

# Top Paddock

DEPARTMENT OF PRIMARY INDUSTRY AND FISHERIES



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## Message from the Editor

Our dry hot humid Wet Season is currently being followed up by a wet hot humid Dry Season. Hopefully cool weather is on its way, not just for the relief of the populace, but to aid mango flowering to set a crop for later this year.

The late rain has affected the quality of some hay crops and delayed the harvest of others. Now is a good time for producers with livestock to check their standing feed resource and water supply, as both may become limiting if we have a long Dry Season this year.

Developing the North is currently high on the agenda. The successful Northern Australian Food Futures Conference held in Darwin during April is being followed up by the annual Developing Northern Australia Conference this month. The title of the conference is "Above the Line - unleashing the north's potential". Based on the "Top Actions Summary" identified in the Australian Government's White Paper on Developing Northern Australia, this conference will explore how industry, business, government and agribusiness are embracing the opportunities for sustainable growth into the next decade.

Cheers,

Arthur



*The 2016 Northern Australia Food Futures Conference held in April at the Darwin Convention Centre was a great success*

## Northern Australia Food Futures Conference

The NT Farmers Association held a successful Northern Australia Food Futures Conference with the theme “Investing in the Future of Agriculture in the North” in Darwin between 11 and 13 April this year.

The Food Futures Conference led the debate in enabling effective policy action to maximise agricultural development in Northern Australia. The conference focused on how development can be achieved by creating an environment where a wide array of stakeholders are brought together and encouraged to learn about and tackle the issues for positive growth across Northern Australia.

The conference was attended by a number of federal and state ministers, including The Honourable Gary Higgins MLA, Minister for Primary Industry and Fisheries, along with government officers, bankers, business, agribusiness, producers and representatives of producer bodies.

Speaker’s topics included:

- Senator Matt Canavan, the Federal Minister for Northern Australia – ‘The case for northern development: perspectives of the Australian Government’
- Brian Wilson, the Chairman of the Foreign Investment Review Board – ‘Foreign Investment Review Board update’
- Jim Engelke, Kimberley Agricultural Investments – ‘Making foreign investment work on the ground’
- David Williams of Kidder Williams, specialists in agri-sector investments – ‘Investor’s perspective of agri-investments’
- The Honourable Mia Davies, Minister for Water (WA) – ‘Water for food’

Panel session topics included:

- What do investors want? Making new investments work (the commercial realities of agricultural investments)
- Crop economics (where the opportunities might be within crops and regions)
- Crop systems (cropping systems for successful developments)
- Logistics and supply chains (insights and understanding about moving product to markets)
- A perspective from the top (by the three northern agriculture ministers)
- Human capital for development (the role of R&D in developing a successful industry)
- Working with the pastoral sector (farming on pastoral properties is advancing)
- Greenfield developments
- Public models for development
- What our leaders think (Senator Anne Ruston, Assistant Minister for Agriculture and Water, and Joel Fitzgibbon MP Shadow Minister for Agriculture)

- Land tenure (new thinking around land tenure)
- Water (the balance between water, environment and development)

The take home messages were:

1. That the winning formula combines local expertise, foreign expertise, foreign investment and a route to market.
2. Land tenure is no longer an impediment to development. There are innovative ways to remove land tenure as an issue.
3. Investors need water security into the future over a long time scale. There are concerns about the effects of policy and climate on this.



Arthur Cameron (NTG), Annette Duncan (NTG), Linda Bennison (Soil Science Australia and Australian Society of Agronomy) and Bob Williams (NTG) sharing a drink at the conference welcome reception hosted by the Hon. Gary Higgins, Minister for Primary Industry and Fisheries



Plant Industries Development officers Ian Biggs, Mila Bristow and Callen Thompson at the welcome reception

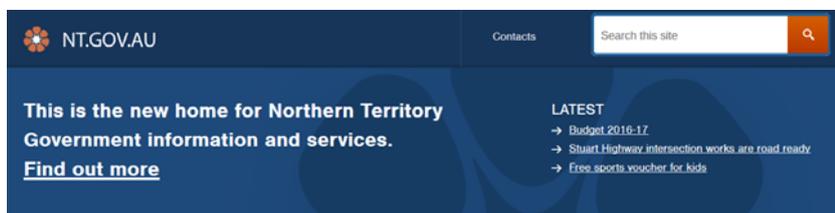


NTG officers Tania Moloney, Jason Hill and Mila Bristow discussed northern development with conference delegates at the NTG conference display

# NT Government website: new and improved

Chelsea Moore, Industry Development Officer, Darwin

The Northern Territory Government launched a new whole-of-government website in April 2016. The [nt.gov.au](http://nt.gov.au) site merges previous department sites into one site, organised by content instead of corporate structure.



The new look for the NT Government website at [nt.gov.au](http://nt.gov.au)

Information is easier to find and understand.

Jam-packed with new features, the search function has been enhanced, the information is written in plain English and it is user friendly for mobile phones and tablets.

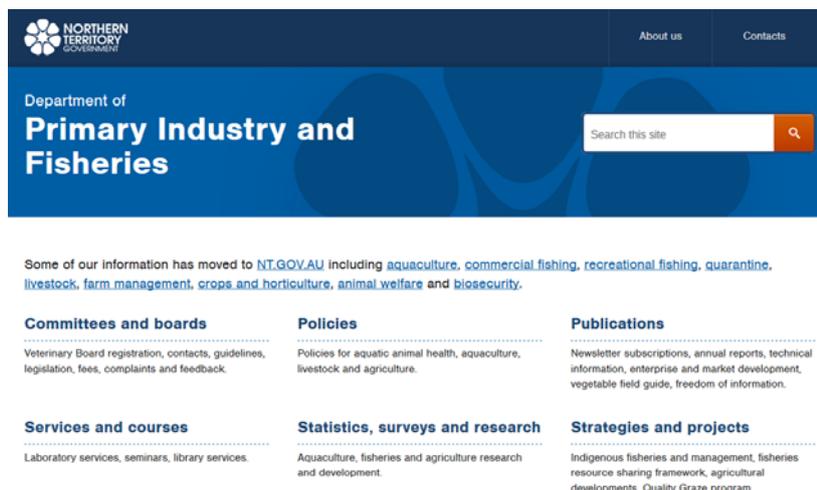
Agricultural information can be found in this section:

<https://nt.gov.au/industry/agriculture>

While all of the grower information is now housed on the NT.GOV.AU website, the department still maintains a separate page for information such as new research, policies, committees and courses:

<https://dpif.nt.gov.au/>

The Department of Primary Industry and Fisheries still maintains a separate website that also follows the new look, at [dpif.nt.gov.au](http://dpif.nt.gov.au)





## Cool season growth of Tropical Grasses Field Day

You're invited to come along to our Field Day to discuss the production of irrigated tropical grasses and to inspect the trial.

- Where:** Coastal Plains Research Station  
Anzac Parade, Middle Point
- When:** Wednesday 6 July 2016
- Time:** 10:00 – 11:30am  
Morning tea provided
- RSVP:** By 1 July  
Arthur Cameron 89992214 or 0417816795  
arthur.cameron@nt.gov.au

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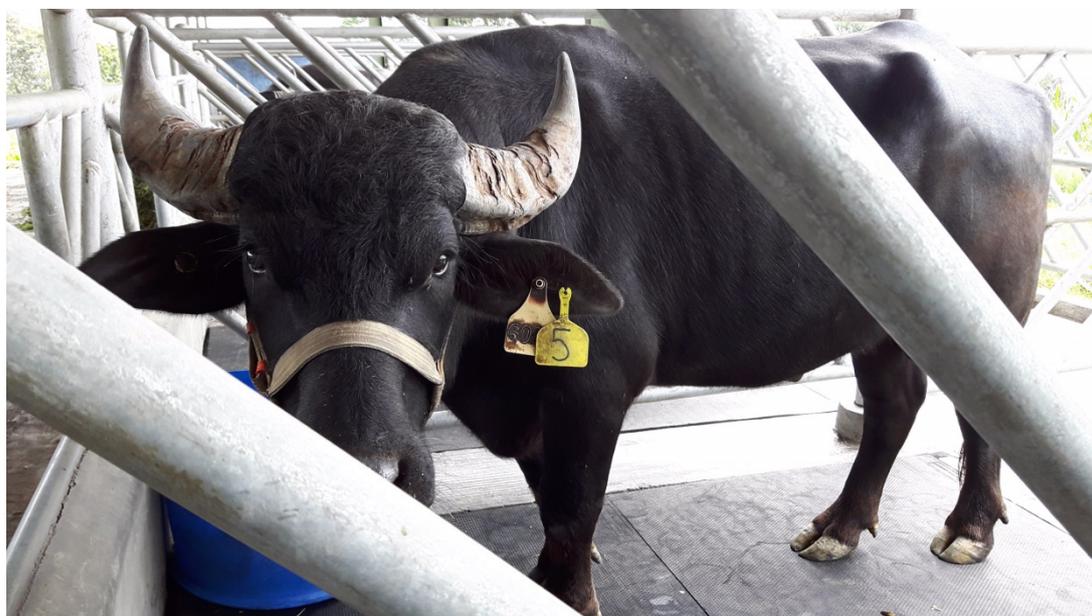
## NT DPIF Minister gifts four buffalo bulls to Indonesian Government artificial insemination centres

Barry Lemcke, Principal Livestock Management Officer, Darwin

In December 2015, four purebred riverine buffalo bulls from Beatrice Hill Research Farm were shipped to the Lembang artificial insemination (AI) centre to the east of Jakarta, courtesy of the Northern Territory Live Exporters Association and the North Australian Cattle Company. They arrived in Jakarta on the MV Bison Express on 14 December.

It was the culmination of more than 12 months of preparation for six bulls before the final import permits were available and four were selected to depart for Indonesia.

I was able to inspect the quarantine yard facilities two days in advance to make sure that their arrival was fully planned. Some modifications were necessary for unloading and security. Their off-loading at 2am in Lembang went very smoothly after a four hour 150km journey which luckily dodged the peak hour traffic congestion.



*One of the four Darwin Riverine buffalo bulls sent to the Lembang AI centre*

The bulls weren't in great condition on arrival as they hadn't put on any weight in quarantine in the export yards in Darwin following a prolonged Dry Season. They also didn't eat much of their boat ration on the four day journey to Indonesia.

The green chop corn and concentrate offered on arrival was hardly eaten overnight. As the quarantine yard was surrounded with a magnificent crop of Napier (elephant) grass, stalks were chopped and offered to the bulls. All bulls ravishingly accepted the offering. This feed was continued for the next few days, with the green-chop and concentrate introduced slowly, once they were fully adapted to their new surroundings.



*Riverine buffalo feeding on Napier grass in the quarantine yard*

A visit to the Lembang AI centre to see the 196 animals housed there was enough to realise that they would be well looked after. All bulls there were in excellent condition. The facility also catered for goats and sheep. The four buffalo bulls already in residence were a Riverine (Murrah) and three Swamp buffalo.

The AI straw processing equipment was modern and efficient at processing large quantities of straws and plenty of liquid nitrogen storage space was available. The cost of straws was also reasonable to local farmers in comparison to Australian standards.

The Lembang area is quite elevated so the climate was mild and pleasant in comparison with Jakarta or Darwin. The final destination for 2 of the bulls is the Singosari AI Centre in the far eastern end of the island of Java. Lembang is on the western end of Java.

The reason for the gifting was to demonstrate the impact that Riverine buffalo might play in the self-sufficiency aspirations of the Indonesian Government, for both their meat and dairy industries. Because the bulk of Indonesian buffalo are the Swamp type, there would be great scope for increasing productivity of their herds by crossbreeding the Riverine with their Swamp animals to gain the 40% production advantage that we gained in the NT from the introduction of Riverine buffalo during 1994-97. Once this has been demonstrated, it will be expected to stimulate the export to Indonesia of more buffalo breeding stock from the NT.



*The MV Bison Express arriving in Jakarta, Indonesia*

## Magpie geese damage to mango crops

Warren Hunt, Agricultural Policy and Analysis Officer, Darwin

Magpie geese are a growing problem in mango orchards in the Darwin region. Observations by two sizeable mango businesses indicate crop losses between 10-15%. If this level of damage is consistent through much of the Darwin mango production region, the impact could be worth up to \$2 million per annum. A new initiative between the NT Government, NT Farmers Association (NTFA), Charles Darwin University (CDU) and Horticulture Innovation Australia (HIA) aims to find a long-term solution to this problem. The project, funded by members' mango levies to HIA, involves a CDU PhD study to investigate the behavioural patterns of the birds and investigate the efficacy of a number of novel damage mitigation techniques.



*Typical damage to mango fruit by magpie geese*



Research is necessary to establish the extent of the problem and determine potential mitigation strategies that may be essential for ensuring the Darwin region maintains a profitable mango industry in coming decades, without detrimentally affecting magpie geese populations. Mango farmers, Parks and Wildlife Commission of the NT and the Department of Land Resource Management (DLRM) experts believe that the behaviour of magpie geese in recent years may be altering. This could be resulting in geese causing increased early damage and in some cases even becoming resident in orchards.

Project activities commenced with a growers' consultation meeting in April at Acacia Hills Farm that was attended by over 40 farmers and services sector providers. A project advisory committee has been formed to provide guidance to the research team and comprises growers, HIA, CDU, AMIA, NTFA, DLRM and Department of Primary Industry and Fisheries (DPIF) representatives.



*Magpie goose*

Additionally, Top End mango producer and NTFA/AMIA Board member Han Siah won a Nuffield Scholarship to investigate novel control techniques for protecting horticultural crops from bird damage in the Top End. Mr Siah's new information may provide ideas that could inform the project about novel control techniques for testing in mangoes and other horticultural crops.

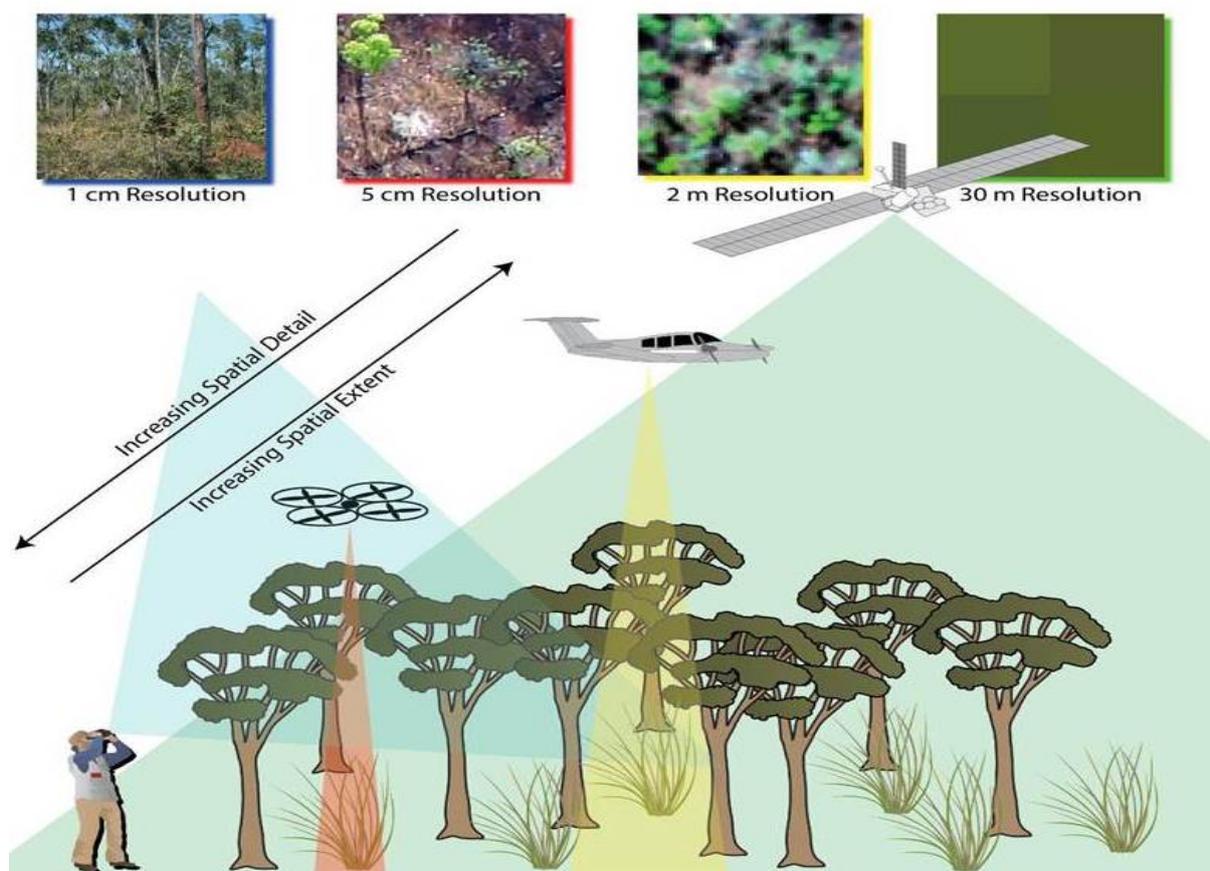
# Eye in the sky: potential use of unmanned aerial system for research and extension in the Top End

Callen Thompson, Senior Extension Agronomist, Katherine and Constancio Asis, Senior Research Agronomist, Berrimah

Unmanned aerial systems (UAS) technology and remote sensors are improving at a rapid rate. We attended a conference on Unmanned Aircraft for Remote Sensing Applications (UAS4RS) at the University of Queensland, Brisbane on 17-18 February. Our aims were to look at ways other researchers used this technology and to work out potential benefits remote sensing from UAS offers to our current and future research and extension. The conference's presentations and discussion focused on the applications of UAS in challenging environmental situations including inaccessible terrain, vast areas, tundra, desert, and over oceans.

## Why use UAS?

We have many options to capture data. Field surveys involve sampling and monitoring but these are time consuming and focus only on small areas. Satellites are great at covering large areas; but they have low resolution and are affected by cloud cover. Aircraft cover large areas quickly but are expensive, affected by cloud cover and known to have risk on personal safety. UAS collect high resolution data on demand at a lower cost, are not affected by high cloud cover, and can easily get to areas inaccessible to researchers. Thus, UAS provide a link in multi-scale integration of plot-based field surveys with high-flying manned aircraft and earth-observing satellites. Dr Karen Joyce from James Cook University discussed the difference in resolution from each of these methods (Figure 1, below).



*Difference in spatial detail and extent of remote sensing technology*

## DPIF's potential use of UAS

UAS is a promising tool in remote sensing of forest dynamics, pest and biosecurity threats, as well as monitoring coastal, aquatic, and agricultural ecosystems. Using multi-spectral cameras, UAS capture different image bands for use in presentation of true colour, near infrared or normalised difference vegetation index (NDVI), an indicator of crop biomass, health and available nitrogen. High resolution imagery over large areas allows monitoring of changes in population, density and ground cover as well as identification of pests in horticultural crops and forestry. This data can be fed into Precision Ag software to create paddock-based management systems.

### Selecting UAS, sensors and camera

UAS can be fixed wing or multi-rotor. Fixed wing UAS are suited to flying long distances while multi-rotor UAS are suitable in areas where there is less space to take off and land. Selecting the appropriate sensor dictates the payload and gimbal setup needed. The MicaSense RedEdge sensor is a widely used multispectral camera while the DJI Phantom with a Go Pro modified for NDVI is the package of choice for many advisers and agronomists.



SenseFly eBee



Octocopter

*Fixed wing and multi-rotor UAS*



MicaSense RedEdge



DJI Phantom with Go Pro

*Sensor and multi-spectral cameras*

## Challenges

Flying UAS legally is currently the biggest limitation as anybody using a UAS must be licenced. Managing and processing data is a big issue as UAS collect massive amounts of data. Short flight time is still a challenge, even though batteries are improving rapidly. Sensors are large and running with more than one sensor is necessary to avoid the issue of co-registering data. But greater payload results in less flight time. We would also need more than one UAS unit because they are susceptible to crashing and being attacked by eagles. A spare unit is also important in case of system malfunctions, particularly in the harsh NT environment.

## Moving forward

Attending the conference was extremely worthwhile. It gave us an understanding of where current technology is and where it is heading. It was good to see how our colleagues are using remote sensing technology both in research and extension. It was also great to meet and network with staff from various state departments and universities from Australia and overseas. For NT DPIF to move forward in this field, we need to work with organisations that are already using the technology, have access to software and hardware, and are licenced to fly. Through this process we can develop the capacity of our own staff.

Access the proceedings of the conference at:

<http://conf2016.uas4rs.org.au/proceedings/>



*Han Shiong Siah, agronomist and farm manager for Tropical Primary Products in Lambells Lagoon, discusses his family-owned and operated tropical fruit production business*

## **PID staff host ACIAR project collaborators**

### **Constancio Asis, Senior Research Agronomist, Berrimah**

Senior Horticulturist Mark Hault and Senior Technical Officer Mark Traynor from the NT Department of Primary Industry and Fisheries Plant Industries Development (PID) unit recently hosted research collaborators working on the project 'Tropical Tree Fruit Research and Development' in the Philippines and Northern Australia. The project is funded by Australian Centre for Integrated Agricultural Research (ACIAR). Filipino researchers Dr Francisco Dayap and Dr Dario Lina observed best practices for Australian fruit production systems from the nursery to the field at Berrimah Research Farm and Coastal Plains Research Farm. They also visited several commercial orchards and spoke with fruit growers in the Northern Territory. They were accompanied by former DPIF staffer Yan Diczbalis, now the Principal Horticulturist for the Department of Agriculture and Fisheries, Queensland, and Dr David Hall, a consultant for the project.

Dr Dayap is a researcher from the Department of Agriculture in the Philippines. He leads the nursery and nutrient management component of the ACIAR project. Also from the Philippines is Dr Lina, an associate professor with Visayas State University where he leads the nutrient management and flower regulation component.

The visit was funded by NT and Queensland committees for The Crawford Fund and ACIAR. Time spent in the NT will help the researchers develop an understanding of disease management practices, nutrition budgeting, fertiliser management and flower regulation techniques used in tropical tree fruit production in Australia. They will also gain a better understanding of the relationships between various components of production and the impact of mismanagement in one area on the entire production chain.

The ACIAR project aims to improve the livelihood of smallholder tropical fruit farmers in the southern Philippines and enhance new fruit industry development in tropical Australia. This includes developing and implementing integrated disease management programs in jackfruit and improving crop management to increase jackfruit productivity and quality in the Philippines and other tropical fruits in northern Australia. It also aims to develop improved processing applications for jackfruit and lychee.



*Dr Francisco Dayap, Dr Dario Lina, Mark Hault, Yan Diczbalis and Mark Traynor discussing jackfruit grafting at Berrimah Farm*



*Panoramic view of Alan Niscioli programming semi-automatic soil gas sampling chambers at a Darwin mango orchard*

## Greenhouse Gases in Agriculture Workshop

**Alan Niscioli, Senior Technical Officer, Darwin**

Greenhouse gas emissions, fertiliser management strategies and nitrogen use efficiency were the focus of discussion at the Kununurra Greenhouse Gases in Agriculture Workshop, held on 14 March at the Frank Wise Institute in Kununurra WA. The workshop was hosted by Living Farm, in partnership with the Northern Territory Department of Primary Industry and Fisheries (DPIF), Queensland University of Technology (QUT) and the Department of Agriculture and Food Western Australia (DAFWA). Guest speakers included Dr Andrew Wherrett from Living Farm, Dr David Rowlings from QUT and Dr Mila Bristow from DPIF.

Guest speakers presented findings from their various Action on The Ground (AOTG) projects being run across the north Australia which use national methods to quantify soil greenhouse gas emissions. These projects are funded by the Australian Government's Carbon Farming Futures Program.

Andrew discussed findings from his Kununurra trials where he examined the effects of fertiliser application on soil nitrous oxide ( $N_2O$ ) emissions from flood irrigated systems.  $N_2O$  is a powerful greenhouse gas 300 times more potent than carbon dioxide. Soil emissions are an indicator of nitrogen (N) losses after fertiliser application. Nitrogen can be lost in many ways, including leaching through the soil, through runoff and erosion, and as gases lost to the atmosphere. The latter can account for over 50% of N loss and occurs through volatilisation of ammonia or through the breakdown of nitrate by microbes into other forms such as  $N_2O$ .

Rate of soil  $N_2O$  emission are accelerated in the warm, wet soils of northern Australia, particularly in regions of intensive farming around Kununurra and horticultural regions around Darwin and Katherine. Although some  $N_2O$  emissions are unavoidable, farmers can reduce them.

In one of his trials Dr Wherrett demonstrated the effectiveness of a nitrification inhibitor called eNtrench™ in reducing  $N_2O$  emissions. The product is used with N based fertilisers and like other nitrification inhibitors it works by reducing the bacterial conversion of ammonium nitrogen to a nitrate form. In his trials he also demonstrated that in-furrow injection of fertiliser at seeding reduced volatilisation of fertiliser which can be high in surface and side dressed applications, both of which are common practices in the Ord.

In a three-year research trial in southern Queensland Dr Rowlings and his team examined the fate of fertiliser by using N labelled with short lived radioactive isotopes and then tracking them through soil and sorghum plants during the growing season. They found that 57% of the fertiliser N was recovered by the crop and from this recovered N they found that 75% was removed by the grain during harvest. This



*Manually collecting soil gas samples at a Darwin farm*

represents a fertiliser use efficiency (applied N removed in grain) of 44 - 45%. They also determined that 16% of the N fertiliser was left in the soil while 27 - 28% of N was lost to the atmosphere.

Dr Mila Bristow presented outcomes from the NT AOTG program. From 2012 to 2015 the DPIF conducted experiments examining the use of Wet Season cover crops to improve N management between crops and assessed the effectiveness of cover crops in mitigating N<sub>2</sub>O emissions during the Wet Season. Findings from the experiments suggest that soil greenhouse gas emissions are driven by rainfall and management events such as cultivation, rather than by the type of cover crop grown. Research found soils with cover crops store far greater whole plant and soil N than do bare soils, preventing losses through leaching. However, cover crops had little impact on residual soil N remaining after the Dry Season.



*A semi-automatic soil gas sampling system set up at a Darwin mango orchard. The solar panel and sampler unit are in the foreground, and the sampling chambers are under the mango trees*

Over the three years the NT research team also monitored emissions and N use in a range of Dry Season vegetable and melon crops. It was found that the majority of NT farmers apply fertilisers at recommended rates and their emissions currently rank in the lower range of emissions reported for other irrigated crops worldwide. However, there were some instances where emissions were high and could be improved.

The NT team also evaluated the effectiveness of enhanced efficiency fertilisers on pastures in the Katherine region. Results from these trials showed that greenhouse gas emissions from hay crop soils occur immediately after the application of fertilisers. They also showed that by switching from general products such as urea to an enhanced efficiency product such as Entec™, soil N<sub>2</sub>O emissions were reduced by 25 - 60% with no reduction in hay quality.



*A fully automated soil gas sampling chamber in a mango orchard after heavy rain. Darwin weather conditions can make gas sampling a challenge!*

The NT AOTG project has now shifted focus to mangoes and bananas where trials have begun in the Darwin region and the Ord region of WA. The team hopes to gain a better understanding of soil N<sub>2</sub>O emissions to improve N management in both mango and banana cropping systems. To complete this work the team will use automated monitoring equipment which will provide greater accuracy and provide a deeper understanding of the processes involved.



DPIF staff Cameron Hartley, Heika Oestreich and Amy Dobell at the Freds Pass Show

## Out and about at the Freds Pass Show

### Paige Richter, Technical Officer, Darwin

The Northern Territory show circuit kicked off last month with the Freds Pass Show held on 14 – 15 May. The Department of Primary Industry and Fisheries (DPIF) put on an impressive display showcasing the latest projects and information for interested showgoers.

The Livestock Industries Development unit had information on buffalo production and breeding programs, and the Marketing and Enterprise Development unit emphasised how agribusiness will be a main driver of development in northern Australia in coming years.

The Plant Industries Development unit had an update on the Cucumber Green Mottled Mosaic Virus outbreak and information on pests to watch out for in your veggie garden. They had a dried insect display and termites mounds which the crowd found extremely interesting. They also shared information encouraging pastoralists to take advantage of new diversification frameworks in order to protect themselves from financial instability and develop more sustainable farming practices.

The Animal Welfare Branch gave out Frisbee freebies for our furry friends and information on who to call to report animal abuse or neglect. As Territorians we love our animals and our wildlife and don't want to see them neglected or abused. Animal abuse, cruelty or abandonment can be reported to the Animal Welfare Branch on 1300 720 386.



Amy Dobell from the Plant Industries Development group tends to the garden



The insect display, featuring termite mounds, attracted a lot of attention



Fisheries contributed lots of interesting information

Fisheries focused on sustainable fishing by advertising their new fishing regulations, including revised possession limits and the creation of reef fish protection areas. They also encouraged showgoers to make use of the newly released free NT Fishing Mate smartphone software that has many features and can alert you if you are in a protected area when out on the water. There were project updates with information on their oyster farming initiative working with remote communities and information on protecting our waterways from feral fish species. Keep an eye out for new species and report any new pest sightings by taking a photo and calling the Fishwatch Hotline on 1800 891 136.

The Biosecurity division attracted attention with information on the requirement to have a Property Identification Code (PIC). You require a PIC if you house livestock on your residential or rural property. This will help biosecurity officers to monitor disease outbreaks and contact you quickly if there is an occurrence. Livestock includes cattle, buffalo, horses, donkeys, pigs, poultry, deer, llamas, camels, alpacas, sheep, goats and honeybees. It is free to apply for a PIC and can be done in a few minutes at:



The Biosecurity display was a popular talking point for showgoers

<https://nt.gov.au/industry/agriculture/livestock/get-a-property-identification-code/online-registration-form-nt-property-identification-code-pic>

There was also information on the Browsing Ant and Banana Freckle eradication programs. The latter has moved into the sentinel planting stage where you may now apply for a free permit to plant bananas in Red Zones, so long as they are purchased through an accredited nursery. These plants will be monitored for signs of Banana Freckle. Once you are issued a permit, you may even be offered sentinel plants for free. You can apply for a permit at:

[www.banana.nt.gov.au](http://www.banana.nt.gov.au)

The 2016 Freds Pass Show was another great success for the department and we look forward to the Alice Springs Show on 1 – 2 July.

# Pastoral Market Update

DEPARTMENT OF PRIMARY INDUSTRY AND FISHERIES



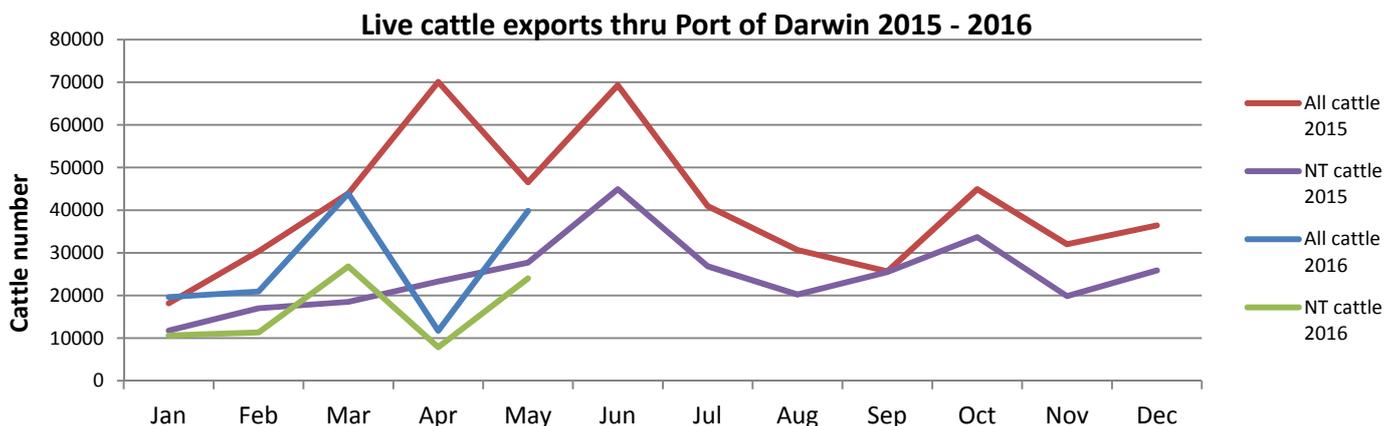
## Live Cattle Exports via Darwin Port – May 2016

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

Destination	Export of ALL CATTLE (including interstate) from Darwin Port							Export of NT CATTLE from Darwin Port (estimate only)						
	2014	2015	Last year to 31/05/15	YTD to 31/05/16	May	Last month	Difference	2014	2015	Last year to 31/05/15	YTD to 31/05/16	May	Last month	Difference
Brunei	4,925	4,122	1,029	1,999	1,099	0	1,099	4,925	2,069	0	1,212	663	0	663
Indonesia	386,183	341,759	158,465	114,189	32,228	8,812	23,416	251,232	197,155	72,463	67,385	19,433	5,904	13,529
Philippines	16,080	23,611	10,927	1,743	0	1,743	-1,743	11,221	13,559	4,545	1,168	0	1,168	-1,168
Sabah	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sarawak	0	300	300	0	0	0	0	0	0	0	0	0	0	0
Malaysia	22,309	11,503	1,470	3,700	2,895	0	2,895	15,708	7,499	932	2,237	1,746	0	1,746
Vietnam	64,461	100,119	34,612	14,380	3,593	1,165	2,428	41,391	63,998	19,189	8,552	2,167	781	1,386
Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thailand	0	6,154	2,305	0	0	0	0	0	3,610	1,097	0	0	0	0
<b>TOTAL</b>	<b>493,958</b>	<b>487,568</b>	<b>209,108</b>	<b>136,011</b>	<b>39,815</b>	<b>11,720</b>	<b>28,095</b>	<b>324,477</b>	<b>287,892</b>	<b>98,226</b>	<b>80,553</b>	<b>24,008</b>	<b>7,852</b>	<b>16,156</b>

### May at a glance

- 39,815 cattle through the Darwin Port during May; 28,095 more than last month and 6,735 less than during the month of May last year.
- 24,008 NT cattle through the Darwin Port during May; 16,156 more than last month and 3,680 less than during the month of May last year.



### OTHER LIVESTOCK EXPORTS VIA DARWIN PORT

Includes NT and interstate stock.

Destination	Buffalo		Goat		Camel	
	YTD	May	YTD	May	YTD	May
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	1,194	182	0	0	0	0
Egypt	0	0	0	0	0	0
Thailand	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,194</b>	<b>182</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### NT CATTLE MOVED INTERSTATE

Destination	Number
NSW	816
QLD	24,929
SA	6,511
VIC	805
WA	3,547
<b>Total</b>	<b>36,608</b>

### NATIONAL CATTLE PRICES

[www.mla.com.au/prices-and-markets](http://www.mla.com.au/prices-and-markets)

### CURRENCY EXCHANGE RATES

[www.oanda.com/currency/converter](http://www.oanda.com/currency/converter)

Total Cattle, Port of Darwin								NT Cattle, Port of Darwin							
2008	2009	2010	2011	2012	2013	2014	2015	2008	2009	2010	2011	2012	2013	2014	2015
364,944	347,314	295,605	269,617	246,990	359,616	493,958	487,568	295,539	304,818	272,749	253,797	234,249	308,784	324,477	287,892

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## JUNE 2016

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## Livestock disease investigations

The Department of Primary Industry and Fisheries (DPIF) 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.

During the January-March 2016 quarter 80 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the Northern Territory. The number of investigations by species of livestock is shown in Figure 1.

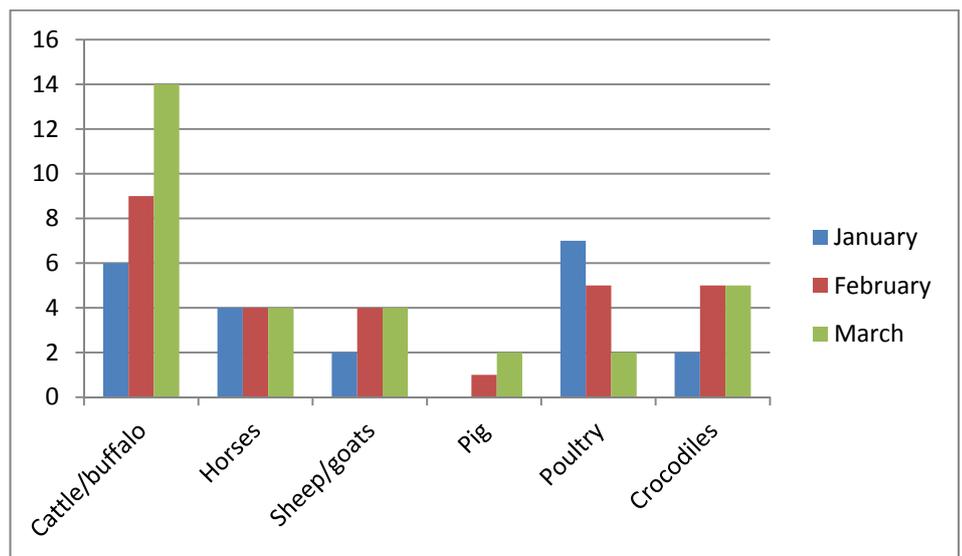


Figure 1. Livestock disease investigations by species for Jan-Mar 2016

Berrimah Veterinary Laboratories processed 154 livestock sample submissions including 74 samples to substantiate proof of disease freedom certifications, and for accreditation programs and targeted surveillance to support market access.

The following case reports are a selection of field investigations of livestock disease incidents during the quarter.

# Livestock disease investigation case reports

## Ketosis (Acetonaemia) in cattle

Plant toxicity was initially suspected as the cause of cattle deaths on a pastoral property north of Alice Springs. Necropsy on an eight-year old Brahman cross cow revealed the animal was in reasonable body condition and approximately seven months pregnant with a grossly pale and friable liver. Ketosis was confirmed through testing of blood samples collected. Ketosis occurs in cattle when the animal uses more glucose (sugars) than what it is able to acquire from available feed. Excessive ketone bodies in the bloodstream come from the breakdown of fat when the animal is forced to draw on its bodily reserves for energy. Although the metabolism of body fat provides energy for cows, the nervous system is dependent on glucose, and the ketones produced as a result of excessive fat metabolism can have toxic effects. This is exhibited in two main forms;

### Wasting form

As the name suggests, this form results in animals losing condition. Signs include:

- decline in appetite over two to five day period
- depraved appetite, eating anything, including dirt and rocks
- selective eating, may eat hay and grass but will not eat pellets/grain
- weight loss from lack of feed
- dull coat.

### Nervous form

This form of ketosis is associated with neurological signs, such as:

- apparent blindness
- incessant licking
- grinding of teeth
- circling and bellowing loudly.

When there has been an absence of significant rainfall, the nutritional value of pasture will decline considerably. In this case, it is suspected that a number of animals may no longer have been able to source sufficient feed from pasture alone, to maintain the growth of their foetus. This condition may be more common than many extensive pastoralists would suspect as losses are often sporadic and not as obvious as plant poisonings or a disease outbreak. The diagnosis of ketosis is an indication of the need to provide supplementation to animals in late pregnancy during periods when the nutritional value of pasture has declined.

Further information on ketosis <https://www.daf.qld.gov.au/animal-industries/dairy/health-management-and-diseases/ketosis-acetonaemia>

## Zamia poisoning in two heifers

The owner of two heifers on a Darwin rural block noted progressive hind limb lameness in both animals over a period of two months. There were no other clinical signs and the heifers were in good condition. Cattle had been on the block for the previous 12 months. The heifers were hand fed pellets daily but no mineral supplement was provided. Clinical examination revealed severe hind limb ataxia (in-coordination) in both heifers; they knuckled and fell when forced to move. The paddock was found to contain abundant palm-like cycad shrubs (*Zamia* sp.).

The heifers were euthanized and there were no significant abnormalities of gross tissues on necropsy. The rumen of one heifer contained a large amount of plastic sheeting. The most significant laboratory finding was degeneration of the white matter of the lumbar spinal cord in both animals, consistent with damage caused by chronic *Zamia* spp. intoxication. *Zamia* leaves and seeds contain at least two toxins; a chemical that damages the liver and intestines, and an unidentified neurotoxin that causes irreversible damage to the nerves of the spinal cord. All mammals can be poisoned but cattle are primarily affected by



*Grazed zamia palm*

the neurotoxin, observed as characteristic 'zamia staggers'. There is no treatment for poisoning. Transmissible spongiform encephalopathy (TSE) was excluded in both animals. Cattle affected by zamia showing neurological signs may be eligible for testing under the national Transmissible Spongiform Encephalopathy (TSE) or 'Mad Cow' surveillance program, with a producer subsidy of \$300 per animal.

In this case, inadequate availability of roughage may have led to consumption of unpalatable material by the heifers, with long-term consumption of *Zamia* shrub contributing to intoxication.

*Further information on zamia poisoning*

[https://www.nt.gov.au/\\_data/assets/pdf\\_file/0003/256053/zamia-cycad-poisoning-information-for-livestock-owners-Mar16.pdf](https://www.nt.gov.au/_data/assets/pdf_file/0003/256053/zamia-cycad-poisoning-information-for-livestock-owners-Mar16.pdf)

### **Water belly (Uroperitoneum) in a recently transported steer**

A steer held in station yards after recent transport from another property was found sitting upright and alert but made no attempt to rise when approached. It was noted that its abdomen was bloated and eyes sunken. The animal was euthanized and approximately 40 litres of fluid was found free in the abdominal cavity suggestive of uroperitoneum, also known as water belly.

The most common cause of uroperitoneum in ruminants is obstructive urolithiasis (bladder stones). In this case, the cause of the uroperitoneum was unknown because the source of urinary tract rupture was not identified by the submitting veterinarian and the animal's recent arrival on the property limited the information available on some of the possible predisposing causes.

Predisposing factors for obstructive urolithiasis include excessive mineral intake, which can occur from highly mineralised artesian water or from high concentrate diets; ingestion of certain plants containing high levels of oxalate, oestrogens or silica; diets high in magnesium; feeding high concentrate low roughage rations, pelleted rations or rations high in phosphate; and concentrated urine, which is produced when there is no drinking water available or when water is of poor quality.

*Further information on uroperitoneum* [http://www.nt.gov.au/d/Content/File/p/Anim\\_Dis/844.pdf](http://www.nt.gov.au/d/Content/File/p/Anim_Dis/844.pdf)

### **Joint-ill in buffalo calves**

A paddock of Riverine and Swamp buffalo cows had been calving normally for the previous three months with no calf or cow losses. Over a period of two days, the manager of the property noted four of the youngest calves, aged approximately one to two weeks, were spending an increasing amount of time lying down away from the herd. The dams of the affected calves were experienced mothers and there had been no known disruption to colostrum transfer. The four calves were alert, feeding and not dehydrated. However, they were very reluctant to stand and, when forced to move, they walked slowly with hunched

back and hyperextended legs to varying degrees. Clinical examination revealed hot painful joints of the limbs of all affected calves. White blood cells were mildly elevated in two of the calves indicative of infection. The serum proteins (albumin and globulin) were low to normal. Malnutrition and congenital immune deficiency can cause a decrease in total globulins. Gamma glutamyl transferase (GGT) levels were normal range. GGT levels would be expected to be much higher (up to 60 times) in calves younger than 30 days old due to the high level of GGT in colostrum, which suggested the calves may have been somewhat colostrum-deprived. Joint fluid collected aseptically from three of the calves was cloudy, with abundant white blood cells. *Escherichia coli* (*E.coli*) was cultured from joint fluid and/or blood samples of all calves.

Despite two courses of antibiotic therapy, initially with long-acting tetracycline and subsequently with daily trimethoprim-sulpha, the calves failed to improve and were euthanized. Necropsy of all calves confirmed severe chronic polyarthritis. There were also abscesses around the ear tags of two calves. The manager was advised to use a disinfectant when tagging calves. There were no further losses reported. It is possible that the particularly hot weather resulted in calves spending increased time in water wallows.

These wallows may have had a build-up of environmental contamination due to the drier-than-usual weather.



*Joint ill in buffalo calf*

Joint ill is occasionally seen in orphaned calves, particularly when a number of calves are housed in one yard. Limited colostrum from the dam compromises the immune system of the calf and predisposes the calf to infection. Iodine should be sprayed on the umbilicus of orphaned calves and prior to ear tagging and sick calves isolated from other healthy calves.

### **Polioencephalomalacia (PEM) in a Brahman calf**

A two-week-old female Brahman calf in the Darwin region was observed to be dehydrated, listless and easily caught. The calf exhibited a flaccid drooping head and ataxia and the next day was convulsing with opisthotonos (body arches backwards with head and legs in hyperextension) and was euthanized. The cow showed no abnormal signs. Gross necropsy revealed no significant findings. Histopathology on various brain sections showed severe polioencephalomalacia and there was a colitis with predominance of bacteria in the intestine.

Polioencephalomalacia is a poorly understood condition that has a myriad of possible causes, including water deprivation (salt toxicity), mercury intoxication, lead intoxication, hypoglycaemia, treatment with the coccidiostat amprolium, sulphur toxicity and thiamine deficiency. Thiamine deficiency is the most commonly recognised cause in ruminants and, in older weaned animals, is often related to a sudden change in diet with associated change in intestinal flora to thiaminase-producing bacteria.

The cause of the polioencephalomalacia in this young calf was not obvious, with the only possible indication being the colitis and associated colonic proliferation of bacteria suggesting there may have been a problem with normal intestinal flora, allowing proliferation of potentially thiaminase-producing bacteria. The case was isolated, with other calves in the herd remaining normal.

# Sarcostemma (pencil caustic) poisoning

## Description and distribution

Sarcostemma species, also known as pencil caustics, caustic vines or caustic bushes, are a species of succulent greyish-green bush with smooth, cylindrical stems and a milky sap. The most common species forms an upright mound up to one metre tall and one and a half metres wide. From September to June, cream star-shaped flowers occur in clusters on short stalks at joins in the stem. There are three species of sarcostemma plant native to Australia; the most common is *S. viminalis* subsp. *australe*. It grows in arid areas, particularly in red soils or acacia scrubs.

## Toxin

The toxin is thought to be a pregnane glycoside found in the stems of the plant, which interferes with the central nervous system. The minimum toxic dose can be as little as a half kilogram to one kilogram of the plant for adult cattle and horses. There are historic reports of cattle having eaten the plant with no effects, so there may be variations between plants or regions.



## When poisoning occurs

Poisoning occurs when feed is scarce and hungry cattle are forced to eat the plant. This occurs particularly after fires, when the Sarcostemma forms new shoots before other pasture has had a chance to regrow. Young and imported stock may be more likely to consume the plant.

## Signs

As the toxin acts on the nervous system, the first signs are restlessness, staggering, muscle tremors and then collapse. This is generally followed by seizures, jaw clenching, paddling with the legs and side-to-side movement of the eyeballs. Death may take up to a week. There are no specific findings on post-mortem, so a diagnosis is usually made on signs and identification of consumed plant.

## Treatment and prevention

There is no treatment for this poisoning. To reduce the risk of poisoning, prevent young or hungry stock from accessing the plant, especially when other feed in the paddock is scarce.

If you suspect sarcostemma poisoning in your cattle, contact your local Regional Veterinary Officer to conduct a disease investigation.

Cattle showing neurological signs may be eligible for testing under the national Transmissible Spongiform Encephalopathy (TSE) or 'Mad Cow' surveillance program, with a producer subsidy of \$300 per animal.

## OIE evaluation of Australia's veterinary services

Australia's veterinary services were recently evaluated by the World Organisation for Animal Health (OIE); the body that sets health standards for international trade in animals and animal products. In October and November 2015, an expert team undertook the national assessment, visiting the Territory over a five day period to meet with representatives from the cattle, buffalo and live export industry together with government officers, private veterinarians and other relevant stakeholders.

The OIE's final report of Australia's Performance of Veterinary Services (PVS) evaluated Australia's animal health and biosecurity system with most criteria rating very highly. This independent and globally recognized report stands Australia's reputation as a producer and exporter of safe and healthy animals and animal products in good stead.

The report's findings show how the parts of our veterinary system add up to deliver a strong animal health status that in turn underpins our capacity to access international markets. More than 130 countries, including many of Australia's major trade competitors, have been assessed by the OIE against the same standards.

Some of the recommendations/issues raised by the OIE team relevant to the NT cattle industry include:

- review of Bovine Johnes disease and cattle tick management zones
- review of government veterinary service resources
- implementation of national feed safety standards
- national forum to coordinate animal welfare legislation and compliance
- registration of veterinary paraprofessionals such as stock inspectors, cattle spayers and pregnancy testers and vet nurses
- perceived conflict of interest for private veterinarians (authorised as Australian Government Accredited Veterinarians (AAVs)) contracted by the private export sector for live export processes
- no veterinary oversight in domestic abattoirs.

*The full OIE PVS report is available at*

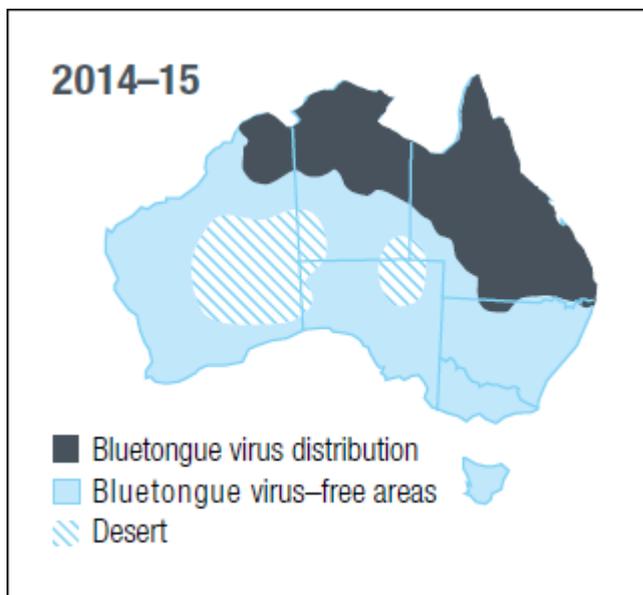
[http://www.oie.int/fileadmin/Home/eng/Support\\_to\\_OIE\\_Members/docs/pdf/FinalReport\\_PVS\\_Australia.pdf](http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/docs/pdf/FinalReport_PVS_Australia.pdf)

## National Arbovirus Monitoring Program (NAMP)

NAMP is a program which monitors the distribution of three important insect-borne viruses (arboviruses) of livestock:

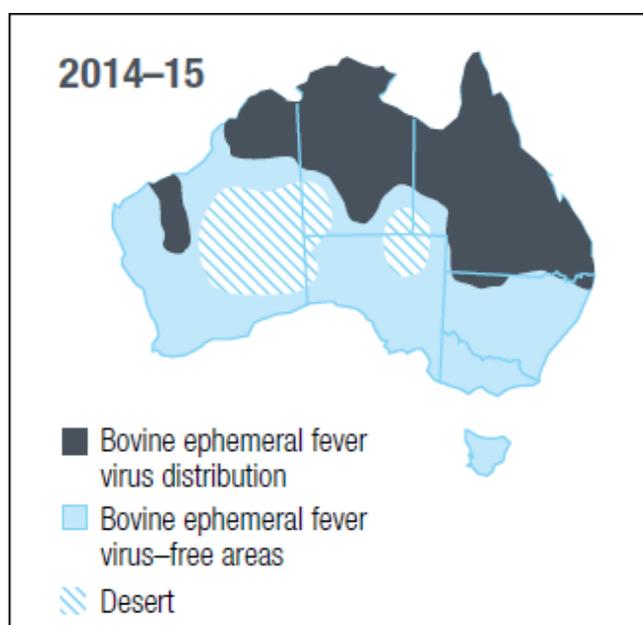
- bluetongue virus (BTV) that causes bluetongue disease in sheep and other ruminants
- akabane virus that cause congenital malformation in ruminants
- *Ephemerovirus* that causes bovine ephemeral fever (BEF) or three-day sickness in cattle and water buffalo.

Arboviruses are spread by *Culicoides* midges and the distribution of these insects varies seasonally. In the Northern Territory BTV activity occurs in the north while the south remains free. The boundary between these zones—the surveillance zone runs across the south-western Katherine region, south-eastern Tennant Creek region and northern Alice Springs region.



DPIF maintains a network of sentinel cattle herds at research stations throughout the Territory which are bled on a weekly or monthly basis and tested for arbovirus exposure. Industry also participates in surveillance with approximately 30 head of homebred cattle aged 12-18 months being bled on properties across the surveillance zone. The results of these tests are used to update the NAMP map and reflect the seasonal changes in arbovirus distribution.

Several strains of bluetongue virus have been identified in Northern Territory since the 1970s but have not produced clinical disease in cattle. In 2015, two new strains of BTV not previously reported in Australia; BTV-5 and BTV-12 were detected with no signs of clinical disease. This was reported internationally with limited impact on markets. BEF and Akabane are both endemic in northern NT and can cause seasonal illness and production losses in cattle, particularly when cattle are infected in southern areas.

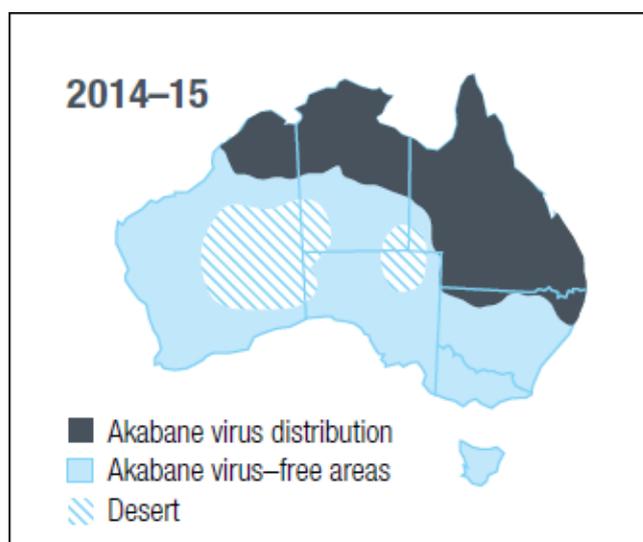


#### What is NAMP used for?

To support trade: NAMP information is used during export protocol negotiations and to assist exporters in meeting export certification requirements.

To provide an early warning to producers: surveillance detects new incursions and warns producers of arboviral spread into new areas where cattle not previously exposed may suffer severe symptoms.

To manage risk: exporters can identify areas free from arbovirus activity to source live export cattle for arbovirus sensitive markets.



#### Why are sheep prohibited in the NT?

The presence of bluetongue virus is the reason why sheep are not permitted in the Territory. Specific legislative requirements for the entry and keeping of sheep were introduced to protect the markets for the Australian livestock industries.

Infection of cattle with BTV has never caused clinical disease in Australia, though sheep are susceptible to BTV and can develop severe illness. There is a high risk of sheep showing clinical signs, and there could be a serious negative impact to NT and Australian exports of cattle and sheep if a single clinical case of BTV was detected in Australia.

Damara sheep, a breed native to South Africa, have been shown to be resistant to clinical bluetongue disease. All other sheep breeds may be susceptible to developing clinical disease. The Chief Inspector of Livestock may issue permits to bring sheep into the NT from other states. Damara breed will be favoured due to their resistance to bluetongue disease. Other breeds of sheep for slaughter may be given permission to be imported during the dry season when *Culicoides* midges are less active.

Further information on NAMP <https://www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-arbovirus-monitoring-program/>

## ***Is brucellosis present in the NT pig population?***

### **What is brucellosis?**

Brucellosis is a disease caused by the *Brucella* bacteria. Different types of *Brucella* bacteria usually infect different animals. Brucellas found within Australia are *Brucella ovis* (sheep) and *Brucella suis* (pigs). Exotic to Australia are *Brucella melitensis* (goats, sheep and camels), *Brucella canis* (dogs), *Brucella ceti* (seals), *Brucella pinnipedialis* (whales, dolphins and porpoises) and now also exotic to Australia since eradication in 1989, *Brucella abortus* (cattle). Brucellosis is a notifiable disease in animals and all forms must be reported to the Chief Inspector.

Within Australia, *Brucella suis* has been identified throughout the wild pig population within New South Wales and Queensland. It has not been previously reported in NT pigs; however there has recently been some evidence to suggest possible infection in people (pig hunters). DPIF is currently reviewing survey options together with the Department of Health and Northern Australian Quarantine Strategy (NAQS) to determine whether there has been a recent introduction of *Brucella suis* into the NT.

*Brucella suis* can be transmitted to humans and dogs through contact with infected pigs. The source of infection is via cuts or open wounds or contact with body fluids of infected pigs. Pig hunters and their dogs are most at risk. It is a significant disease of humans. This disease is rarely transmitted from human to human.

### **What are symptoms in pigs?**

Symptoms of infection can take up to two months to show. Signs may include reproductive failure such as abortions, birth of still born or weak piglets, or physical features such as lameness, swollen joints, incoordination and hind leg paralysis. Sows can develop infections of the uterus and have vaginal discharge. Boars may develop swollen or inflamed testicles.

### **What are symptoms in people?**

Symptoms of infection usually occur 5-60 days once exposed although can occur up to six months later. Infections last either days or months with a chance of relapses. Symptoms may include: fever, sweating, lethargy, loss of appetite, headaches and back pain. Spontaneous abortions can occur in pregnant women who have been exposed.

### **What are symptoms in dogs?**

Dogs exposed to infection can remain symptom free and still continue to be alert with no obvious signs of infection. Dogs that do show symptoms may show fever, enlarged testicles, enlarged prostate, back pain, lameness, vomiting, lethargy, enlarged lymph nodes or blood in urine

### **What to do?**

If these symptoms occur in livestock contact your Regional Vet or Livestock Biosecurity Officer.

Further information on Brucellosis in people is available from the Department of Health.

## Selling or purchasing cattle in the NT

Do you know what your legal obligations are under the *Livestock Act and Regulations*?

Before moving cattle or buffalo within the NT you will need to meet requirements for the following:

	NT waybill	NT PIC	Brands	RFID / approved NLIS device	Cattle tick	Welfare standards
<b>Cattle</b> - all destinations	✓	✓	✓	✓	✓	✓
<b>Buffalo</b> - all destinations	✓	✓	x	✓	✓	✓

### Property Identification Code (PIC)

If you keep livestock regardless of the size of your house block, rural block, parcel of land, property, or the species or number of animals and even if they are pets, then a **PIC** is required. An **update your contact details** form should be completed when there are changes to your details or the species or number of livestock change. Registration is free.

**Brands in the NT** – under *Livestock Regulations 60(1)*:

- a person must not sell, give away, exchange or receive travelling livestock that are unbranded cattle
- unbranded cattle, means cattle of at least eight months of age that have not previously been branded
- it is therefore compulsory to brand cattle before they are moved off a property or are sold, unless they are less than eight months of age
- you may apply to the Registrar for special permission to move unbranded cattle
- please discuss with your Regional Livestock Biosecurity Officer.

**Cross branding** cattle or buffalo after purchase is not mandatory in the NT, however if livestock are not cross branded it provides no legal claim to purchased stock. Purchased cattle or buffalo need to be cross branded correctly to provide evidence of ownership.

A **waybill** is a mandatory requirement whenever cattle, buffalo, sheep, goats, camels, alpacas, llamas, deer and pigs are moved outside the boundaries of a property. The waybill must accompany the travelling stock.

- **PIC and property name is required for both origin and destination properties**
- Pink copies must be sent to the Registrar within 28 days of livestock being moved.

**Please note:** In the NT, a NVD or National Cattle Health Statement **does not** replace an NT waybill.

### National Livestock Identification System (NLIS)

- NLIS devices (RFIDs) need to be attached to cattle before they leave the property
- It is the responsibility of the owner of the property receiving cattle to ensure that the NLIS devices are read then transferred to the NLIS database within 48 hours of cattle arriving at the property.

### Cattle tick

- Cattle and buffalo moving from the Cattle Tick Infected Zone (including from the Parkhurst Area to non-Parkhurst Area within the Cattle Tick Infected Zone) to the Control Zone or Free Zone require a clean inspection and supervised treatment by an Inspector prior to movement.
- Cattle and buffalo moving from the Cattle Tick Control Zone to the Free Zone may require inspection and treatment. An Approved Property Management Plan specifies movement conditions for each property based on the presence of cattle tick on the property.

## Welfare standards:

- Land Transport Standards (LTS) apply when cattle and buffalo (and other livestock) are being transported and outline specific requirements such as 'fit to load', time off water, spelling periods etc. to ensure welfare
- New Cattle Standards will be introduced in 2017 which outline specific requirements on property to ensure welfare.

Further information <https://nt.gov.au/industry/agriculture/livestock> or contact your Livestock Biosecurity Officer for assistance:

## Where can you use your brand (branding iron) in the NT?

Check your Certificate of Registration, Certificate of Transfer of Brand or check on the **NT Brands Register search database** <http://brand.primaryindustry.nt.gov.au/> to find answers to these common questions:

What property is your **three-letter brand** and/or **distinctive (symbol) brand** registered for use on?

Are you only branding cattle and/or horses on the property/run written on your **Certificate of Registration**?

### What to do if?

- you are using your **brand on a different property/run** (than where it is registered for use on) you must complete the **Request to Change the Run** form.
- If you are **not the owner of the property or run**, you must have the owner complete the **Owner's Permission to Use Run** form (to accompany application for three-letter brand or Transfer Brand or Change the Run).
- the **registered owner of brand has changed** (by marriage, individuals to business or company, etc.) you must complete an **Application for Transfer of Brand** form.
- the **brand is no longer being used or no longer required**; you should complete the **Application for Cancellation of Brand**. Please note: all registered owners of the brand must sign this form.
- you need to **update your contact details** - please complete the **NT Brands Register - Update your Contact details** form.

### Please remember

- a brand is registered to a person or company for use on a nominated NT property only
- under no circumstances are NT brands to be used on another property without special permission from the Registrar (together with owner's permission to use the run)
- this means the brand can be used only by the registered owner (or their representative) on the registered NT property as stated on the Certificate of Registration or the Certificate of Transfer of Brand
- it does not restrict branded cattle being registered on other properties.
- to brand on a NT property not registered with the Registrar is an offence under the *Livestock Regulations* may incur a penalty.

**Please note:** If any brand needs to be cancelled, ownership changed, run changed or there are questions concerning the brand/s, in the first instance, please contact your Livestock Biosecurity Officer for advice and assistance. All forms are located on the website

<https://nt.gov.au/industry/agriculture/livestock/brand-and-identify-livestock>

## Returning NT waybills (pink copies to DPIF)

Have you sent your PINK copies in to your Regional Livestock Biosecurity Officer recently?

It is a mandatory requirement for cattle, buffalo, sheep, goats, camelids (including camels, alpacas and llamas), deer and pig owners to complete a waybill whenever stock are moved outside the boundaries of a property.

**[Pink copies must be sent within 28 days](#)**

It is an offence under the *Livestock Regulations* not to complete a waybill correctly and may incur a penalty for not submitting the waybill pink copies to the Registrar in 28 days after completion.

**NT PICs** – use the **NT PIC search database** - <http://pic.primaryindustry.nt.gov.au/>

**National PIC Registers** using your NLIS account-<https://www.nlis.com.au/> *Search the PIC register*

<b>Darwin region</b> Rob Wait (A/RLBO) Animal Biosecurity, DPIF GPO Box 3000 Darwin NT 0801	<b>Katherine region</b> Josh Haigh (RLBO) Animal Biosecurity, DPIF PO Box 1346 Katherine NT 0851	<b>Tennant Creek region</b> Tom Haines (PLBO) Animal Biosecurity, DPIF PO Box 159 Tennant Creek NT 0861	<b>Alice Springs region</b> Greg Crawford (RLBO) Animal Biosecurity, DPIF PO Box 8760 Alice Springs NT 0871
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### Useful websites

#### BRANDS

<http://brand.primaryindustry.nt.gov.au/>

#### PICS

<http://pic.primaryindustry.nt.gov.au/>

#### CATTLE TICK

<https://www.nt.gov.au/industry/agriculture/livestock/animal-health-and-diseases/cattle-tick-control>

#### LIVESTOCK WELFARE

<https://nt.gov.au/industry/agriculture/livestock/moving-and-exporting-livestock/livestock-welfare-and-land-transport-standards>

#### NLIS

<https://www.nlis.com.au/>

#### NTG website

<https://nt.gov.au/industry/agriculture/livestock>

## ***Animal biosecurity staff contact details***

<b>Head office</b>		<b>Fax: 08 8999 2146</b>
Kevin de Witte   Chief Veterinary Officer (CVO)	P: 08 8999 2130	M: 0408 869 446
Sue Fitzpatrick   Principal Veterinary Officer (PVO)	P: 08 8999 2123	M: 0407 498 003

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<b>Livestock Identification &amp; Movement</b>		<b>Fax: 08 8999 2146</b>
Sharon Kearney   Principal Livestock Regulatory Officer	P: 08 8999 2031	M: 0401 112 031
Adele Kluth   Livestock Identification Systems Administrator (LISA)/Brands	P: 08 8999 2033	n/a

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<b>Darwin office</b>		<b>Fax: 08 8999 2146</b>
<b>Livestock</b>		
Elizabeth Stedman   Veterinary Officer (VO)	P: 08 8999 2035	M: 0427 003 600
Rob Wait   A/Regional Livestock Biosecurity Officer (A/RLBO)	P: 08 8999 2034	M: 0401 115 802

<b>Crocodiles / Bees</b>		
Vicki Simlesa   Technical Officer	P: 08 8999 2036	M: 0401 115 853

<b>Meat Industry</b>		
David Frost   Senior Meat Industry Officer (SMIO)	P: 08 8999 2255	M: 0401 113 090

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<b>Katherine office</b>		<b>Fax: 08 8973 9759</b>
John Eccles   Field Veterinary Officer (FVO)	P: 08 8973 9716	M: 0407 498 003 Sat: 0404 983 360
Josh Haigh   Regional Livestock Biosecurity Officer (RLBO)	P: 08 8973 9767	M: 0467 740 233 Sat: 0404 439 012
Renaë McLean   Livestock Biosecurity Officer (LBO)	P: 08 8973 9765	M: 0427 604 002 Sat: 0449 278 549

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<b>Tennant Creek office</b>		<b>Fax: 08 8962 4480</b>
Thomas Haines   Principal Livestock Biosecurity Officer (PLBO)	P: 08 8962 4458	M: 0401 113 445 Sat: 0424 217 877
Greg Maguire   Livestock Biosecurity Officer (LBO)	P: 08 8962 4492	M: 0457 517 347 Sat: 0450 943 435

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Peter Saville   Senior Field Veterinary Officer (SFVO)	P: 08 8951 8181	M: 0401 118 181 Sat: 0404 034 632
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