey's website [12]

For further information contact:
Kieren McCosker DPIR (8973 9771) Kieren.mccosker@nt.gov.au,
Will Dobbie DENR (0407 215 511) William.Dobbie@nt.gov.au

Figure 4. Will Dobbie (DENR) & Jo Miller (DPIR) on the road in December 2018 conducting wild dog impact surveys

[11] https://www.surveymonkey.com/r/dogmanagement
[12] https://www.surveymonkey.com/r/dogbite

Does supplementing cows with phosphorus during pregnancy change weaner performance?

Kieren McCosker, Senior Livestock Scientist, DPIR Katherine

Phosphorus (P) often restricts beef production in northern Australia. When an animal's P demand cannot be met either from the diet or by mobilising body reserves, dietary intake and growth are typically dramatically reduced. Therefore, it is currently recommended that heifers and cows grazing low P areas be supplemented during late pregnancy and while lactating.

A trial currently running on Victoria River Research Station (also known as Kidman Springs) in the Northern Territory (NT) has reported substantial reproduction and productivity gains from P supplementation. See more at the Future Beef website[13]. Work by Dixon shows that pre-weaning calf growth is also constrained when cows are on low P diets during late pregnancy and lactation. To investigate post-weaning performance, a pen study was recently conducted at the Katherine Research Station, NT measuring the effect of P supplementation with cows during pregnancy and lactation on weaner weight and on weaner growth when fed high and low P content diets.

Four year old Brahman cows grazing P deficient paddocks on Kidman Springs were used to supply the trial weaners. In June 2018, 43 calves were weaned off cows which received a P supplement during pregnancy and lactation (CowP+) and thirty mixed-sex calves were weaned from cows with no P supplement (CowP-).

In September (at eight to10 months of age), after co-grazing native pastures on Kidman Springs, the weaners were relocated to Katherine Research Station and randomly allocated to either a low P (WnrP-, 0.5 g P/kg DM) or high P (WnrP+, 2.8 g P/kg DM) weaner diet group. Each treatment was replicated three times, with each replicate equal to a pen of two to four animals; the treatment groups were:

- Steers from –P cows, fed –P pellet
- Steers from –P cows, fed +P pellet
- Steers from +P cows, fed –P pellet
- Steers from +P cows, fed +P pellet
- Heifers from –P cows, fed –P pellet
- Heifers from –P cows, fed +P pellet
- Heifers from +P cows, fed –P pellet
- Heifers from +P cows, fed +P pellet

Figure 5. Heifers from P+ cows fed P- weaner diet

The weaners had unlimited access to the experimental pellet for 64 days with their changes in weight measured. Liveweight was recorded after a 15 hour curfew at the start and end of the pen experiment, with interim uncurfewed weights recorded weekly.

[13] https://futurebeef.com.au/projects/effect-of-phosphorus-supplementation-on-brahman-females-at-kidman-springs/

Preliminary results

- At the beginning of the experiment weaners from P supplemented cows were heavier than from unsupplemented cows. On average, heifers from P+ cows were 6.4 kg (174.5 vs. 168.1) and steers were 23.9 kg (183.2 vs. 159.3) heavier, than weaners from P- cows. These differences are thought to reflect differences in cow body condition score at calving and milk quantity.
- Weaner diet in the pens had a highly significant effect on growth (P<0.001), which was independent of cow diet.
- Overall, the average growth of weaners on the P+ diet was 40.9kg greater than the P- weaner diet. The growth of weaners on the P- weaner diet appeared to plateau after approximately 4 weeks of receiving the diet.
- Differences in growth are likely to be due to reduced intake of weaners on the P- weaner diet.

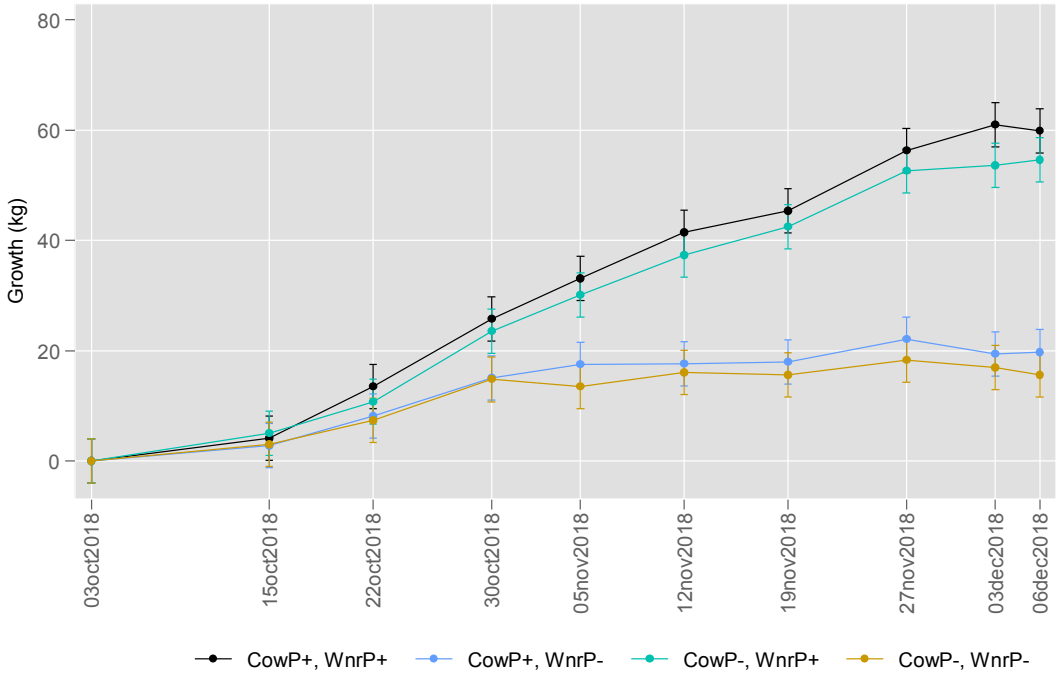


Figure 6. Growth of weaners fed high and low P diets

Throughout the trial information on changes in hip height, feed intake and blood samples for measurement of Plasma Inorganic Phosphorus (PiP) have also been collected and plan to be analysed during 2019.

The preliminary results suggest that the P content of cow diet during pregnancy and lactation influenced initial weaner weight, but had little or no effect on post-weaning performance. Weaner diets low in P were shown to significantly affect the post-weaning performance of young cattle. The finding from this study demonstrates the dominating effect of nutrition on weaner performance as well as the persistence of weight losses imposed to calves prior to weaning.

Kieren McCosker
Senior Livestock Scientist
Phone 08 8973 9771
Email: Kieren.McCosker@nt.gov.au

Are you up for the 2019 MLA phosphorus challenge?

Do you want to be part of Meat Livestock Australia's (MLA) phosphorus challenge? MLA are looking for 100 producers willing to participate in blood sampling of nominated mobs to determine their P status. It will lead to an assessment of the P status of northern herds and help demonstrate that supplantation provides a cost benefit.

To be eligible, producers must be able to:

- Yard stock at a time nominated for sampling OR can organise a technician, extension officer or vet to collect the samples during routine husbandry practices before the end of May 2019.
- Have adequate stock handling equipment, such as a vet crush.
- Have young breeders, heifers OR steers on a good plane of nutrition.

Producers should also meet at least two of the following criteria:

- Have cattle grazing in a known P deficient region OR an old cropping paddock.
- Steers/heifers achieving annual growth of less than 120kg OR a record of poor reproductive performance.
- Understand they're managing P deficient country and feed P (but want to know if supplementation is sufficient).
- New to the industry and keen to manage any P deficiency to improve production.

Producers interested in the 2019 P Challenge should contact their local Regional Beef Research Committee chair. You can find their contact details by visiting the North Australia Beef Research Council's website[14] and selecting your region.

For more information about the P Challenge contact:

Dr Nigel Tomkins
MLA Project Manager – Research and Development Grassfed Beef
Email: ntomkins@mla.com.au

Figure 7. Females grazing P deficient country in the VRD. Photo credit: Jo Miller

[14] http://www.nabrc.com.au/regional-committees/

Meet the new extension agronomist

Joy Sherlock, Senior Extension Agronomist, DPIR Katherine

The Department of Primary Industry and Resources (DPIR) would like to welcome Joy Sherlock to the Plant Industry Branch team at Katherine Research Station. Joy brings a wealth of experience in agricultural extension and practical, real life experience of owning and managing a pastoral lease in Western Australia and working as an agronomist involved with broadacre cropping. Expect to see Joy working with regional grower groups, assisting agricultural industry development and guiding diversification. I will let Joy introduce herself.

"I recently started as the extension agronomist with DPIR based in Katherine. My career began in the agricultural industry working in various enterprises from picking vegetables at eight years old on the family market garden, working as a farm hand on livestock/cropping properties, driving tractors for seeding and harvest, and in our own livestock enterprise, and further to entering the agricultural research field as a skilled technician many years ago. Seeing first hand the difficulties facing producers, such as volatile markets and unpredictable weather, the research side of things and strategic business planning for mixed farming enterprises fascinated me and drove me a desire to learn more to better help producers in the future. I went to university as a mature age student to obtain an Agricultural degree before working as a facilitator with the WA Government's pilot drought reform/farm business resilience project to build capacity and better manage risk in farming businesses across WA.

I spent a few years heavily involved with environmental management and later as an agronomist. I have seen directly the issues facing farmers and pastoralists, the challenges, devastation, and the good times. I hope to use these life experiences and knowledge gained to make a difference in the NT agricultural industry with the support of the amazing team I now work with. From my time working with the industry and also being a producer myself I really see the necessity to diversify, and build capacity and resilience within individual businesses. Australia is facing issues with climate and volatile markets; things can change very quickly and producers need to have various options available for the bad times. I have also been involved with pastoral cattle production for the last 14 years running Droughtmaster/shorthorn crosses for both the domestic and export markets. Please come into the Katherine Research Station or contact me at any time to learn about and see first hand the work of the plant industries branch or ask for farm agronomic advice. I look forward to meeting you in the future.

Joy Sherlock
Senior Extension Agronomist
Katherine
P: (08) 8973 9724
M: 0436 425 441
E: joy.sherlock@nt.gov.au

Figure 8. New senior extension agronomist, Joy Sherlock, in a cotton field on a recent tour to Queensland

Profitable Grazing Systems

Rebecca Mohr-Bell, Argyll Consulting, NT PGS State Coordinator

Rebecca Mohr-Bell, profitable grazing systems (PGS) NT state coordinator, and Joy Sherlock, Senior Extension Agronomist with DPIR, have been hatching plans for an improved pastures PGS group. While details are still being confirmed, more information about the PGS program and the proposed improved pastures group will be available at the upcoming field days being held at Katherine Research Station and Douglas Daly Research Farm, on Tuesday 9 and Wednesday 10 April respectively (see advertisement on previous page).

If you would like more information but are unable to attend the field days you can contact Rebecca by email rebecca@argyllconsulting.com.au or phone (08) 8977 0134

For more information about the PGS program you can visit the PGS webpage on the MLA website[15]

[15] https://www.mla.com.au/extension-training-and-tools/profitable-grazing-systems/

The Savanna is on fire, but often in a good way these days

Robyn Cowley, Senior Rangelands Scientist, NT DPIR

Attendees from across northern Australia shared their experiences in managing fire at the Savanna Fire Forum held at Charles Darwin University on the 13-14 February. It's been 13 years since the first fire abatement project started in West Arnhem Land. But, since the development of the savanna burning abatement methodology the increase in land managed to reduce the extent and frequency of late dry season fires has been rapid (Figure 9). There is now a whole industry servicing and implementing savanna burning projects across the north.

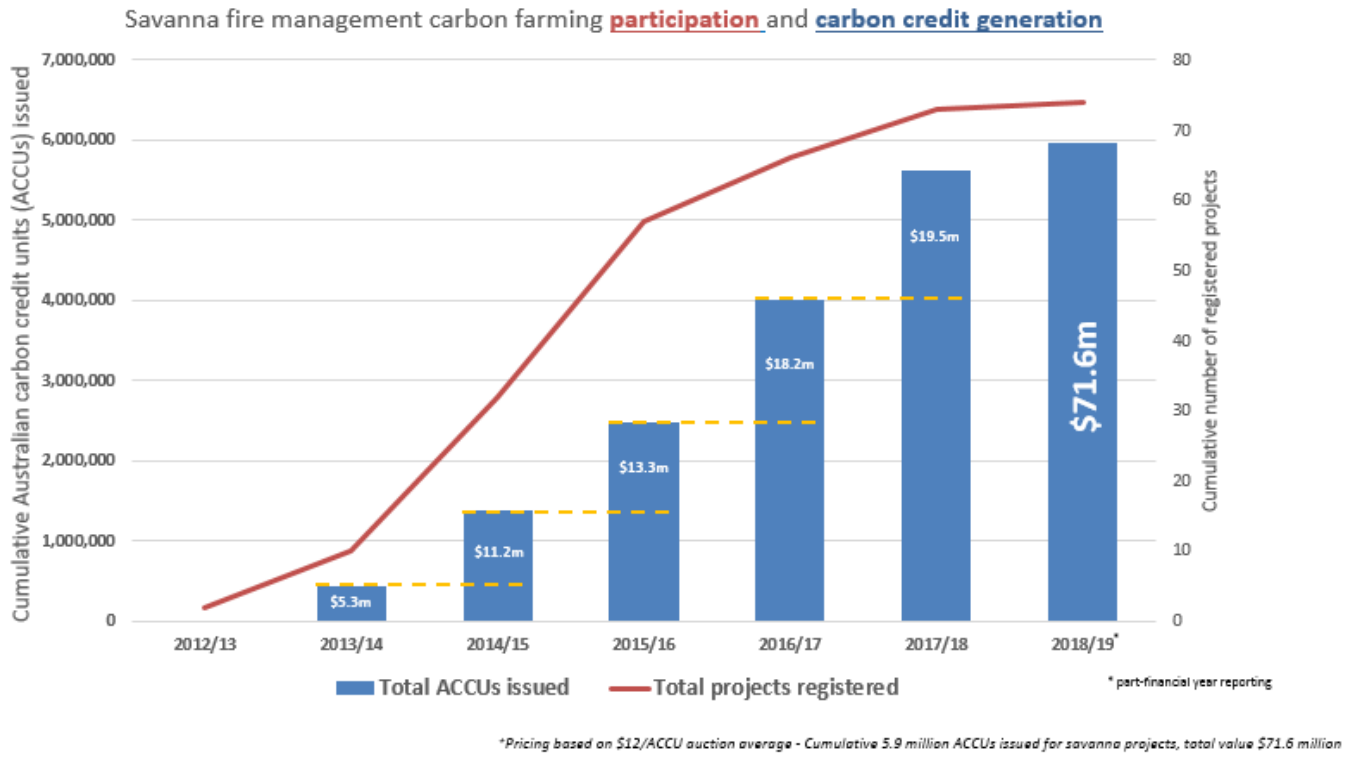


Figure 9. Increase in number of savanna burning projects and carbon credits issued. From Sam Wagstaff's (Dept of Environment and Energy) presentation at the forum.

Savanna burning is now a major land use activity and income stream on Aboriginal-managed land across northern Australia. There are 25 Aboriginal savanna fire projects run by ranger groups covering 173,000 km^2. 68 per cent of these are in the NT. They provide an annual income of $16 million through greenhouse gas emissions avoidance projects.

The money from the savanna burning projects is used to implement better fire management, including training Aboriginal ranger groups in early dry season burning and late dry season fire suppression on their country. Many ranger groups go on walks through their country and light up in the early dry season. Gaps are filled in by dropping incendiaries from helicopters.

The common message from ranger groups was that the planning and consultation phase was the most important for fire project success (Figure 10). This involved visiting and meeting with the Traditional Owners across large areas to plan where they wanted to burn, and learning about *rightway fire*.

The Aboriginal ranger groups felt that although the projects were aimed to reduce greenhouse gas emissions, this was not the main reason they became involved. Rather the cultural, social and ecological benefits of better savanna burning were more important for Aboriginal communities. The savanna burning projects provide a source of income, training, meaningful employment, and opportunity to be on country and exchange knowledge, which is thought to provide additional health benefits for people and country.

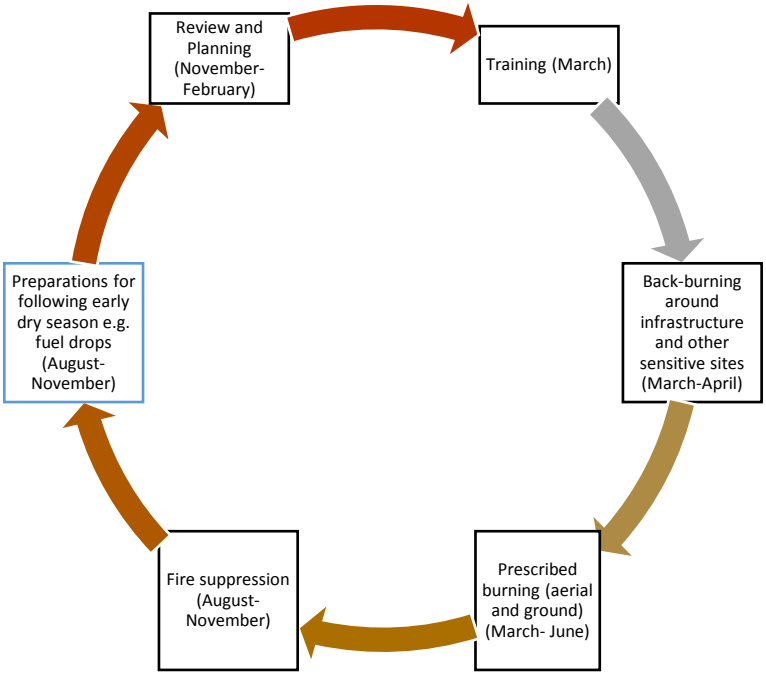


Figure 10. Typical annual fire project cycle of consultation, planning and management used by the Wunggurr Rangers in the north Kimberley. From the presentation by Luke Ross and Robin Dann at the forum.

Savanna burning projects have typically halved the proportion of the land area that burns late in the dry season, but increased the proportion that burns early in the dry season. Often the total area burnt is not that much less than before the savanna burning project started (typically in the order of 10% of the total area), but fires tend to be cooler, patchier and more interspersed with unburnt areas.

The patchier cool season burns have had good outcomes for critters who need cover to protect them from predators and provide places to live. Monitoring of feral cats in the Kimberley found that they travelled long distances to late dry season burnt areas, avoiding less severely burnt areas. Cats also killed more of the critters they chased in these late hot burnt areas, because the late dry fires are so severe they leave no unburnt patches for critters to hide in.

Monitoring of mammals in the savanna burning projects has found increases in many of the rarer small mammals, although not all mammals benefited. In the Kimberley, high conservation value species including the golden backed tree rat, brush tailed rabbit-rat, grassland melomys, northern brown bandicoot, red cheeked dunnart and Kimberley Rock Rat all increased. But some of the more common mammals decreased under savanna burning methodology including the northern quoll and more common rodents, the delicate rat, pale field rat and common rock rat. So there is more work to do to perfect fire regimes, but they are trending in the right direction.

What is savanna burning abatement methodology?

To help reduce global greenhouse gas emissions, the Australian Government pays land managers each year based on the greenhouse gas emissions that they avoided (abated) through better fire management. See more at the Australian Government website. [16]

So if an area previously had lots of late dry season fires, land managers can be paid by the Australian Government if they successfully reduce the area and frequency of late dry season fires. This is measured through satellite mapping of the timing, extent and frequency of fires, so you can't cheat!

It is up to the land managers how they achieve this, as long as it is not through removing the fuel by grazing. However, usually it requires planned burning of the landscape during the wet and early dry season, when fires are less severe. This creates cool patchy fires that don't burn as much of the grass and woody plants, and hence have fewer greenhouse gas emissions. It reduces fuel loads and creates fire breaks across the landscape that help to stop late dry season fires from spreading too far. Fewer hot fires also leads to increased woody cover, and therefore more carbon stored in the landscape. This is good if you want to be paid to grow carbon, but maybe not so much if you want to grow cattle, because woody plants can compete with the pasture layer, leading to reduced grass for cattle. Additional savanna burning methodologies are being developed now that will allow land managers to be paid for the extra carbon they have stored as well as the emissions they have abated, but to be part of this new methodology land managers must agree to lock their land into the project for at least 25 years, so it will not suit everyone.

Is savanna burning relevant for grazed land?

It depends. Some stations will have almost all of their land used for grazing, and fire will not be that frequent, so there is no need for a savanna burning project to reduce fire frequency. The more productive grazing land in northern Australia often has too little, rather than too much fire. However some stations have less productive land that is either not used for grazing, or is only lightly grazed, leaving high fuel loads. These areas often have frequent fire and could be better managed to reduce late dry season fires. There are quite a few cattle stations in the Kimberley and North Queensland that have fire projects for this reason.

It's not straight forward to develop savanna burning projects and it is likely you will need to get outside help to develop and manage one. Things to consider if contemplating a savanna burning project include:

- Do you have areas with a history of a lot of late dry season fire?
- Are these frequently burnt areas eligible vegetation types for savanna burning projects?
- Will the project area be large enough to offset the project administration costs?
- Or will you need to develop a combined or "aggregated" project with neighbours to make it economically viable?
- How will you manage the project over all the aggregated project area?
- Do you have consent from the native holders of your land to have a fire project?

[16] http://www.cleanenergyregulator.gov.au/ERF/Choosing-a-project-type/Opportunities-for-the-land-sector/Savanna-burning-methods

Happenings around KRS

11 a)

11 b)

11 c)

*Figures 10 a, b & c. Dryland cotton planted on the **INSERT DATE HERE** growing well despite the unusual start to*

Figure 12. Irrigated cotton variety Bolgard 3, being inspected by Nick Hartley and Heshan Jayasekara of DPIR Plant Industries, offers characteristics that enable a reduction in chemical use for growers

Figure 13. KRS farm manager Jack Wheeler coming up with a plan for the harvest of the Cassava trial with Dave Hancock and Kieren McCosker (hiding behind the plants)

Figure 14. Assessing dryland rice at KRS. The slow start to the wet is proving difficult for the rice.

Out and about

Figure 15. Arthur Cameron assessing improved pastures

Figure 16. A Leucaena and mixed pasture demonstration at Douglas Daly Research Farm

Figure 17 a. Checking out the gamba grass (and the scenery) at the Gamba grass information day at Katherine Rural College

Figure 17 b. DPIR extension officers Joy Sherlock (front) and Jo Miller (back) get an aerial view of gamba grass around Katherine

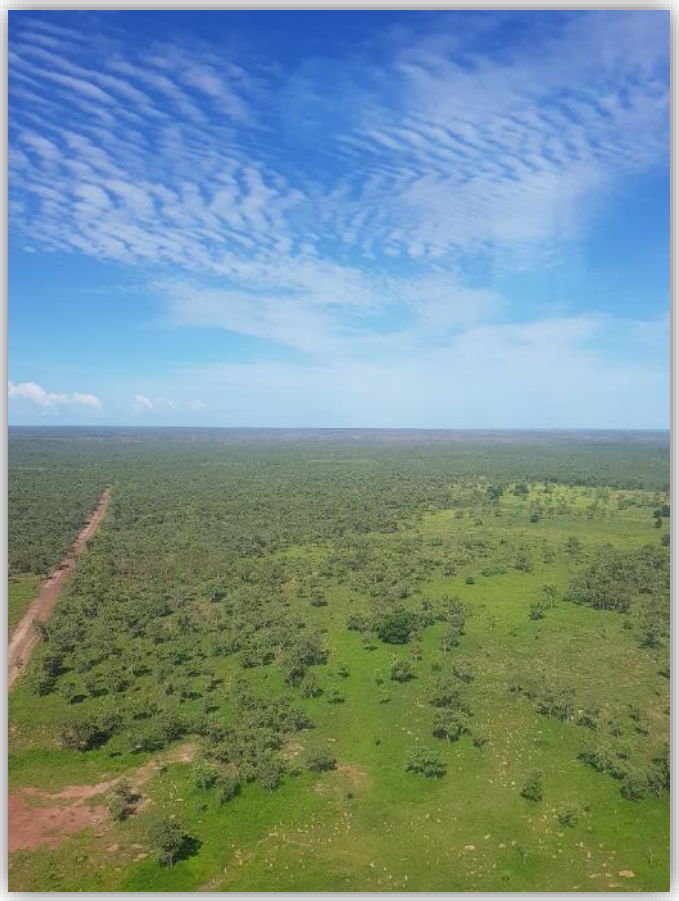
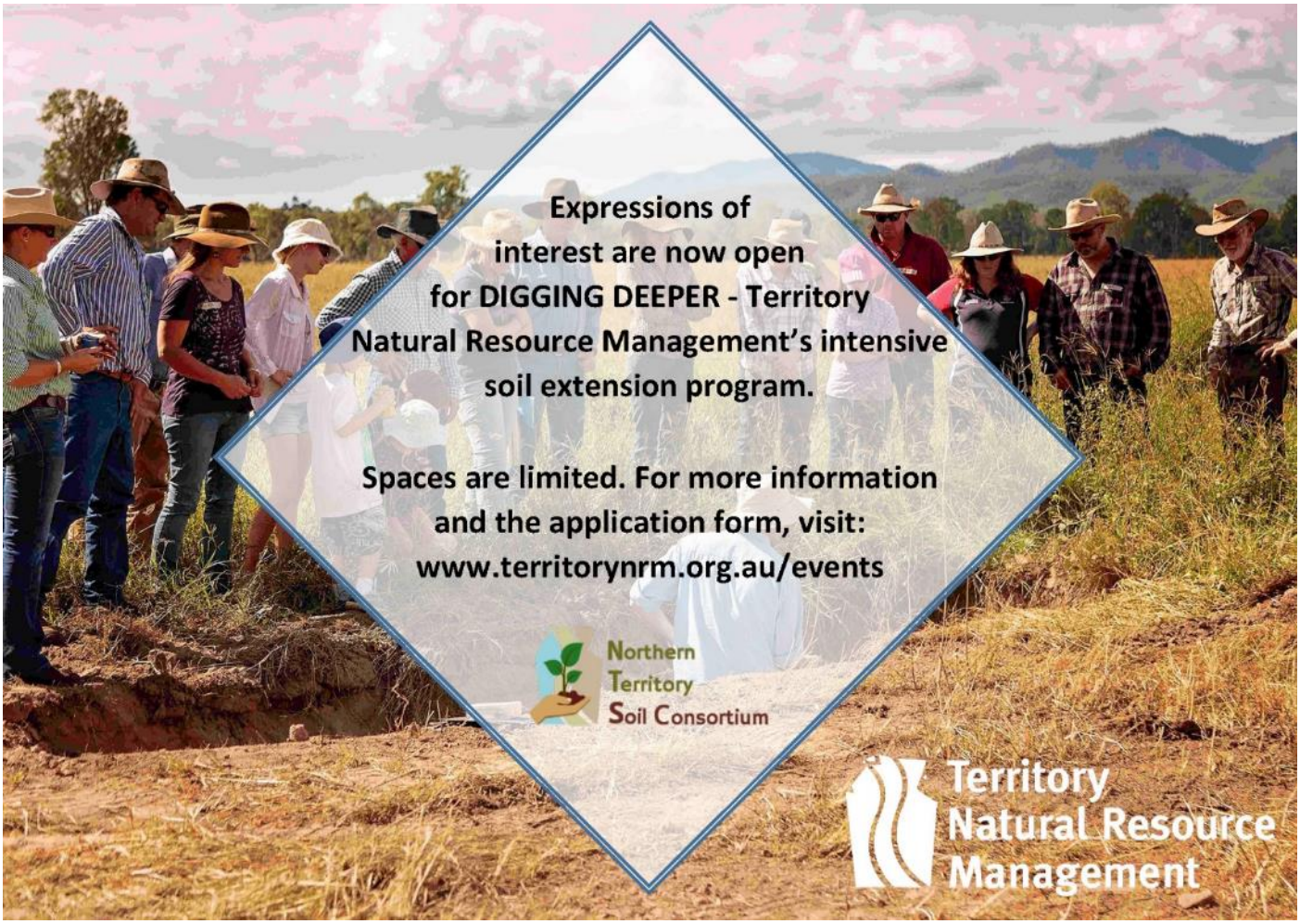


Figure 17 c. Birds eye view. Spot the gamba grass

Soil extension program

Jacob Betros, Regional Agriculture Landcare Facilitator, Territory Natural Resource Management, Darwin

Territory Natural Resource Management (TNRM) is offering an intensive soil extension program which aims to help farmers understand the processes going on in their soil and give them a helping hand to implement changes that will address their soil's "issues". It is a hands on approach to investigating what is below the surface and how that relates to productivity of what happens above the soil surface. The program is being offered as part of the Northern Territory Soil Consortium – a project delivered by TNRM for the National Landcare Program: Smart Farms Small Grants.



Burning questions answered at gamba grass information day

An issue that's getting a lot of attention at the moment is how to manage gamba grass in the Katherine region.

Last month Edith Farms Volunteer Bushfire Brigade, with support from the Territory's Weeds Branch and BushfiresNT put on an event at Charles Darwin University which saw experts in the field focus on the risks of not managing the weed and how everyone can work together to manage its spread.

More than 50 people attended the event and many of the attendees got a free ride in a helicopter to see where gamba grass was in the region, especially on the individuals' properties.

If you want more information on how you can manage gamba, contact the Weed Management Branch on 08 8999 4567 or visit the Northern Territory Government website[17]

Figure 18a. Gamba grass spotting from the air
Photo credit: Ilka Novak

Figure 18b. Katherine locals hearing the latest on gamba grass control and what they can do to manage the weed
Photo credit: Ilka Novak

Have your say on Parthenium management

Landholders in the Katherine region are being urged to complete a survey which will help protect the industry from parthenium weed (*Parthenium hysterophorus*).

As a result of an outbreak of parthenium weed near Katherine late last year, the Weeds Management Branch has been conducting an intensive management program.

The survey is part of the work weeds officers are doing to identify the potential risk parthenium weed poses to other pastoral operations.

If you've not yet had the opportunity to complete the survey or would like to talk to a weeds officer, please call 8973 8857 or for more information visit the weeds page of the NTG website. [18]

Figure 19a. A young parthenium plant

Figure 19b. Parthenium weed flowers

[17] https://nt.gov.au/environment/weeds
[18] https://nt.gov.au/environment/weeds

Biofertiliser – what's it all about?

Territory Natural Resource Management will be running a three day biofertiliser course as part of the NT Soil Consortium. Biofertiliser is a ferment made from a biological base in water and enriched with foods to feed biology and minerals for biology to digest. The final product becomes a solution that contains chelated minerals, biocoloides, hormones, biocatalysts, and micro-organisms. It can nourish, regenerate and activate life in the soil, it revitalises plants and stimulates their immune system against disease, fungi and insect attack. It can also be used as a substitute for expensive chemical and biological fertilisers. Attendees will learn about soil and plant health and the value of using organic and biological inputs that chelate bio-available minerals in solution, utilise beneficial microbes and prevent pest and disease outbreaks.

The course will be held 4-6 June in Darwin.
For more information, please contact Jacob Betros (jacob.betros@territorynrm.org.au)

Digging Deeper – Intensive Soil Extension Program

Jacob Betros, Regional Agriculture Landcare Facilitator, Territory Natural Resource Management, Darwin

Territory Natural Resource Management will be running the Digging Deeper program in 2019. This program aims to help farmers understand the processes going on in their soil and give them a helping hand to implement changes that will address their soil's "issues". It is a *hands on* approach to investigating what is below the surface and how that relates to productivity of what happens above the soil surface.

This Expression of Interest (EOI) is for farmers from any industry in the Darwin and surrounds and Katherine regions who wish to participate in this project in 2019. The project is limited to 12 farm business split in two groups, who will take part in the following three project components:

- Soil pit day
- Three soil health sessions for each region and held on property (each property hosts half a day)
- Soil health interpretation and wrap up day

As a participating business you can anticipate:

- Getting to know the other local farm business who are interested in improving their soil health
- Processional advice, education and mentoring for your issues
- A comprehensive soil test including commentated collection and interpretation. You will understand soil (one of your greatest assets) like never before!
- Gaining knowledge so you can make your soil fertility decisions.

Expressions of interest close 18 April 2019

To request an expressions of interest form or for more information please contact the Territory NM office on (08) 8942 8300 or by email to jacob.betros@territorynrm.org.au

Western Davenport water allocation plan

The new Western Davenport Water Allocation Plan 2018-2021 has been finalised.

The plan covers the Western Davenport Water Control District, an area of almost 24,500 square kilometres, located approximately 150 km south of Tennant Creek.

There was an extensive consultation period, which involved talking with the Water Advisory Committee, Traditional Owners, landholders, other key stakeholders and general public.

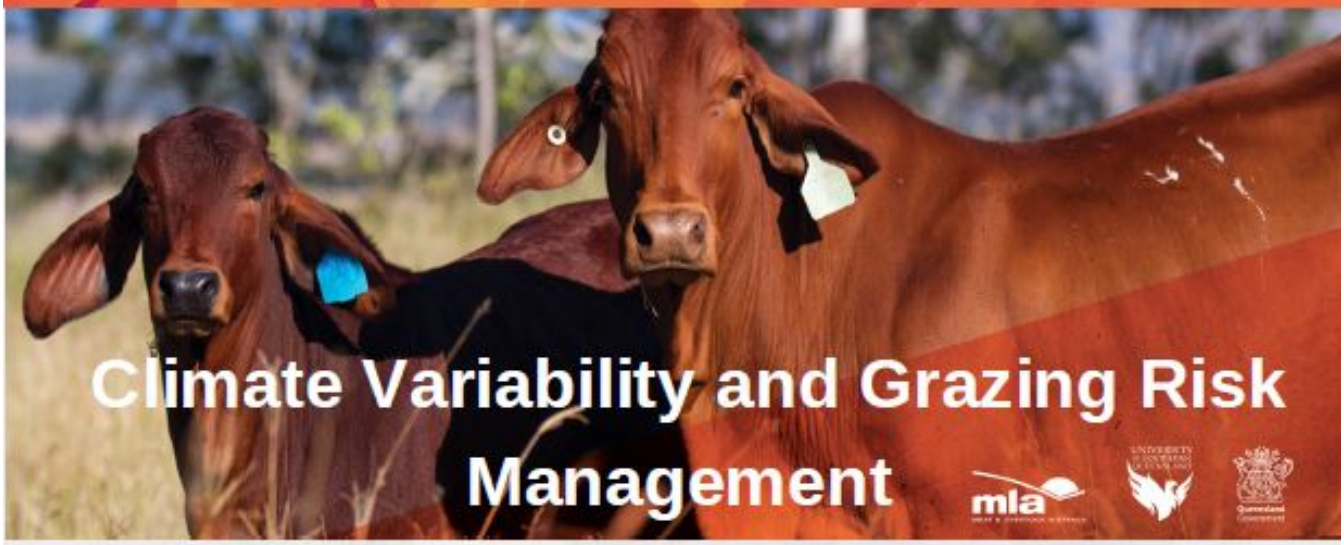
As a result, the plan will continue to support the region's economic development, while protecting and maintaining environmental and cultural values.

Figure 20. Desert Melons is the largest farm in the Western Davenport water plan area

For more information, visit the Department of Environment and Natural Resources website[19].

[19] denr.nt.gov.au/westerndavenportwaterplan

Northern Australia Climate Program



Climate Variability and Grazing Risk Management

Save the Date!

When and Where?

Broome:	1st April
Halls Creek :	3rd April
Katherine:	5th April

What is it?

A FREE workshop including and lunch and smoko, featuring:

- The Bureau of Meteorology
- University of Southern Queensland
- Local Climate Mate/s

Bringing BoM to the Bush

Why come along?

- Learn about the **latest developments** in seasonal climate forecasting and how they apply to our region
- Learn about the **key climate drivers** for northern Australia
- Learn how to **find, use and assess** relevant climate tools such as seasonal forecasts

RSVP

Anne Marie Huey	08 9191 7069	annemarie.huey@usq.edu.au
Jardine MacDonald	08 9192 5507	jardinem@rangelandswa.com.au



Northern Territory Agriculture: Pathways to Potential

KATHERINE AND DOUGLAS DALY FIELD DAYS

Join us at **Northern Territory Agriculture: Pathways to Potential**, two jampacked field days at two unique Department of Primary Industry and Resources (DPIR) research stations. The field days will have a strong focus on industry development and highlight the potential of diversified farming systems in the Northern Territory (NT).

Meet industry members, view trade displays, hear from producers regarding their experience with diversification and learn about new emerging industries.

Both field days will include a number of presentations in the morning, including:

- Cotton Australia, Adam Kay - overview of the southern cotton industry, addressing misinformation.
- Tipperary Station, David Connelly -a producer's perspective of diversification and integrating cropping and horticulture into an existing pastoral business.
- Darwin Port, Peter Dummett - an overview of how the shipping industry works including considerations for potential exporters and importers.
- Department of Environment and Natural Resources – getting my project off the ground.
- Louie Dreyfus Company, Tony Geitz- cotton market opportunities, the Australian position in the global market place and an introduction to the pricing of Australian cotton.
- Archer Daniels Midland, Damian Bradford - grain market opportunities from Northern Australia
- Feed Central, Cieran Maxwell - national hay market and opportunities for hay in the NT.

Afternoons will provide attendees with the option to view current DPIR research.

KATHERINE RESEARCH STATION
Tuesday 9 April

~ Livestock ~ Cropping ~ Horticulture ~

- information about birthing sensors and how they are assisting with calf loss research in northern Australia
- preview DPIR's sale select Brahman and composite bulls
- the latest research in beef cattle genetics in northern Australia
- aspects of cover crops, integrated pest management and cucumber green mottle mosaic virus for melon cropping systems
- opportunities for learning about and ordering new mango varieties
- cotton, soybeans, forage and grain sorghum, dryland rice and various species of pasture grass for seed production
- infield discussions with DPIR and other agronomists, market specialists, regulatory bodies and seed suppliers.

&

DOUGLAS DALY RESEARCH FARM
Wednesday 10 April

~ Livestock ~ Improved pastures ~ Forage crops ~

- impact of maternal phosphorus status and subsequent weaner performance
- using livestock to assist in the control of gamba grass and subsequent livestock performance
- update on the current fly tag trials and how they are performing in the Douglas Daly region
- update on the select Brahman females and where the herd is heading next
- irrigated Leucaena and grazing with mixed pasture inter rows
- infield discussions with The Leucaena Network
- improved pastures such as Nucal and Mulato varieties
- cotton
- potential legume pastures including desmanthus, lucerne, cowpea, blue pea, and burgundy bean production.
- infield discussions with DPIR and other agronomists, seed suppliers and market specialists.

Please confirm attendance for catering purposes and find out more by contacting:

Joy Sherlock, Senior Extension Agronomist | joy.sherlock@nt.gov.au | 0436 425 441| www.dpir.nt.gov.au

The field days are proudly presented by the Department of Primary Industry and Resources with support from the Department of Environment and Natural Resources, the Northern Territory Farmers Association and the Northern Territory Cattlemen's Association.

MAJOR SPONSORS

NORTHERN TERRITORY GOVERNMENT
GRDC GRAINS RESEARCH & DEVELOPMENT CORPORATION
LDC Louis Dreyfus Company
LANDMARK
VANDERFIELD
CSD COTTON SEED DISTRIBUTORS
AIRPOWER

Come clean, go clean!

Guidelines for farm biosecurity

Farm biosecurity is a set of measures designed to protect properties from the entry and spread of pests and diseases. It includes trying to prevent new pests and diseases from arriving, and helping to control outbreaks if they occur. It relies on assessing the risks of bringing pests and diseases onto your farm and how to prevent that from occurring.

Farm biosecurity is everybody's responsibility, but starts with you at the farm gate. It does not have to be complex or expensive to implement.

There are a range of **simple everyday practices** you can put in place to protect your farm and minimise the spread of pests and disease.

To protect your industry and livelihood, help prevent the spread of unwanted pests and diseases;

Come clean, go clean!

www.farmbiosecurity.com.au

NORTHERN TERRITORY GOVERNMENT

Animal Health News

February 2019

Inside this issue:

New Livestock Biosecurity Officer

Simone (Min) Andrews is the newest edition to the Livestock Biosecurity team in Katherine. You may know Min from her role as a Biosecurity Officer in the Kununurra/Kimberley region of Western Australia.

Min has spent majority of her life in the Kimberley region and has more than 20 years' experience in the Northern Beef Industry. Her experience and interest in this industry began when she started working in stock camps at a young age on Auvergne station and Newry Station. In 2009, Simone graduated with a Bachelor of Agribusiness from the University of New England. Over the years, Min followed her passion into a number of roles including managing the Charles Darwin University Katherine Campus Brahman stud, Technical Officer at Victoria River Research Station and for last four and a half years as a Biosecurity Officer for Department of Primary Industries and Regional Development in Kununurra Western Australia. As a Biosecurity officer in Kununurra Simone has acquired extensive knowledge in disease surveillance, protocols for cattle travelling across the Western Australia and Northern Territory border and livestock inspections.

Figure 21. Simone (Min) Andrews

Min looks forward to learning new tasks and expanding her knowledge in the beef industry.

Livestock disease investigations

The department provides a free disease investigation service, including free diagnostic testing through the Berrimah Veterinary Laboratory, to livestock owners for diagnosis or exclusion of notifiable emergency, exotic and endemic disease, including zoonotic diseases. Subsidies are available for producers to contact private veterinarians for significant disease investigations in livestock.

Subsidies for disease investigation

- Subsidies of up to $2,000 are available for disease investigations in cattle conducted by private vets until June 2019.
- For disease investigations in horses and other species, subsidies of up to $250 are available.
- Remember that $300 is available for cattle showing nervous signs where a post-mortem is performed and the brain collected for “Mad Cow” exclusion testing

Please contact your local vet or regional Livestock Biosecurity Officer for more information.

During October to December 2018, 74 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the NT.

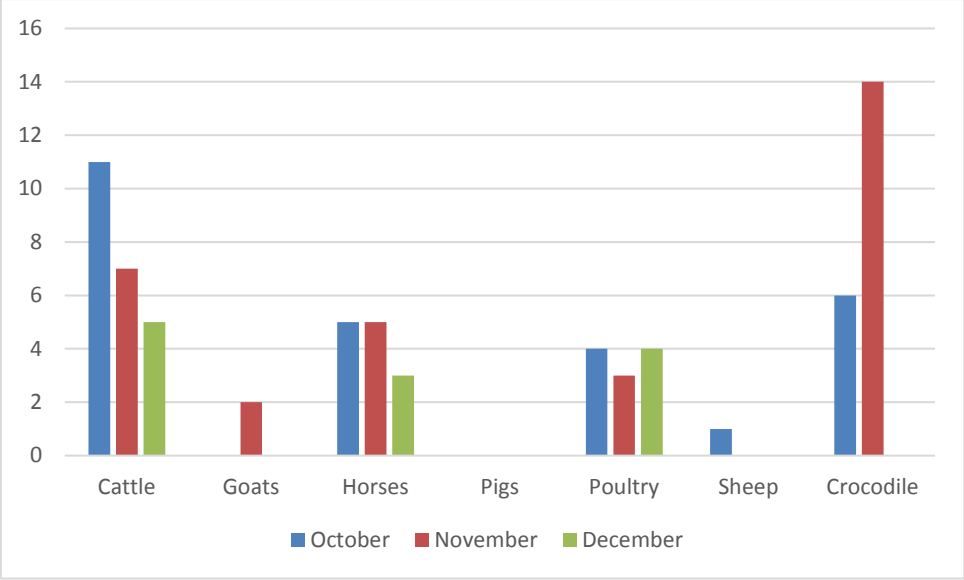


Figure 12. Livestock disease investigations in the NT, October to December 2018

E-Coli in pen feeding trial weaner

A weaner in a phosphorus pen feeding trial herd was noticed to be slow and swaying at a walk during weekly weighing of the animal group. The following day, the animal was off food, tucked up and depressed. A fever, together with nasal discharge and saliva drooling from the mouth were noted, with no visible damage to the nose, mouth or teeth. The breath smelled strongly of acetone, which is an indicator in ruminants of a negative energy crisis, and consequent formation of emergency energy supplies in the form of ketone bodies. The animal was treated symptomatically with electrolyte and fluid replacement and an anti-inflammatory injection; blood, throat and nasal swabs and faeces were submitted to Berrimah Veterinary Laboratory. However, the heifer was found dead the following morning.

On post mortem there was a strong smell of ketones throughout the carcass; ketoacidosis was suspected. One very small section of small intestine (< 5cm long) was severely inflamed (enteritis) without blockage or visible perforation. Another section of intestine contained what appeared to be a hair faecolith (also known as a hair concretion – a hard solid mass of hair). The kidneys and liver were friable to handle, tending to turn "mushy" when sections were cut in preparation for laboratory submission.

Laboratory examination of submitted tissues showed extensive necrosis (tissue death) and ulceration through the range of gastro-intestinal tissues submitted, with abundant bacteria in the walls of the gut tissues. Interestingly, lesions that were seen under the microscope were not limited to the section of small intestine that was seen to be inflamed with the naked eye. Septic thrombi (infected clots), indicative of widespread infection, were found in the spleen and kidney. The findings are consistent with severe bacterial enteritis (infection and subsequent changes to absorption through the intestinal wall) with spread of the causative organism throughout the body.

The clinical signs associated with this enteritis are consistent with infection by a subset of *E.coli* bacteria which produce Shiga toxins, causing severe illness in affected animals. Cattle are a recognised carrier of this bacteria, which is zoonotic, and a cause of haemorrhagic colitis (bloody diarrhoea) in humans. *E.coli* is capable of causing different disease syndromes in cattle, based on the specific toxins and virulence of the infecting strain. Enterotoxigenic strains typically cause disease in neonatal calves, while enterohaemorrhagic strains are associated with disease in older animals, as in this case. Disease tends to occur in isolated cases rather than herd outbreaks, as cattle carry the infective organism in the gastro-intestinal flora; a primary cause for the development of overwhelming infection was not identified in this case. No other animals in the pen trial were affected.

Tests on the blood confirmed ketoacidosis, which is likely secondary to the gastro-intestinal disease. A negative energy state in which ketone bodies are elevated can occur when carbohydrate reserves are depleted; in this case, this is a secondary effect following inappetance and depression. Changes in the liver were consistent with hepatic lipidosis, and are secondary changes consistent with ketoacidosis and severe debilitation.

These findings are interesting, as they highlight the fact that the clinical signs that can be seen (and in this case, smelled), may not in fact be the primary cause of disease or death. The results of laboratory testing also serve to emphasize the need to submit a range of tissue samples in order to reach a diagnosis; in this case, microscopic examination of the gut samples demonstrated severe disease that was not visible to the naked eye and would otherwise be missed.

Milk Fever

A property owner in the Darwin region reported two downer cows out of a herd of 12 *Bos taurus* cattle. The cows had been on the property for a few years, and there had been no recent management changes. The cows had had access to a bull. There was no supplement lick and there had been a number of recent storms. A cow was seen to be acting unusually, before being found down and then dead the next day. When a second cow was found down the regional Veterinary Officer and Livestock Biosecurity Officer were called to investigate.

On examination the cow was unable to move the legs or tail, and there was no deep pain response. There were no obvious signs of calving or trauma and the cow had a fever (40.2C). There were normal cow pats near the cow and no signs of struggling. The cow was euthanased for post mortem examination. Post mortem showed the cow to be in late pregnancy. There was significant bruising in the muscles and other tissue, the urine was dark and the kidneys enlarged. The calf was a bull calf, and the liver broke up more easily than expected. A range of samples were taken for lab testing, which showed low calcium (hypocalcaemia), muscle damage and breakdown of the liver.

Based on the findings of the post mortem and the samples collected, a diagnosis of milk fever was made. Milk fever is uncommon in the NT, and is generally associated with dairy cattle that produce a large quantity of milk; however, it can also occur in beef cattle. Milk fever is caused by low calcium in the blood; this causes a decrease in muscle function which can result in weakness, recumbency, depression and ultimately death. Pasture usually contains enough calcium to meet the minimal requirements of cattle, however a dramatic increase in calcium requirements occurs with the onset of lactation in the cow.

For this small managed herd the following recommendations were given and no further losses were reported:

- After joining, keep cows on a low calcium diet (ie. high in roughage and low in green feed) and make sure they don't become over fat.
- In the few weeks prior to calving, keep cows in a close paddock and observe them frequently. If down cows are noted and milk fever is suspected, consider administering a 3 in 1 or 4 in 1 vaccine treatment and contact a vet.
- Consider shortening the joining period so that approximate calving dates are known. This will make it easier to manage feeding and observation close to calving.

Tick Fever

Cattle ticks transmit organisms that cause tick fever, commonly known as 'red water' in cattle. Tick fever can result in loss of condition, mortalities, abortions and reduction in bull fertility. There are three types of tick fever organisms, *Babesia bovis*, *Babesia bigemina* and *Anaplasma marginale*.

Cattle that have been exposed to cattle tick at a young age build up lifelong immunity to these organisms, however, cattle from the tick free area that have never been exposed to cattle ticks will not have immunity. Cattle from the tick free area will require tick fever vaccination before moving in to a cattle tick infected area.

Clinical signs of tick fever

Signs of tick fever include:

- weakness
- depression
- sudden development of fever - temperature around 41° C (106° F). The fever stage usually lasts about a week.
- loss of appetite and rumination (chewing of cud) ceases
- The animal isolates itself from the herd; it is disinclined to move and stands with the head lowered and ears drooping.
- The coat may appear ruffled, breathing becomes rapid and jerky and heart beat is accelerated.
- The mucous membranes of the eyes, nose and mouth become yellow due to anaemia and jaundice.
- The animal exhibits incoordination of the hindquarters, muscle shivering and a tendency to charge when disturbed.
- Emaciation occurs.
- The animal passes red coloured urine.

Note: Most deaths occur in the third week, but may occur any time after 24 hours of infection. Death may be precipitated by exertion or excitement.

Despite the common name 'red water', red urine is only occasionally present and is seen late in the course of the disease. Cattle with *Babesia bovis* infections may be quite sick even if they do not show signs of anaemia and red urine.

Diagnosing tick fever

Tick fever is difficult to diagnose based on clinical signs alone. The best way to diagnose tick fever is through laboratory examination of blood smears.

Risk factors for tick fever

Breed

British and other *Bos taurus* cattle breeds are more susceptible to tick fever caused by *Babesia* organisms than Brahman (*Bos indicus)* breeds. Cross breeds (*Bos taurus* x *Bos indicus*) have intermediate susceptibility which will vary depending on the percentage of each breed type.

Both *Bos indicus* and *Bos taurus* breeds are highly susceptible to disease caused by *Anaplasma marginale*.

Age

There is a strong link between age and resistance with most outbreaks occurring in animals 18 to 36 months of age. Calves exposed to tick fever organisms between three to nine months of age rarely show clinical signs and develop a solid, long-lasting immunity.

Exposure

Cattle born and raised in areas where cattle ticks are endemic can develop natural immunity through exposure to ticks infected with tick fever.

However, exposure of calves to ticks infected with tick fever (and subsequent development of protective immunity) can be highly unpredictable. Exposure is influenced by factors such as breed, season and tick-control strategies.

Cattle from tick free areas should not be introduced into cattle tick infected areas without first receiving a tick fever vaccination. Ideally cattle will be vaccinated prior to nine months of age so they are set for later in life. The second best option is to ensure that cattle have been vaccinated at least two months prior to departure from tick free area to ensure that immunity has developed. If cattle need to be moved shortly after vaccination they should be moved either before day seven, or between days 21 to 30 after vaccination. This provides the less stress during the animals' peak reaction times.

Treatment

There are two types of tick fever vaccination, chilled trivalent vaccine and frozen trivalent vaccine. The more commonly used chilled trivalent vaccine is a live vaccine that contains strains of three tick fever parasites (*Babesia bovis*, *Babesia bigemina* and *Anaplasma marginale*). The frozen vaccine, also known as Combavac 3 in 1, is used in remote areas where it is not possible to get chilled vaccine delivered by the following day, or for properties where vaccine is needed to be kept on hand.

If used as directed, one dose of the live vaccines should provide lifelong immunity against all three parasites. The organisms in the vaccine multiply once injected in to the cattle, as would occur in a real life infection. The organisms in the vaccine are less infectious, allowing for immunity to develop without mortalities or serious production losses.

Ordering the vaccine

You can order vaccine directly from the Tick Fever Centre, through your local veterinarian or rural agency.

Chilled vaccine: Chilled vaccine is only produced on Tuesdays and Thursdays. Orders are not accepted on the day of dispatch but must be in by 4pm the day prior (Monday or Thursday) to production.

Frozen vaccine: Frozen vaccine is dispatched on Fridays, so orders must be received by 4pm on Wednesday.

References

Business Queensland 2016, *Tick Fever Vaccines for cattle*, Queensland Government, accessed 1 February 2019 <https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/livestock/cattle/tick-fever-vaccines >

Department of Primary Industry and Resources 2016, *AgNote: Tick Fevers of Cattle*, Northern Territory Governments, accessed 19 February 2019 <https://dpir.nt.gov.au/__data/assets/pdf_file/0010/233488/713.pdf>

NT WAYBILL – *28 DAYS*

OBLIGATIONS OF THE OWNER OF THE LIVESTOCK

1. A copy of the waybill *must* be forwarded to the Department *within 28 days* after the date on which the waybill was issued.

2. The owner *must* retain a copy of the waybill for at least 7 Years.

3. At the request of an Inspector during that period - the owner *must* produce the copy to the inspector.

NLIS REPORTING – *48 HOURS*

NLIS REPORTING OBLIGATIONS FOR THE OWNER OF PROPERTY OF DESTINATION

1. The owner of the destination property *must* ensure the NLIS transfer is entered on the NLIS database *within 48 hours* after the movement is completed .

If you are unsure or have any questions on any aspect of meeting your compliance obligations please contact your local livestock biosecurity officer.

NORTHERN TERRITORY GOVERNMENT

Post mortem and disease investigation workshop

Veterinary officers Megan Pickering and Elizabeth Stedman from the Livestock Biosecurity Branch, delivered an interactive post mortem and disease investigation workshop for cattle producers in the Katherine Region. Hosted by the Riggs family at Lakefield Station on a blisteringly hot December day, the 24 participants eagerly engaged in the hands-on experience of sample collection and preservation in the field.

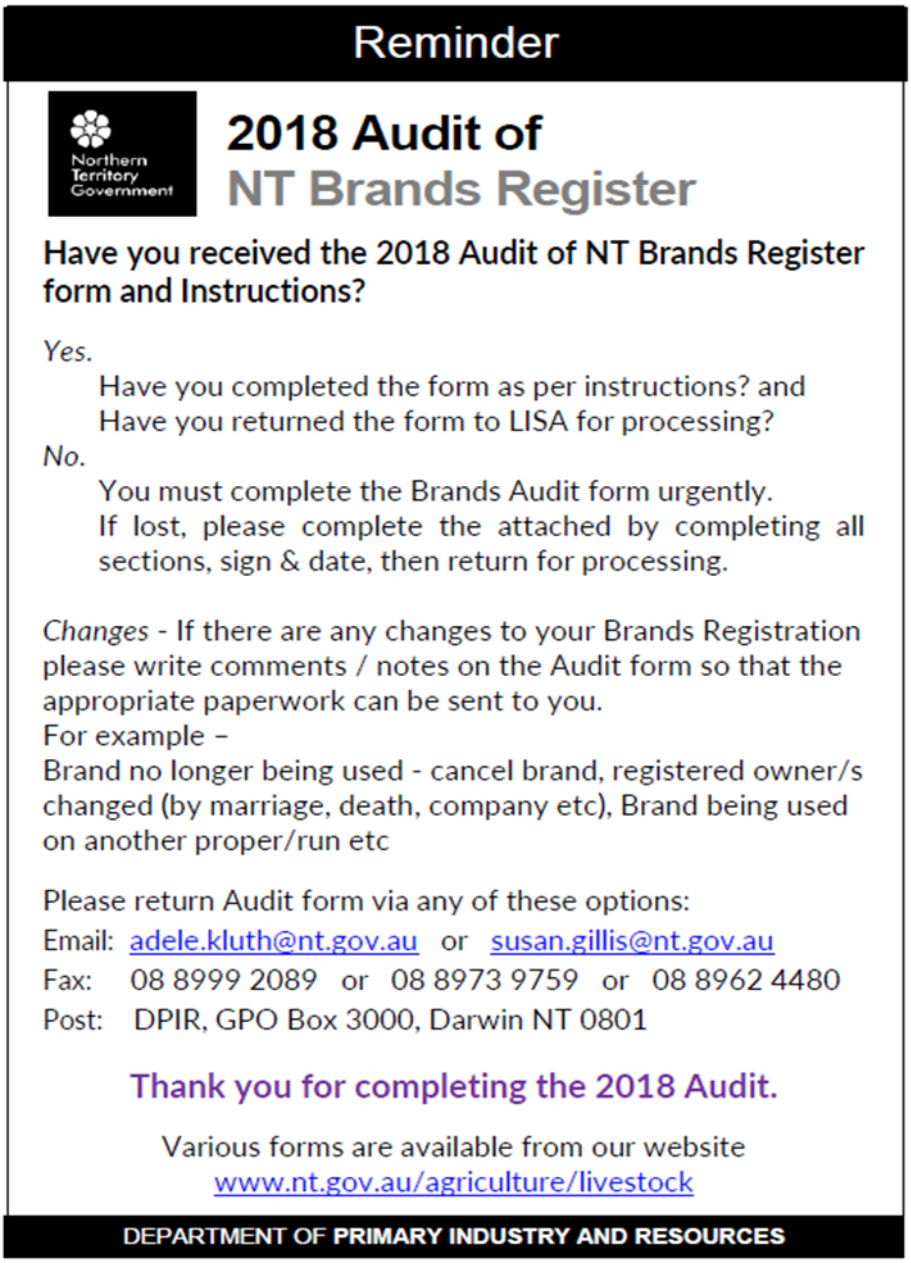
Commencing with a theory session, the workshop covered potential biosecurity threats to Australian pastoral industries, the various mechanisms in place to protect livestock, the response systems and combined government/industry approaches that would be taken in the case of an exotic or emergency animal disease incursion, and the role of the producer in on-farm biosecurity and early disease detection and reporting. Extreme climatic conditions and extensive grazing practices in northern Australia pose significant challenges to effective disease investigation options, and the option for producers to collect meaningful samples in the early phases of a disease outbreak was welcomed.

Two complete post mortems were then undertaken, where the practical aspects of tissue sampling were discussed around issues such as appropriate sample size, how to recognise normal versus abnormal tissues, tips and tricks on tissue handling to avoid excessive tissue damage or disruption in sample collection, and how to store, pack and dispatch both fresh and preserved tissues from the field.

At the conclusion of the workshop, participants from each station were presented with a sample collection kit. It is envisaged that such training will encourage and enable producers to confidently collect diagnostically meaningful samples in the early stages of a disease outbreak, which is a key factor in Northern Territory and Australian biosecurity preparedness strategies.

Figure 23: Field Veterinary Officer Megan Pickering providing post mortem training

This workshop was funded by the Northern Australia Biosecurity Surveillance project through funding from the Australian Government Agricultural Competitiveness White Paper. The project is a collaboration between the Commonwealth and Queensland, Western Australia and Northern Territory Departments of Agriculture and Animal Health Australia.



Where there is swill, there is a way

Pig owners are reminded that feeding pigs meat scraps poses a serious risk to Australian biosecurity as African Swine Fever (ASF) spreads through China, South East Asia and Eastern Europe.

It is illegal in every Australian state and territory to feed swill to pigs. Swill is the name for meat products or products that have come into contact with meat. Examples of swill include:

- pies and pasties
- sausage rolls
- pizza
- table scraps
- restaurant leftovers
- discarded cooking oils.

* Non-Australian dairy products are also banned.

Feeding swill to pigs is one of the simplest ways that serious diseases can enter the food chain.

ASF, a highly contagious viral disease of pigs, is currently spreading throughout China. It can cause up to 95% mortality in affected pigs, and has the potential to severely threaten the Australian pork industry. The virus survives at a wide range of pH levels, is resistant to most disinfectants and remains active in meat products through freezing and thawing.

ASF does not pose a risk to human health.

If you notice any suspicious symptoms in your pigs, such as weakness, lethargy, reduced appetite, discharge and blotchy skin lesions, please contact the Exotic Animal Disease Hotline on 1800 675 888.

Contact the Livestock Biosecurity team

Darwin		**Katherine**	
Regional Livestock Biosecurity Officer	08 8999 2034	Regional Livestock Biosecurity Officer	08 8973 9767
Livestock Biosecurity Officer	08 8999 2030	Livestock Biosecurity Officer	08 8973 9765
Tennant Creek		**Alice Springs**	
Principal Livestock Biosecurity Officer	08 8962 4458	Senior Field Veterinary Officer	08 8951 8181
Livestock Biosecurity Officer	08 8962 4492	Regional Livestock Biosecurity Officer	08 8951 8125

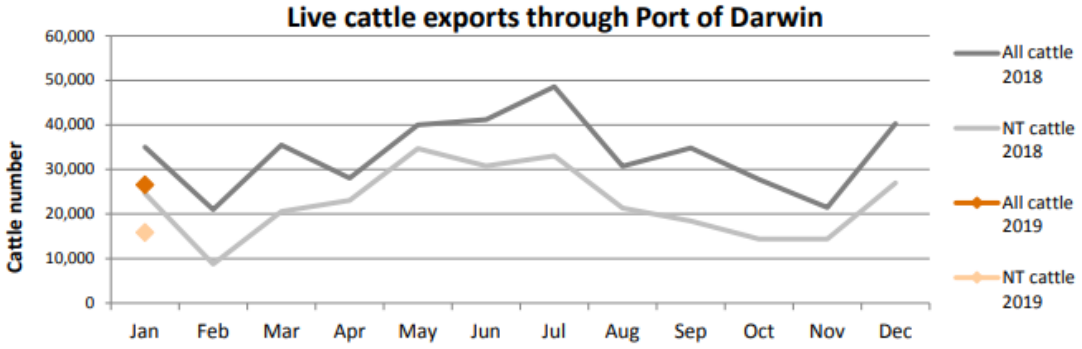
Department website: nt.gov.au/industry/agriculture/livestock

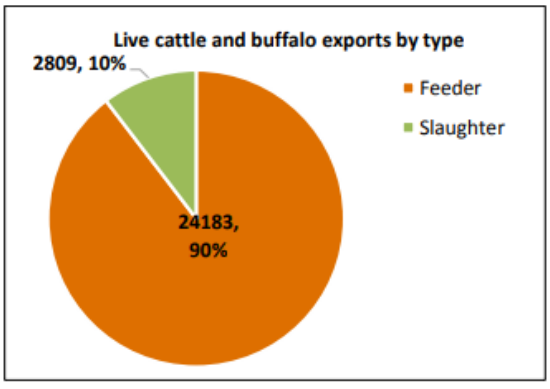
Pastoral Market Update

Live Exports via Darwin Port – JANUARY 2019

Please note: figures are for stock exported through the Port of Darwin only; some NT stock are exported through interstate ports
Please note: the NT Cattle figures here have been rounded respectively and may not tally to totals.
The figures listed below are correct as at January 31 2019 and are subject to change as further data becomes available.

Destination	Export of ALL CATTLE (including interstate)							Export of NT CATTLE (estimate only)						
	2017	2018	Last year to 31/01/18	YTD to 31/12/19	Jan	Last month	*Difference*	2017	2018	Last year to 31/01/18	YTD to 31/12/19	Jan	Last month	*Difference*
Brunei	3,872	3,653	0	0	0	0	0	2,423	2,292	0	0	0	0	0
Indonesia	245,544	324,856	32,159	21,241	21,241	33,723	-12,482	150,489	215,353	22,640	12,657	12,657	22,591	-9,934
Philippines	0	10,482	0	0	0	0	0	0	7,262	0	0	0	0	0
Sabah	2,640	0	0	0	0	0	0	1,680	0	0	0	0	0	0
Sarawak	2,743	2,106	0	0	0	996	-996	1,594	1,631	0	0	0	667	-667
Malaysia	13,257	11,813	0	0	0	0	0	8,109	7,848	0	0	0	0	0
Vietnam	39,989	49,771	2,830	5,338	5,338	4,672	666	25,884	35,342	1,992	3,181	3,181	3,130	51
Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thailand	800	1,720	0	0	0	920	-920	535	1,274	0	0	0	616	-616
Cambodia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	308,845	404,401	34,989	26,579	26,579	40,311	-13,732	190,715	271,001	24,632	15,837	15,837	27,004	-11,167





OTHER LIVESTOCK

Destination	Buffalo		Goat		Camel	
	YTD	Jan	YTD	Jan	YTD	Jan
Brunei	0	0	0	0	0	0
Indonesia	167	167	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	246	246	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	413	413	0	0	0	0

LIVESTOCK MOVEMENT STATISTICS

Reports for livestock movements from NT to Interstate, within NT and Interstate to NT are updated biannually - see www.dpir.nt.gov.au/primary-industry/primary-industry-strategies-projects-and-research/livestock-movement-statistics

Total of ALL CATTLE through Port of Darwin							Total of NT CATTLE through Port of Darwin						
2012	2013	2014	2015	2016	2017	2018	2012	2013	2014	2015	2016	2017	2018
246,990	359,616	493,958	510,860	372,251	308,845	404,401	234,249	308,784	324,477	295,738	236,511	190,715	271,001

Subscribe or unsubscribe to the monthly Pastoral Market Update.

Katherine region events calendar

Event	Location	Date	
NTCA Conference	Darwin	28-29 March 2019	https://www.ntca.org.au/conferences/2019-ntca-conference
Climate variability and grazing risk management workshop	Katherine	5th April 2019	annemarie.huey@usq.edu.au
Pathways to potential field day	Katherine Research Station	9th April 2019	joy.sherlock@nt.gov.au
Pathways to potential field day	Douglas Daly Research Farm	10th April 2019	joy.sherlock@nt.gov.au

Please email us with updates of events happening in your area: krs.dpir@nt.gov.au

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