Message from the editor

This issue we are adding a new section to the newsletter- a spotlight on technology. Callen Thomson opens this up with a really interesting article on a new app for drone users on page eight. It seems there is a lot happening in the technology arena at the moment in terms of trials of new tech on farm. I am really interested to know what growers are using or thinking about using. So I invite you to let us what you are using on your farm, do you fly drones to check your mango flowering or irrigation? Do you have any nifty cattle tracking apps or the enhanced reality apps that let you monitor your water tanks?

The weather looks set to be hotter and drier than average for the next couple of months. I know the mangoes are ready for the picking and it is a busy season ahead, so I will let you get back to it.

Cheers,

The Editor
Crop field trip

Nick Hartley, Senior Technical Officer.

Senior Research Agronomist Ian Biggs and I were recently invited to attend a Cropping Demonstration Trial day at a little town called Laura in far North Queensland. Held earlier this year on May 11, the field day was at Fairview station in Laura. The trials and the field day were organised and run by Tony Matchett an agronomist for Tableland Fertilisers Mareeba, in consultation with Greg Mason, Industry Development Officer for the Department of Agriculture & Fisheries Queensland.

85 people attended the Field day as well as a number of other consultants including Sun Rice, Nu Seeds, Pioneer Seeds, Pacific Seeds, Plant Solutions Australia and the Queensland Department of Agriculture and Fisheries (QDAF). Each group discussed their research results and ran demonstration trials.

These included new seed treatments, and plant variety trials for chickpea, Sunn hemp, canola, linseed, safflower, sunflowers, maize, rice and chia. One specific trial discussed was the use of Liberty White Sorghum for headlage. The overall trip was a worthy exercise and really did show the huge potential that Northern Australia has for growing different types of crop species.

It was excellent liaising with other researchers, producers, retailers and extension staff creating new linkages. Discussions were held with Sun Rice, local agronomists, seed companies and plant breeders in regards to potential future work programs for the Northern Territory.

Figure 2: Some of the varieties on show at the field day.
Cool season production of tropical grasses

Figure 3: Grass trial at CPRS, November 2016

Arthur Cameron, Principal Pastures Agronomist, Darwin

There is interest in growing fodder under irrigation during the Top End dry season to supply live cattle export yards and cubing/pelleting plants with hay. Tropical grasses generally do not grow well under irrigation during the cooler months of the year in the Top End of the Northern Territory (NT). Sugargraze Forage sorghum (Sorghum sp) and Finecut Rhodes grass (Chloris gayana) have been shown to produce commercial yields of 25 to 35 tonnes per hectare per year at Douglas Daly Research Farm (DDRF). Both of these options for fodder production under irrigation have limitations. The Forage sorghum generally needs to be resown every year to maintain a productive stand. In the Top End, the Finecut Rhodes grass is not liked by cattle as a fodder, and it has a high tensile strength, which makes it difficult to grind and make into fodder cubes and pellets.

There are a number of other tropical grasses which have cold tolerance, and may be suitable as alternatives to Forage sorghum and Finecut Rhodes. The cool season growth of seven other tropical grasses was compared with that of Finecut Rhodes at Coastal Plains Research Station to select one or more cultivars which have equivalent or better cool season growth and/or better acceptance by cattle and better grinding characteristics.

Seven of the grasses were sown by seed in December 2014. The eighth grass, Strickland Finger grass, was planted by runners in February 2015. The grasses planted and the first year’s yield results are presented in Table 1 (below). The establishment was good except for the Premier Digit grass which was attacked by Crab grass leaf beetle larvae. While Strickland finger grass and Premier digit yields were lower overall, the yields were similar for all of the grasses at the final harvest.
Table 1 2015 Dry matter yields

<table>
<thead>
<tr>
<th>Grass</th>
<th>DM kg/ha (2015)</th>
<th>6 May</th>
<th>25 Jun</th>
<th>11 Aug</th>
<th>29 Sep</th>
<th>17 Nov</th>
<th>Total Kg/ha DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finecut Rhodes</td>
<td>5980</td>
<td>5500</td>
<td>3000</td>
<td>6900</td>
<td>7080</td>
<td>28450</td>
<td></td>
</tr>
<tr>
<td>Gulfcut Rhodes</td>
<td>6980</td>
<td>4720</td>
<td>2690</td>
<td>7350</td>
<td>6990</td>
<td>28720</td>
<td></td>
</tr>
<tr>
<td>Reclaimer Rhodes</td>
<td>7730</td>
<td>4990</td>
<td>2850</td>
<td>6570</td>
<td>7500</td>
<td>29640</td>
<td></td>
</tr>
<tr>
<td>Premier digit</td>
<td>940</td>
<td>1540</td>
<td>2110</td>
<td>4940</td>
<td>7120</td>
<td>16640</td>
<td></td>
</tr>
<tr>
<td>Strickland finger grass</td>
<td>4690</td>
<td>4360</td>
<td>2450*</td>
<td>6030</td>
<td>6770</td>
<td>24370</td>
<td></td>
</tr>
<tr>
<td>Gatton panic</td>
<td>7340</td>
<td>6510</td>
<td>2230</td>
<td>4930</td>
<td>6340</td>
<td>27350</td>
<td></td>
</tr>
<tr>
<td>Nucal panic</td>
<td>8980</td>
<td>4630</td>
<td>3590</td>
<td>6538</td>
<td>7880</td>
<td>31320</td>
<td></td>
</tr>
<tr>
<td>Splenda setaria</td>
<td>9280</td>
<td>5870</td>
<td>2290</td>
<td>6210</td>
<td>6320</td>
<td>29980</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>6490</td>
<td>4760</td>
<td>2660</td>
<td>6180</td>
<td>7000</td>
<td>27100</td>
<td></td>
</tr>
</tbody>
</table>

Please note that the dry matter yields presented here are at 0% moisture. Hay generally is about 12% moisture, so hay yields would be that much higher. Strickland finger grass yield was decreased by selective grazing by wallabies prior to the 11 August harvest.

The trail continued during 2016 to get a full dry season's results. Samples from each harvest were submitted for nutrient and quality analysis. The plots were cut and cleared off on 23 February 2016, then fertilised. The irrigation was turned on to water the fertiliser in, and left turned on because of the low rainfall wet season. Results to date for 2016 are presented below. At the clearing cut, the site was dry. Nucal clearly had the best yield, estimated at 5 tonnes/ha of dry matter, with the rest about the same yield of about 3.5 tonnes except for the 2 Digitarias, which were slightly lower.

The three Rhodes grasses lost an estimated 10 to 15% of plants following this clearing cut. There was no apparent mortality in the other 5 grasses. The 2016 dry matter yields are presented in Table 3

Table 2 2016 Dry matter yields

<table>
<thead>
<tr>
<th>Grass</th>
<th>DM kg/ha (2016)</th>
<th>6 April</th>
<th>31 May</th>
<th>26 July</th>
<th>13 September</th>
<th>25 October</th>
<th>Total Kg/ha DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finecut Rhodes</td>
<td>3850</td>
<td>4520</td>
<td>5800</td>
<td>6500</td>
<td>2480</td>
<td>23140</td>
<td></td>
</tr>
<tr>
<td>Gulfcut Rhodes</td>
<td>3590</td>
<td>4990</td>
<td>6830</td>
<td>5950</td>
<td>1830</td>
<td>23190</td>
<td></td>
</tr>
<tr>
<td>Reclaimer Rhodes</td>
<td>4060</td>
<td>5120</td>
<td>6280</td>
<td>6730</td>
<td>2280</td>
<td>24470</td>
<td></td>
</tr>
<tr>
<td>Premier digit</td>
<td>4110</td>
<td>3130</td>
<td>3240</td>
<td>3820</td>
<td>4040</td>
<td>18330</td>
<td></td>
</tr>
<tr>
<td>Strickland finger grass</td>
<td>4790</td>
<td>3710</td>
<td>3820</td>
<td>4270</td>
<td>3520</td>
<td>20110</td>
<td></td>
</tr>
<tr>
<td>Gatton panic</td>
<td>4370</td>
<td>3950</td>
<td>3910</td>
<td>4180</td>
<td>2840</td>
<td>19250</td>
<td></td>
</tr>
<tr>
<td>Nucal panic</td>
<td>6380</td>
<td>4020</td>
<td>4780</td>
<td>5630</td>
<td>6150</td>
<td>26950</td>
<td></td>
</tr>
<tr>
<td>Splenda setaria</td>
<td>2720*</td>
<td>4920</td>
<td>4910</td>
<td>3620</td>
<td>4370</td>
<td>20550</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4230</td>
<td>4300</td>
<td>4950</td>
<td>5090</td>
<td>3440</td>
<td>22000</td>
<td></td>
</tr>
</tbody>
</table>
Splenda setaria yield on 6 April was reduced because it was set back when the plots were sprayed for broadleaf control with metsulfuron methyl/2,4-D amine.

At the harvest on 13 September, some of the grasses were displaying symptoms of potassium deficiency, so the potassium application for the final period was doubled.

At the final harvest it was noticeable that the plant populations in most of the Rhodes grass plots and in the Gatton panic had declined significantly. This is reflected in the yields from the final harvest. These four grasses would have to be resown as the plant population was too low to provide a hay crop in the future.

The yearly and two year total yields are presented in the Table 3 below.

Table 3 Yearly and Overall Total yields

<table>
<thead>
<tr>
<th>Grass</th>
<th>Total DM 2015 Kg/ha</th>
<th>Total DM 2016 Kg/ha</th>
<th>Total DM 2016 Kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finecut Rhodes</td>
<td>28450</td>
<td>23140</td>
<td>51600</td>
</tr>
<tr>
<td>Gulfcut Rhodes</td>
<td>28720</td>
<td>23190</td>
<td>51900</td>
</tr>
<tr>
<td>Reclaimer Rhodes</td>
<td>29640</td>
<td>24470</td>
<td>54100</td>
</tr>
<tr>
<td>Premier digit</td>
<td>16640</td>
<td>18330</td>
<td>34970</td>
</tr>
<tr>
<td>Strickland finger grass</td>
<td>24370</td>
<td>20110</td>
<td>44480</td>
</tr>
<tr>
<td>Gatton panic</td>
<td>27350</td>
<td>19250</td>
<td>46600</td>
</tr>
<tr>
<td>Nucal panic</td>
<td>31320</td>
<td>26950</td>
<td>58570</td>
</tr>
<tr>
<td>Splenda setaria</td>
<td>29980</td>
<td>20550</td>
<td>50530</td>
</tr>
<tr>
<td>Mean</td>
<td>27100</td>
<td>22000</td>
<td>49100</td>
</tr>
</tbody>
</table>

Overall, the yields of all the grasses were satisfactory. The annual yield for 2016 was 5t lower than 2015. This was because the first cut in 2016 was only used as a clearing cut. The trial was not fertilised and managed to produce a hay cut until February. The highest yield was Nucal panic at 58t followed by Reclaimer Rhodes at 54t.

The average dry matter yields for each cool season harvest (cut 4 in 2015 and 5 in 2016) and the overall mean Crude protein percentage (CP%), Dry Matter Digestibility (DMD) and Metabolisable Energy (ME) are presented in Table 4.

Table 4 Mean yields per harvest and mean overall quality factors for cool season harvests

<table>
<thead>
<tr>
<th>Grass</th>
<th>2015 Yield per cut kg/ha</th>
<th>2016 Yield per cut kg/ha</th>
<th>2 Year Yield per cut kg/ha</th>
<th>CP%</th>
<th>DMD%</th>
<th>ME MJ/kg DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finecut Rhodes</td>
<td>5620</td>
<td>4630</td>
<td>5070</td>
<td>9.8</td>
<td>49.0</td>
<td>6.9</td>
</tr>
<tr>
<td>Gulfcut Rhodes</td>
<td>5440</td>
<td>4640</td>
<td>4990</td>
<td>9.3</td>
<td>48.1</td>
<td>6.8</td>
</tr>
<tr>
<td>Reclaimer Rhodes</td>
<td>5480</td>
<td>4890</td>
<td>5150</td>
<td>9.7</td>
<td>49.1</td>
<td>7.0</td>
</tr>
<tr>
<td>Premier digit</td>
<td>3930</td>
<td>3670</td>
<td>3780</td>
<td>11.3</td>
<td>55.4</td>
<td>8.0</td>
</tr>
<tr>
<td>Strickland finger grass</td>
<td>4160</td>
<td>4020</td>
<td>4080</td>
<td>10.7</td>
<td>56.8</td>
<td>8.2</td>
</tr>
<tr>
<td>Gatton panic</td>
<td>4920</td>
<td>3850</td>
<td>4330</td>
<td>10.4</td>
<td>54.1</td>
<td>7.8</td>
</tr>
<tr>
<td>Nucal panic</td>
<td>5000</td>
<td>5390</td>
<td>5220</td>
<td>9.2</td>
<td>50.0</td>
<td>7.1</td>
</tr>
<tr>
<td>Splenda setaria</td>
<td>5660</td>
<td>4110</td>
<td>4800</td>
<td>9.3</td>
<td>56.4</td>
<td>7.9</td>
</tr>
<tr>
<td>Mean</td>
<td>5030</td>
<td>4400</td>
<td>4680</td>
<td>10.0</td>
<td>52.4</td>
<td>7.5</td>
</tr>
</tbody>
</table>
The quality figures suggest that Strickland is the best quality grass, followed by Splenda setaria and Gatton panic, with a gap to Nucal, followed by the three Rhodes grasses.

These results have not been analysed yet, so the differences between some of the grasses may not be statistically significant.

Managing magpie geese on your orchard

With the start of the wet season around the corner, and magpie geese flocking back into the Top End, we spoke to Parks and Wildlife about the ins and outs of magpie goose control in your farm or orchard. Tracey Duldig is the Assistant Director of Wildlife Operations for the Parks and Wildlife Commission, and Sally Heaton is the Manager of Wildlife Use and Pest Animals, with the Department of Environment and Natural Resources.

Sally, do you have much to do with magpie geese management in your role?

My role is mainly to implement and manage the “Management Program for the Magpie Goose (Anseranas semipalmata) in the Northern Territory of Australia 2009-2014”. This includes conducting the yearly aerial surveys and collating information for annual population estimates, and declaring dates and daily bag limits for the waterfowl hunting season.

Parks and Wildlife issue the permits for the taking of protected wildlife including the waterfowl hunting permits and the damage mitigation permits available to farmers. The Wildlife Operations team also regulate the activities under these permits and investigate if there are any permit breaches.

If a grower is having trouble with magpie geese damaging their crop how would they go about applying for a permit to control?

In regards to damage mitigation permits– anyone can apply and permits are free. However, applicants need to demonstrate:

- That there is a genuine need and that the animals are causing damage, and the economic impact of the damage.
- What other non-lethal techniques that have been tried and will continue to be used to deter the wildlife before applying for a permit to take wildlife.
- What their capacity to undertake these activities are (i.e. do they have the enough personnel with the correct licenses and training to shoot geese?).

When an application from a farmer to take magpie geese is received it is sent through to the wildlife operations team for assessment and comment. The team may contact the applicant for more details and/or visit the farm and make recommendations before issuing the permit.

Is there a limit to the number of geese that can be shot under these permits?

Yes, there is a maximum total number of geese that will be allocated to farmers.
Do farmers have a choice about who to go through to control the geese?

People who hunt geese for recreational purposes or under a recreational permit may not be the best solution for farmers, as their main aim is to shoot geese to eat, not to deter them from your crop and change goose behaviour over the long-term. Farmers are the permit holder and must authorise people under the permit to shoot geese. Their names must be sent through to Parks and Wildlife before shooting commences.

If there was one main message to impart to growers about magpie goose control, what would it be?

The main message that we would like to get across to farmers is that putting a new “food” source close to wildlife habitat will lead to certain wildlife species utilising this food source and unless crops are netted there will be some losses. Permits to take protected wildlife (damage mitigation permits) are designed to deter pests and should be used as such. If other deterrent means have been tried and are not working and it is decided that shooting is necessary, farmers should look at the times of day when geese are arriving at the farm and try to target the lead birds only. Shooting lots of birds once the flock has settled into an area is not efficient, sustainable or an effective means of control.

Looking for the Tomato Potato Psyllid in the NT

Brian Hennessy, Operations/Planning Coordinator, Darwin.

The Tomato Potato Psyllid (TPP) was found in Perth in February 2017, as reported in the March issue of Top Paddock. This pest affects plants in the Solanaceae and Convolvulaceae families, including potato, tomato, eggplant, capsicum, chilli, sweet potato and tamarillo plants. TPP is also a known vector of Zebra Chip, which can cause significant impacts on plant production.

In response to the detection, a national surveillance campaign was undertaken. The Northern Territory surveillance covered the Alice Springs, Katherine and Darwin regions. More than 30 commercial growers, nurseries and community gardens were contacted and asked to be part of the survey. Sticky traps were installed near host plants at selected properties where they remained for a week before being collected and sent to the Berrimah Farm Entomology Lab for analysis.

![Figure 4: Sticky traps in place on farm.](image-url)
With the assistance of industry and community, the results from the sticky traps have confirmed no evidence of TPP in the Northern Territory. Ongoing surveillance will continue to ensure that any incursion into the Territory it is detected early and potential impacts to market access are minimised.

Support from local growers by continuing to monitor plants and reporting any suspicious symptoms makes a critical difference in the early detection of exotic pests. The symptoms you should look for are:

- Damage to the underside of leaves.
- Insects jumping from foliage when disturbed.
- Severe wilting of plants caused by high numbers of psyllids feeding.
- Yellowing of leaf margins and upward curling of leaves caused by the injection of salivary toxins.
- A sticky liquid called honeydew, which coats the plants, which can lead to sooty mould.
- Stem death symptoms similar to other potato and tomato disorders.

![Symptoms of Tomato potato psyllid infestation include yellowing of leaf margins and upward curling of the leaves.](Photo courtesy of the Western Australia Department of Primary Industries and Regional Development)

Report any suspect plants or diseases to NT Quarantine on 1800 084 881 or via email quarantine@nt.gov.au. Visit the Farm Biosecurity website for more information http://www.farmbiosecurity.com.au/

### Spotlight on Technology

By Callen Thompson, Senior Extension Agronomist, Katherine.

**Where can I fly my drone?**

Drones have many applications, and agriculture is fast becoming a major user of drone technology. Recent changes have allowed commercial users such as agronomists, researchers and primary producers to use sub two kilogram drones legally. This is great news, but where can you fly them and what are the rules?

The Civil Aviation Safety Authority (CASA) has just released an app called “Can I fly there?” The app uses the location technology on your phone to tell you if you can fly your sub two kilogram drone at your current location or at the location indicated by where you move the pointer. It also has links to the rules and regulations around using drones for commercial and recreational use.

Please be aware of CASA regulations before flying a drone. There are heavy penalties for non-compliance.
I thought I would test the app out at the Katherine Research Station (KRS), which as we know whenever we hold an outdoor field day, is close to the Tindal RAAF Base. The screen shot below shows where we are on the map. This is in the approach zone of a controlled airport. The app then tells me that I am not to fly 90m above the height of the airport. If I want to know more about these requirements I can follow the link, “LEARN MORE”.

This is a great tool for anyone flying a sub two kilogram drone. I was unsure if I could use a drone at KRS, but now I know I can if I follow the directions outlined by this app.

Search for “Can I fly there?” in your app store or on their website (www.casa.gov.au/droneapp).

![Can I Fly There? App Screenshot](image)

**Finalisation of the National Banana Freckle Eradication Program**

Brian Hennessy, Operations/Planning Coordinator, Darwin.

The National Banana Freckle Eradication Program (NBFEP) has now entered its final phase – Assessment of Proof of Freedom (Phase 4).

Having first been detected in the Northern Territory in 2013, this strain of banana freckle (*Phyllosticta cavendishii*) is known to severely limit commercial banana production, making its eradication of great importance for the sustainability of the $600 million banana industry, and for the ongoing viability and potential expansion of the Territory’s banana industry.

During the initial two phases, all banana plants in the six red zones where banana freckle had been found were destroyed, followed by a host-free period where no planting of bananas was allowed and any regrowth was destroyed.
Phase 3 saw the re-introduction of banana plants, through a sentinel planting. During this period, which ran from May 2016 to April 2017, disease-free sentinel plants were established in the six red zones. Property owners in the red zones who were not part of the sentinel planting program could obtain a permit and buy disease-free tissue culture banana plants from authorised suppliers, being brought into the Northern Territory (NT) under permit. This resulted in more than 4000 properties growing bananas again.

The sentinel banana plants were monitored over the 12 month period to provide evidence that banana freckle was no longer present in the NT. By the end of Phase 3 there were 33700 banana plants being cultivated in the NT, and more than 6,200 inspections of the sentinel plants had been undertaken with no detections of banana freckle.

On 1 May 2017, the Territory moved into Phase 4 of the program – Assessment of Proof of Freedom. This paved the way for quarantine restrictions, including the banana freckle permit conditions, to be lifted in July 2017. Note that Banana plants and fruit cannot be moved into and out of the NT without a permit. It is also recommended that people maintain good biosecurity practices, including not unnecessarily moving or sharing banana plants during Phase 4.

Two rounds of verification surveillance are required on high risk properties with sentinel plants to cement statistical confidence that the pest is eradicated. The final round of inspections will take place during the 2017-18 Wet season on 336 properties that were previously infected with banana freckle, or were in close proximity to infected areas.

Following the expected successful completion of Phase 4 surveillance in 2018, a submission will proceed to the national biosecurity authorities for the NT to obtain National Proof of Freedom from banana freckle.

The NBFEP has been Australia's largest cost-sharing emergency plant pest response under the National Emergency Plant Pest Response Deed to date, having received federal, state, industry and community support. Great outcomes for biosecurity in the NT have been achieved through this program, and the contribution by industry, those involved in its implementation, and the broader community is truly recognised.
African Mahogany Australia makes the finals in the 2017 Chief Minister’s NT Export and Industry Awards

African Mahogany Australia (AMA), were finalists for the NTEIA Industry Innovation Award for their use of integrated land management technologies. AMA is an agribusiness management company managing the world’s largest African mahogany timber plantation estate, along with cropping for cattle feed production. Formed in 2006, the Northern Territory based company of just three employees manages more than 14000 hectares of timber plantations, produces more than 15000 tonnes of hay, and partners with local cattle producers to graze 3500 head beneath their plantations. This integration of commodities allows AMA to optimise land productivity through smart, sustainable partnerships in their farming community. In the last 12 months AMA has achieved a significant number of milestones including: leading a research and development project to optimise wood products; increasing the capital value of the lands they manage with no capital outlay through grazing and hay production; and reducing fire risk, weed control costs, chemical use, herbicide resistance in their plantations while improving the productivity of their long term product – high value timber. While not winning the award, AMA were excited to be part of the awards and look forward to continuing to integrate technology and innovation into their property management.

Northern Territory Seasonal Outlook

as at September 2017

Figure 8. AMA’s Regional Manager Chris Oliver (L) and CEO Frank Miller (R), finalists in the Chief Minister’s Northern Territory Export and Industry Awards, Darwin, September 21 2017.

Figure 9. Chance of exceeding the median maximum temperature and median rainfall maps for October to December 2017. Sourced from the Australian Bureau of Meteorology (http://www.bom.gov.au/climate/outlooks/)

DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES
Top Paddock Newsletter
The national outlook for October to December 2017 indicates that:

- **Drier** than average conditions are expected across much of the Northern Territory.
- **Warmer** than average days and nights are more likely across the entire Northern Territory.

Climate influences from the Indian and Pacific oceans are likely to be competing, with a weak drying influence from the Indian Ocean potentially cancelling out a slightly wet influence from the Pacific Ocean. In addition to the natural drivers such as the El Niño–Southern Oscillation and the IOD, Australian climate patterns are being influenced by the long-term increasing trend in global air and ocean temperatures.

### Seasonal Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Comments (sourced from the Australian Bureau of Meteorology)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>El Niño Southern Oscillation (ENSO)</strong></td>
<td>ENSO remains neutral, but tropical Pacific continues to cool.</td>
</tr>
<tr>
<td><a href="http://www.bom.gov.au/climate/enso/">Link</a></td>
<td>Sea surface temperatures (SSTs) have steadily cooled over the central and eastern tropical Pacific for the past two months, but remain well within the neutral ENSO range. Temperatures at and below the surface are now slightly cooler than average. Other indicators of ENSO, such as the Southern Oscillation Index (SOI), cloudiness near the Date Line and trade winds also remain at neutral levels. Most international climate models surveyed suggest the tropical Pacific Ocean may cool further, but persist at ENSO-neutral levels for the rest of 2017.</td>
</tr>
<tr>
<td>Current status: INACTIVE</td>
<td></td>
</tr>
</tbody>
</table>

| **Indian Ocean Dipole (IOD)**            | IOD also neutral.                                                                                                         |
| [Link](http://www.bom.gov.au/climate/enso/#tabs=Indian-Ocean) | Most of the climate models surveyed indicate that the IOD will remain neutral during Spring. However, two out of the six models suggest a positive IOD may develop during Spring. A positive IOD is typically associated with below average Spring rainfall over southern and central Australia. If a positive IOD eventuated it would likely be short-lived as IOD events typically break down by December as the monsoon trough moves south towards Australia. |
Property Identification Codes

What’s a PIC and do you need one?

You can play an important part in protecting the NT from the impact of an animal disease outbreak.

If you keep livestock on your block or in your backyard, you MUST register for a Property Identification Code (PIC)

If you keep any of these animals, even just one as a pet, then you need a Property Identification Code.

Livestock includes cattle, buffalo, horses (inc. mules and donkeys), pigs, poultry, deer, llamas, camels, alpacas, sheep, goats and beehives.

Registering for a PIC is easy and free.

Register online at www.nt.gov.au
SAVE THE DATE
NATIONAL AWARD WINNING CONFERENCE

NORTHERN AUSTRALIA FOOD FUTURES
CONFERENCE 2018

SCIENCE AND TECHNOLOGY FOR DEVELOPMENT

2 - 4 JULY 2018
DARWIN CONVENTION CENTRE, NT

CONVERSATIONS AMONGST
FARMERS, POLITICIANS
AND RESEARCHERS

NEW FORMAT INCLUDING
FARM TOURS &
WORKSHOPS

COLLABORATION BETWEEN
NT, WA & QLD

250 PARTICIPANTS
45 SPEAKERS
6 MINISTERS

www.foodfuturesntfarmers.org.au

@NorthernAustraliaFoodFuturesConference

events@associatedadvertising.com.au / (08) 8942 3388

Minh Do
Darwin Farmer

Hosted by
NT FARMERS
Livestock disease investigations

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

From April to June 2017, 76 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the Northern Territory (NT). Figure 1 shows the number of investigations by species of livestock.

Berrimah Veterinary Laboratories processed 177 livestock sample submissions, including samples to substantiate proof of disease freedom certifications, for accreditation programs and targeted surveillance to support market access.

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

**Hendra virus excluded in horse with Crotalaria sp. toxicity**

Acute neurological disease was investigated in an 18-year-old stockhorse mare in June 2017. The mare had been losing weight for the previous three weeks despite a normal appetite, and was observed to suddenly become unbalanced with a 'hunched up' stance. The horse was in a group of three horses that had been brought to the Darwin property from the Katherine region 12 months previously.

On clinical examination, the mare was mildly depressed and dragging the toes of the hind feet, which was more apparent when turned in a tight circle. She was easily pulled to the side on the tail sway test. There was...
no pain or abnormalities found. Hendra virus infection was ruled out with testing of nasal swabs and blood. Further tests suggested that there had been injury to the liver, as well as mild muscle damage associated with loss of muscle/movement control.

On questioning the owners, it became apparent that the horse had access to pastures containing Crotalaria sp. over several years when residing in the Katherine region. Crotalaria sp. contain pyrrolizidine alkaloids that can cause cumulative liver damage and loss of brain function due to the liver being able to remove toxins from the blood (hepatic encephalopathy) in horses several months after ingestion. This condition is commonly known as ‘Kimberley horse disease’ or ‘walkabout disease’. There is no effective treatment for this disease. Despite no known recent exposure to alkaloids, the mare continued to deteriorate and was euthanased. For further information see Agnote K56: Walkabout (Kimberley Horse) Disease.

Figure 11. Crotalaria crispata low growing plant and flower

Report into an investigation of a suspected case of psittacosis in a cockatiel at a roadhouse in Central Australia

A notification was received from a member of the public with wildlife expertise who had visited a roadhouse in Central Australia in late March 2017, advising that three cockatiels in an aviary cage of 25 were exhibiting clinical signs consistent with psittacosis – a significant zoonoses. A photograph of the most severely affected bird was provided, showing the bird ‘fluffed up’ and depressed, with stained plumage and one eye swollen and partially closed, indicating conjunctivitis and possible sinusitis.

At a follow-up visit by the regional veterinary officer, the most severely affected bird was euthanised for necropsy. Gross necropsy revealed caseous conjunctivitis involving both eyes. Histopathology showed a marked squamous metaplasia of lacrimal duct and nasal mucosae, with massive intraluminal accumulation of keratin. There were no notable gross or histological findings in other tissues. Polymerase chain reaction (PCR) testing of pooled cloacal, tracheal and ocular swabs from the euthanased and the two other affected birds excluded influenza type A, Newcastle Disease Virus and Chlamydiaceae bacteria.

A diagnosis of hypovitaminosis A was made, and the owner was given advice to change the birds’ diet. No further losses have been reported.
BHV5 can cause sudden death in young cattle

In the June 2017 Animal Health News we reported on a case of BHV5 which happened on a property outside Katherine in early May 2017. BHV5 is a virus that causes inflammation (swelling) of the brain in cattle. It was first discovered in Queensland in 1962, and is thought to be present worldwide. BHV5 is closely related to bovine herpesvirus 1 (BHV1), the virus which causes infectious bovine rhinotracheitis (IBR) and infectious pustular vulvovaginitis. Infection with BHV5 should be considered in cases of neurological disease or sudden death in young cattle in Northern Australia.

BHV5 is spread through the nasal fluid of infected cattle. When cattle come into contact with this infected fluid via the mouth or nose, they become infected and the virus spreads to the brain. In the brain, the virus can lay `dormant` (not having any affect), or it can cause swelling which can cause neurological signs such as:

- depression
- tremors
- teeth grinding, mouth chomping and salivation
- circling
- laying down.

There is no treatment for BHV5, and severe cases can result in death. In cattle where the virus is dormant, it can reactivate and begin to cause signs if the animal becomes stressed- such as after weaning, mustering, transport or overcrowding. Disease due to BHV5 infection is most commonly seen in weaners under six months of age.

Diagnosis of BHV5 can be made by running lab tests on nasal fluid or tissue samples to detect the BHV5 virus. Generally a full range of post-mortem samples, including the brain, is required. As there are some severe strains of bovine herpesviruses which are exotic to Australia, it’s important to contact your vet and the appropriate testing done.

There is no specific vaccine available for BHV5. In cattle vaccinated against BHV1 or previously infected with BHV1, signs of BHV5 may be prevented. Even immune cattle can still shed the BHV5 virus to other cattle.

Review of the Cattle Tick Program

The Department of Primary Industry and Resources (DPIR) is currently responsible for the management and delivery of a regulated Cattle Tick Program, with co-operation from the cattle industry and other livestock owners, which aims to minimise the cost of cattle tick and tick fever in the Northern Territory (NT).

A review is currently being undertaken to ensure that an effective risk-based, practical and financially viable program is maintained for the management of cattle tick based on clear and simple regulation, sound technical evidence, and appropriate resource allocation through consultation with the relevant livestock industries and other stakeholders. A discussion paper will be released in September 2017, and is focused on addressing several key issues to determine the future management and delivery of the cattle tick program in the NT.
These issues include:

- Which Cattle Tick Zones are required for effective management and whether the Parkhurst Zone and/or the Control Zone are needed.
- Appropriate risk mitigation for cattle tick in high-risk species such as cattle and buffalo and low-risk risk species such as horses.
- What is appropriate risk mitigation for low-risk prior to movement?
- Who is most appropriate person to undertake the cattle tick inspection and treatment (government inspector, third party inspector or livestock owner) and for which species?
- Appropriate certification options which may include inspector or owner declaration.

Following these outcomes, a decision on the funding mechanism (partial cost recovery, full cost recovery, levy or a combination) for the cattle tick program in the short-term and longer-term will be required.

The review provides an overview of the history of cattle tick and management in the Territory including zoning changes, chemical resistance, regulated livestock inspections and treatment statistics for movement, program costs and revenue from inspection services and cattle tick management in other states. It also outlines the current regulatory framework related to notifiable disease reporting obligations, declared areas and movement restrictions for cattle tick and fees for service.

The potential risks associated with cattle tick management in and the issues, risks and benefits associated with options for the future management, delivery and funding of the cattle tick program in the Territory are presented for the cattle industry and livestock owners to consider. A timeline for the activities that will be required if changes are to be made to the program management and/or delivery including regulatory changes is also presented in the review. The review will be presented at industry organisation meetings and livestock owners and other stakeholders can provide feedback on the review to the department.

Sue Fitzpatrick.  susanne.fitzpatrick@nt.gov.au  08 8999 2123 or 0407 498 003

**National Arbovirus Monitoring Programme update**

The National Arbovirus Monitoring Programme (NAMP) monitors the distribution of three important insect-borne viruses (arboviruses) of livestock- Bluetongue virus (BTV), Bovine Ephemeral Fever (BEF or three day sickness) and Akabane. For a number of years, the zone of bluetongue virus activity in the Northern Territory has been largely unchanged and as a result of ongoing sampling from collaborating properties, virus activity had even been shown to be retreating northwards much to the benefit of producers in Central Australia. The recent detection of positive animals on a property in the southern Tennant Creek District has necessitated the movement of the NAMP Bluetongue Line southwards into the northern Alice Springs District.

The Northern Territory currently has three zones under investigation namely a free zone, a surveillance zone and a virus activity (transmission) zone and these zones can change seasonally. Approximately 15 properties have been affected by the changes in their bluetongue status and the DPIR has been in contact with properties in the new surveillance zone to obtain additional blood samples.
NAMP information is used to:

- **support trade**

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

- **provide an early warning to producers**

  Surveillance detects new incursions and warns producers of arbovirus spread into new areas where cattle not previously exposed may suffer severe symptoms.

- **manage risk**

  Exporters can identify areas free from arbovirus activity to source live export cattle for arbovirus sensitive markets. The movement of the NAMP bluetongue line southwards will prevent access for live cattle to bluetongue sensitive markets from properties in the zone of possible transmission. As this zone is largely determined by the distribution of the culicoides vectors, there is little that can be done other than to monitor the distribution through blood sampling and insect trapping.
Northern Australian Biosecurity Surveillance project

The Northern Australia Biosecurity Surveillance (NABS) project is one of several collaborative projects between industry, State and Territory and Commonwealth governments funded by the Agricultural Competitiveness White Paper to manage new and growing biosecurity risks in northern Australia. The NABS project is focused on improving disease surveillance across northern Australia, and a number of key activities have been identified to achieve this during 2017-2019. These activities include providing resources such as tools, technology and training for cattle producers and vets, and subsidies for livestock disease investigations.

Post-mortem (PM) sampling kits

All pastoral properties in the NT will be provided with a post-mortem (PM) sampling kit during the annual property visits undertaken by the Livestock Biosecurity team. This kit can be used to collect samples for laboratory diagnosis in the event that livestock get sick or die.

- Private cattle vets are encouraged to use the property PM sampling kit to assist them in disease investigations. There is also funding available to subsidise the cost of disease investigation in livestock across northern Australia from 2017-2019.
- Early-case blood samples and nasal swabs (prior to death preferred) are sought from any horse that may have unexplained and progressive illness.
- The PM sampling kit includes a maggot collection kit which staff can use to collect maggots from fly-blown wounds.

We suggest keeping the PM sampling kit on the property in location known to staff. The Regional Veterinary officer will provide guidance and instruction on using and returning the sampling kit. DPIR offices in Darwin, Katherine, Tennant Creek and Alice Springs will return replenished sampling kits to the property when submitted as part of a disease investigation.

To get a PM sampling kit for your property, please contact your local Regional Veterinary or Livestock Biosecurity Officer.

Figure 15. PM sampling kit available for all pastoral properties
Screw-Worm fly

Screw-worm fly (SWF) is an aggressive insect pest of warm blooded animals (including people, wildlife and livestock). The fly lays eggs on wounds or moist body openings – the eggs then hatch to become aggressive flesh eating maggots. SWF is related to the blowflies that cause fly-strike in Australian sheep, however SWF prefers hot, humid climates and cannot survive in frost-prone areas.

SWF is widespread through tropical regions, including some of Australia’s closest neighbours – Papua New Guinea, Indonesia, Malaysia and the Philippines. The potential spread of this pest from Papua New Guinea is one of the major biosecurity threats to northern Australia. Establishment of SWF in Australia would have major impacts on northern livestock production, livestock export trade and public health.

In order to eradicate SWF, Australia would need to establish a facility where sterile male flies could be produced in sufficient numbers to interrupt the SWF breeding cycle. The construction of such a facility could take a number of years by which time costs could approach $500 million a year in lost production and control measures. It has been estimated that up to 15 percent of cattle could be struck at any time in the potential zone of infestation, with the greatest losses due to the deaths of newborn calves as a result of navel strike.

Keeping Australia SWF free relies upon early detection, containment and ideally eradication before it can spread to other areas. The Department of Primary Industry and Resources (DPIR) maintains a number of traps close to East Arm Wharf which specifically target SWF. In addition, biosecurity officers regularly inspect cattle for evidence of fly strike.

Regular sampling and laboratory examination of maggots from infested wounds anywhere in Australia is also critical to early detection. Maggot collection kits will be distributed by your local Livestock biosecurity officer in the next few months during property visits. If you see an animal with maggots in a wound please support surveillance by sending maggots to Berrimah Veterinary Laboratory – early detection and response is the key to control.

Figure 16. Left- the adult Old World screw-worm fly (Chrysomya bezziana). Right- screw worm fly egg masses (white) deposited in a wound (Animal Health Australia, 2017)

For more information go to www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/screw-worm-fly/ or contact Peter Saville, DPIR SWF Coordinator 08 89518181 / 0401118181.
## Calendar of Events

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Event Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>16th September- 15th October</td>
<td><strong>Floriade</strong> Canberra</td>
</tr>
<tr>
<td>4 October</td>
<td><strong>Grazing Fundamentals Grazing workshop</strong> for NT cattle producers at Delamere Station</td>
</tr>
<tr>
<td>5th October</td>
<td>Mango auction- Brisbane markets</td>
</tr>
<tr>
<td>17th October</td>
<td><strong>Spray Technology demonstration</strong> (Katherine Research Station)</td>
</tr>
<tr>
<td>20th November</td>
<td><strong>TropAg</strong> 2017 Brisbane</td>
</tr>
<tr>
<td>21st-23rd November</td>
<td><strong>Territory Natural Resource Management conference</strong></td>
</tr>
<tr>
<td>3rd December</td>
<td>Mango Mess-tival- Bondi beach</td>
</tr>
</tbody>
</table>
You can find hundreds of publications on our website. Check our publications page to search for information sheets and agnotes.

Can’t find what you are looking for? Drop us an email and we will help you out.

Subscribe to our newsletters, Top Paddock, Katherine Rural Review, Animal Health eNews to catch up on what we are doing, subscribe online here: [https://dpir.nt.gov.au/primary-industry/primary-industry-publications/regional-newsletters](https://dpir.nt.gov.au/primary-industry/primary-industry-publications/regional-newsletters)

Our YouTube channel has a selection of “how to” videos on practical topics such as stock handling, grafting mangoes and date pollution. There are technical videos looking at measuring nitrous oxide emissions through to research updates.

Contact us:

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


Email: horticulture@nt.gov.au