



# FARMACIST

**NEWS**  
WINTER  
2023

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- Project POD & Bluewater 2
- Biobeds proving effective in trials
- Managing microbes for better beef
- Being proactive for grass control
- Tea tree: drone monitoring and "stump death"
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**Free**

**YOURS TO  
TAKE HOME**



*Cover photo by Kellie Hannusworth*



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# Cover photo



**Congratulations to Kellie Harmsworth for winning our cover photo competition!** This stunning photo was submitted via Facebook Messenger, and we love it! Fitting, too, with our article "Managing microbes for better beef" on page 5.

Thank you to everyone who took part and submitted their favourite farming photos - we loved seeing them all!

## Oh, boy!

**It is with great excitement that we can share with you that Billie has welcomed a beautiful baby boy!**

George arrived safely in April and mum and bub are both doing well.

Billie is a much loved and valued member of our Burdekin team, and we wish her and her little family all the best!



Congratulations, Billie! And welcome to the world, George!

## What's on

**If you haven't already, jump onto our new-look website and check it out! Farmacist.com.au has had an overhaul and has an events section so you can keep up to date with what's on!**

**May has been a busy month for Farmacist, aside from the planting support we've provided!**

- Alice, Daniel and Darren represented Farmacist in precision ag at the Primex field day in Casino.
- Shannon presented on Banana Yield Monitoring at the huge Banana Congress in Cairns.
- Mackay held a Field Walk to look at summer fallow cropping options, Biobeds, and residual herbicide options in soybean.
- The Far North team had a site at the Mareeba field days from May 24th to 26th.
- Zoe Eagger (Farmacist Mackay) has had a huge few months holding Precision Agronomy courses at UQ - more to come on this in the next issue.

**And coming up...**

- The Burdekin team will have a site at the SRA field day on May 31st, with presentations and demonstrations on spray application by Craig Day, and innovative products like timed actuators and Farmacist Connect by Farmacist's own Chris Doblo and Dylan Zemek.
- Craig Day workshops (see page opposite for more details)
  - Burdekin May 29th - 30th
  - Proserpine June 6th 8am-12pm
  - Walkerston June 7th 9am-1pm
  - Koumala June 8th 8am-12pm

**Keep an eye on our socials and on the events page of our website for more upcoming events.**

### CONTACT US

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# FARMACIST GPS SERVICES



- Are you utilising your GPS system to its maximum potential?
- Are your guidance lines where they need to be?
- Do you have your block boundaries, drains, cross head lands, etc RTK mapped?
- Are you utilising your farming operational maps to show your best farming practice?
- Do you need help organising or setting up your GPS system for optimum practice?
- Need help creating a great master file for your GPS set-up, eg Client-Farm-Field-Guidance?

**CONTACT FARMACIST MACKAY (07) 4959 7075**

# Greyback canegrub control in the Burdekin

By Evan Shannon

Given the level of canegrub damage evident from the 2022 harvest season in the Burdekin, growers in areas likely to be impacted by canegrubs need to be considering the use of suSCon<sup>®</sup> maxi Intel<sup>®</sup> in their plant blocks. In addition, growers in areas which have historically had canegrub damage (although perhaps not in recent years) might look to suSCon<sup>®</sup> as a means of minimising future damage to their plant blocks.

To achieve the best results from the product, it is important to adhere to the following steps:

- **Height:** Try to treat the plant cane while it is less than 1m tall.
- **Width of band:** Ensure the cutaway width is narrow and the suSCon<sup>®</sup> is applied in a band 15-20cm wide.
- **Speed:** Keep the application speed low less than 8km/h.
- **Coverage:** The suSCon<sup>®</sup> needs to be covered immediately with 5cm of compacted soil or 10cm of loose soil.
- **Hill height:** Final hill height (over the granules) should only be 15-20cm.



Greyback canegrub at second instar.

In recent times there have been issues with the suSCon<sup>®</sup> being applied too late into tall cane or at relatively high speeds (e.g 12km/h). In big cane it is difficult to place the granules in the correct location, whilst at excessive speeds the granules tend to be thrown about the cutaway.

The suSCon<sup>®</sup> needs to be placed in a band no wider than 20cm; spreading the granules wider than 20cm means a lower concentration than recommended.

Furthermore, excessive hill heights (greater than 20cm of compacted soil) will mean that it is likely that only larger grubs will come into contact with the chemical. This can lead to real problems as it is much easier to control small grubs than larger ones.

If you need more information on suSCon<sup>®</sup> application, check with your local Farmacist agronomist. 🌱



## Craig Day Advanced Spray Chemical Course

Book your place now for Craig Day's Advanced Spray Application! Topics covered include spray drift, water quality, boom setup, and more. Craig has nearly 30 years experience and can talk to you about any spray issues you are having.

**Growers and resellers are encouraged to attend. This is fully funded through Project Bluewater and is FREE to attend.**

**29th - 30th May: Burdekin Region**

**6th June: Proserpine 8am - 12pm**

**7th June: Walkerston 9am - 1pm**

**8th June: Koumala 8am - 12pm**



**Places are limited so please call you nearest Farmacist office now to book!**

Project Bluewater is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, and Farmacist Pty Ltd.



Great Barrier  
Reef Foundation



# Inversion season is here!

By Jess Bennett & Rob Sluggett

**Were you aware that as we come into winter, most early mornings are unsuitable for spraying? Pretty much illegal, in fact! Current regulations prohibit spraying when surface temperature inversions exist.**

Most agricultural chemical labels instruct that spraying should only be done with a wind speed above 3km per hour (typically 3 to 20km/h). At less than that, there is a very good chance that a surface temperature inversion may be present.

## What can you do?

- **Sleep in.** In the morning, wait until wind speed picks up above 3 to 5km/h before commencing spraying.
- **Know when to stop.** In the late afternoon, spraying will normally need to finish as winds drop to 7km/h or lower. This is to ensure spray deposit before cool conditions set in.
- **Pay attention.** Measure and monitor weather conditions at the field of application.
- **Upgrade your nozzles.** Most sugar industry spray rigs are running standard air induction nozzles that are producing around 15% of the spray volume as driftable fines (droplets smaller than 150 microns). These are the droplets that hang in the air longer and move with inversions.

Changing to the latest technology low drift nozzles that allow safer spraying in higher wind speeds during the day is the best approach. If you feel you need to spray when the wind speed is low, you are running the wrong nozzles!

## We can assist!

Farmacist has industry-leading specialists available to support the best choice of nozzles and sprayer setup for your conditions. Funding support may be available to assist with any upgrades. Please get in touch with your local Farmacist agronomist today.

## What is an "inversion" in relation to spraying?

A surface temperature inversion is where the air near ground level becomes cooler than the higher air. Cooler air is more dense, so it stays near the surface. As this air warms during the day, it rises and moves with the prevailing winds.

Small droplets from spraying suspended in this cool air will move with it. It is possible for these droplets to be moved over 30km from the field sprayed.

Think about the huge number of sensitive areas within 30km of your farm.

Towns, schools, creeks, sensitive crops, even your house roof where you catch drinking water.

**Spraying should NEVER be undertaken when there is an inversion present.**



Figure 1: Spraying during an inversion does not let droplets fall.



Figure 2: A classic example of an inversion layer - bands of fog. DO NOT SPRAY!

# Being proactive for grass control

By Michael Macpherson

**Another planting season is upon us here in the Burdekin region and the Farmacist team have been out on-farm with growers actively managing the early season flush of weeds that inevitably occur when we get autumn rainfall and mild temperatures.**

Management of early-germinating grasses in plant cane in this region has traditionally centred around the use of knockdowns with various 'spikes' for control of grass weeds at the spike-3 leaf stage of the crop. When relying on these knockdown style herbicides to do the heavy lifting early, timing is everything for good results - miss the window and options become limited and costly.

The long history of repeated knockdowns for grass control has also led to the development of a phenomenon known in weed science as 'species shift'. This is where the species that are susceptible to a particular practice (like the use of knockdowns) disappear from the population over time, but species that are less responsive begin to dominate the population. In the Burdekin, we are seeing this trend occurring in our grass weed populations; we rarely talk to growers about summer grass (knockdown susceptible) these days, but we are seeing an increase in species such as Lovegrass, Itch Grass and Wild Sorghum (knockdown tolerant).



Figure 1. Stomp was applied to this paddock before the April rainfall event. Note the absence of grass weeds. Vines can be dealt with cheaply and efficiently as required.

**So what can we do as growers and advisors to manage this situation? The answer lies in taking a more holistic approach to our weed management strategies. In other words we need to keep our weeds confused! One of the key principles in weed management science is to use as many different tools as we can, as often as we can so our weeds don't get 'used to' one individual management tool used repeatedly.**

While there are many tools in our toolbox, in this article we want to talk about using our tools within our herbicide toolbox in a more strategic manner. The hardest thing to do from a bio-chemical (herbicide) point of view, is take an emerged weed grass out of a grass crop (in our case, sugarcane). Many grasses, crop and weed, have the same biochemical pathways that constitute their metabolic processes (the way they grow and reproduce). Typically, a herbicide works at a specific point in a biochemical process within the target weed that leads to its decline. Therefore when a crop can tolerate a herbicide, it means that the crop:

- 1) Does not have that same biochemical process for the chemical to act on; or
- 2) It has some mechanism to prevent that chemical from reaching the site of activity (it breaks it down before it does damage).

This 'selectivity' is easy (in relative terms) to do for a broadleaf weed to a grass crop because broadleaf weeds and grass crops have different biochemical processes that a herbicide can target. However, tropical grass weeds and sugarcane both use very similar biochemical processes to grow, hence the difficulty in developing a 'selective' product that is consistent and reliable that doesn't check the sugarcane.

The good news is that we DO have options outside of the knockdown group of products, namely the pre-emergent herbicides.

Because sugarcane emerges from a billet and is planted at depth, we have options to control grasses before they even germinate. These products target pathways that are related to seed germination and emergence – pathways that sugarcane doesn't rely on to establish. Thankfully, these products are particularly strong on the weed species that are less susceptible to our current knockdown strategies such as Lovegrass.

Farmacist has been conducting extensive investigation through various trials on these options over the last three years so we can advise our clients on the most useful options for their particular situation.

This season has provided an excellent opportunity for some of our clients with early plant cane to use one of the strongest pre-emergent herbicide products in the toolbox, Pendimethalin (Stomp® Xtra, Rifle®), in advance of the late April rain event in plantcane that had not yet received its first watering.

All the blocks that Pendimethalin was applied to before the rain have returned excellent results for grass weed control, with upwards of 90% effectiveness on weeds such as Lovegrass. These blocks should now hold through the winter period without further grass pressure, only requiring a quick and cheap vine clean up to see them out to hill-up.

Opportunistic application of Pendimethalin has returned an excellent result for our growers and has taken the selection pressure off of subsequent knockdown passes in these paddocks saving time and cash.

If you would like to know more about how we proactively manage weeds in your sugarcane, get in touch with your Farmacist agronomist for a timely chat.

Don't let those weeds get away! 🌱

# Biobeds proving effective in trials

By Nick Hill

**As a component of the Great Barrier Reef Foundation (GBRF) Project Bluewater 2, Farmacist Mackay has been investigating the ability of Biobeds to remove herbicides and pesticides from water sourced from spray tank mixing and washdown areas.**

## What are biobeds?

In simplest terms, biobeds are a place to retain and degrade herbicides and pesticides. Currently within Europe there are more than 2000 in operation.

## Why bother?

Investigation conducted under GBRF funded Project Bluewater 1 identified spray tank mixing and washdown areas as point sources of pollution with the potential to negatively affect water quality.

## How do they work?

Biobeds contain a mixture of straw or cane trash, compost and topsoil that retains water for a period of time, therefore allowing for the microbial breakdown of herbicides and pesticides.

As shown in Figure 1, three IBC pods are connected in series. Contaminated water enters the first biobed where it slowly moves through the medium. As water leaves the first biobed, water is collected in a bucket and is then pumped into the second biobed. The process is repeated with water leaving Biobed three considered safe for release into the environment.

In the current design format biobeds are limited to receiving 200L per individual event and a total of 15,000L of water before the straw/compost/topsoil medium requires replacing.

When biobeds are installed for practical on-farm use, there will be plumbed washdown pads with collection pits that collect the water and leftover chemical from washing down the spray equipment. From there, the mix will be pumped into the biobed system for filtering and breaking down the chemical.



Figure 1. Biobeds at Farmacist's Sandiford office.

## Where are they located?

Currently, three sites are in operation: two commercial farm sites, one in Koumala and one in Marwood, and one research site at the Farmacist Mackay's Sandiford office where the ability of Biobeds to degrade targeted chemistries is being investigated.

## Do they work?

Results received to date have shown that the biobeds do work. As an example, Figures 2 and 3 present results from the Marwood site for 2,4-D and Diuron.

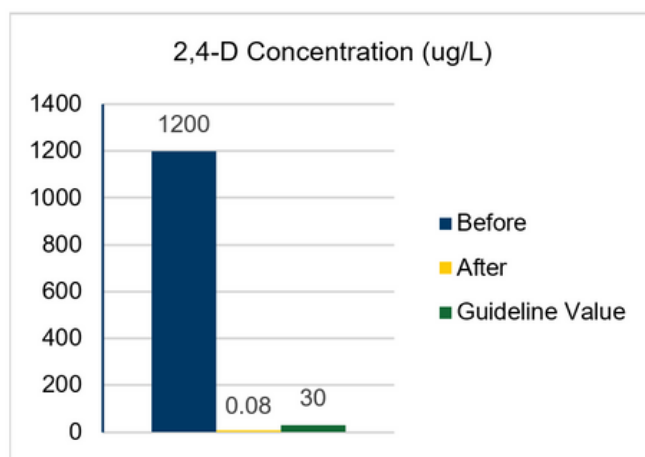


Figure 2.

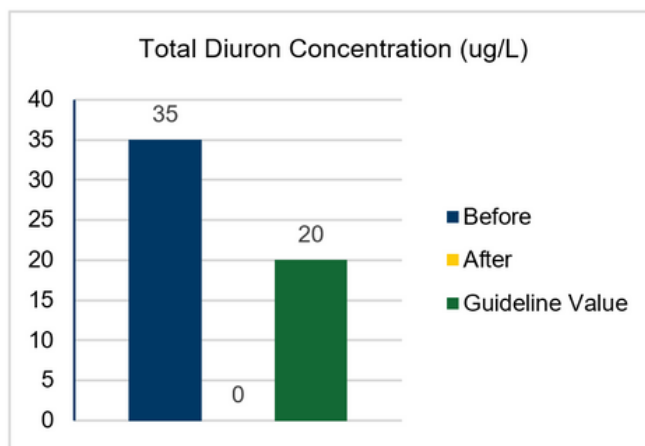


Figure 3.

Figures 2. and 3. Marwood biobeds. 2,4-D and Total Diuron concentration (ug/L). Before and after filtration, compared with Australian Water Quality Guideline value(s).

Prior to biobed filtration, both forms of herbicide were above Australian Water Quality Guideline values, and post filtration they were below guideline values. Diuron was further observed to be below detectable limits.

Although a range of factors need to be further investigated, in their current format biobeds are currently demonstrating great potential in improving the quality of water leaving cane farming enterprises. 🌱

# Managing microbes for better beef

By Jess Bennett

**What's in front of your cattle is an important factor in managing your herd, but more important is what's working inside them. Rumen microbes are one of the biggest players in determining the herds ability to maintain, grow, reproduce, and lactate.**

**In just 1 millilitre of rumen fluid, there are around 100 billion bacteria, 10 million protozoa and 10,000 fungi. That's a lot of bugs!**

## What are we talking about?

Have you ever bought cattle from a saleyard or gone through the weaning process and been surprised that after two months they are gaining little weight? It's a common experience that is explained by the microbes.

If an animal's diet is abruptly changed or they are placed on a low-quality diet that does not meet their intake requirements, the pH of their rumen will change, resulting in a rapid decline in the microbes in their gut.

When an animal is denied food for just 24 hours, its rumen microbes are halved! It takes up to 4 weeks to regain its microbe population.

If an animal is without feed for 48 hours, its microbe population plunges further, and it will take about 8 weeks to recover. It takes 10 days for the gut microbes to adjust to a diet change.

## Let's talk weaners!

Weaning calves is an important developmental stage that sets the stage for how animals will grow for the rest of their lives. During weaning, rumen microbes increase diversity and numbers at the fastest rate.

To compensate for the lack of milk, weaners require a diet that is high in protein and energy to support rumen development. Feeding poor quality hay to weaners will restrict microbe diversity, limit rumen development and hold back animal growth. 🌱



(Left): These weaners were managed for good rumen health and had a daily weight gain of 1.1kg.

(Below): The left-hand side is how much poor quality hay a weaner of 100kg would have to eat to gain 0.5kg/day; the small heap on the right is how much it is actually able to eat. (Source: Weaner management in northern beef herds, 2012)



(Left): These weaners were purchased from sale yards with poor rumen health (daily weight gain of 0.4kg).



## Don't bug out - we can help!

- Feed testing
- Faecal sampling
- Rotational planning
- Soil sampling
- Hay testing
- Grazing land condition management plans
- Record keeping books
- Planting legumes

Call (07) 4959 7075 to talk to Jess, Mandy, Laura or Chloe from the Farmacist grazing team today!

Resource:

Tyler, R., & Tyler, R. (2012). *Weaner management in northern beef herds*. North Sydney, Australia: Meat & Livestock Australia Limited.



# NSW tea tree "stump death" mystery

By Alice Moore

**Over the past 5 years, Northern NSW tea tree growers have been struggling with "stump death" - a condition of an unknown cause that has been slowly killing patches of plantations. These areas of stump death first appeared in 2018, and have been growing larger in size appearing in circles throughout the paddock which, for a permanent plantation, is a real issue.**

Since the first appearance of these patches there have been many schools of thought on the cause, with significant time and investment from growers' personal pockets to determine the cause but with no result. A grower on the southern side of Casino NSW investigated many different options to remediate these patches which are an agronomic nightmare; aside from a lack of production, there is also no competition from the crop which leads to infestations of weeds across the paddock.

Efforts to replant these patches proved unsuccessful due to the difficult establishment of tea tree seedlings within a mature crop. The grower settled on planting an interrow cover crop of tillage radish, which is thought to have biofumigant effects. The hope is that if the stump death is caused by a pathogenic agent, the tillage radish may be able to help remediate the ground.

After the tea tree were harvested (cut off at ground level) in January 2023, the paddock received a blanket post-harvest spray, followed by an application of spent leaf mulch from the distillery process, chicken manure and lime.

The tillage radish was planted and had very successful establishment across all parts of the paddock except for areas where the stump death occurred, in which case establishment was very patchy. Agronomically, the areas of stump death had still been treated exactly the same as the rest of the paddock so it was very unusual to us that establishment would be so patchy.

It was quickly ruled out that there could be any chemical build-up from spot spraying, a shading effect from the tea tree, or any other related physical reason that this could happen. The plants that did emerge in these "stump death" areas quickly started to become stressed, and started showing signs of disease.

The plant pathologists were quickly called to investigate and culture some samples of the tillage radish which returned mixed results. An initial culture returned some areas of a commonly found soil-borne fungus, while some of the more severe sections of the plants cultured a soft rotting bacteria.

Will these results help us to find the cause of the bigger problem - stump death? We certainly hope so. While it would be uncommon for a plant pathogen to target plants of the Brassica and Melaleuca species, it might help to point us in the right direction and confirm that it is an effect of a plant pathogen rather than a soil physical or chemical characteristic. 🌱



# Project POD presents to growers ahead of final intake this season

Zoe Egger, Farmacist's project manager for the Mackay region's precision ag project – Point Of Difference (P.O.D) – recently presented at a precision agriculture shed meeting on the 16th March at DMD Ag Solutions.

Zoe spoke about how different precision ag technology can be utilised to drive informed decision making while increasing productivity and profitability and, ultimately, water quality.

The project has a few spaces left for its final intake this season. Please contact Zoe on 0436 004 437 if you are interested.

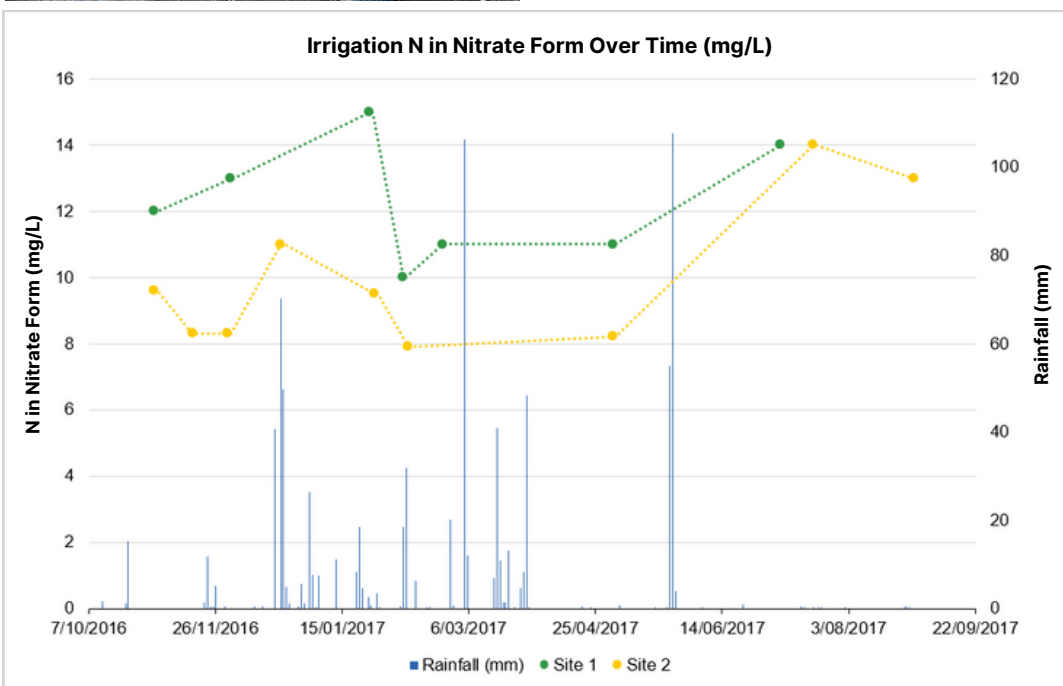


## Irrigation water sampling for Burdekin P2D growers

Wondering if nitrates in your irrigation water are negatively impacting your CCS? We can test for that! TriOs water sampling is free for Burdekin Precision to Decision growers under the project, and it is easy to test.

Underground water may contain nitrogen (N) in nitrate form that, depending on the concentration, could be impacting CCS. P2D has free nitrate sampling available to growers. Testing over time lets you monitor levels to better understand nitrate behaviour in relation to rainfall and peak fertilising periods.

The graph below shows the variation of sample results over time from two sites (7km apart – one on each side of the Burdekin River) in relation to rainfall. The data collected through past Project Catalyst trials highlights the importance of testing throughout the year. For example, a concentration of 10mg/L of N in nitrate form means that if you are applying 10ML of irrigation water per hectare, then you have an additional 100kg N/ha potentially available. Not all this N will be able to be used by the plant. However, to maintain a respectable CCS, some allowances in your fertiliser program should be made.



fertiliser program should be made.

If you think you have N in your water supply, contact your Farmacist agronomist.

The Point Of Difference and Precision to Decision projects are funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, and Farmacist Pty Ltd.



# Foliar sampling as a nutrient management strategy

By Hannah Van Houweninge

**Fertiliser management is an essential practice in sugarcane production. Product selection, timing of application, rate, and placement are all important aspects to fertiliser efficacy and good productivity.**

**As a grower, how do you make these management decisions to deliver adequate quantities of nutrients to the crop to maximise the yield in the most economically feasible way?**

One strategy that could help you evaluate the effectiveness of your nutrient management plan, and help you make sound decisions about your nutrients is introducing foliar (tissue or leaf) samples to your whole farm planning.

Firstly, it's important to note that foliar sampling should not be considered a replacement for your soil sampling program, rather it is a complementary addition to enhance your soil sample results. Soil sampling focuses on predicting your soil's ability to supply nutrients while foliar sampling is a diagnostic tool providing a snapshot of your crop's nutritional status at a certain time.

Leaf analysis can:

- Identify nutritional issues in problem areas of your crop.
- Verify the effectiveness of your fertiliser program. (Sugar Research Australia, 2013)
- Identify nutrient deficiencies that occur within the crop mid-cycle.
- Assess whether paddock conditions are causing nutrient deficiencies where a soil analysis shows no issues (e.g., waterlogging preventing nutrient uptake).



## Guide to leaf sampling

**When:** Leaf samples in sugarcane production should be collected between December and April when the crop is actively growing and aged 3-7 months. The sampling must take place at least 6 weeks after a fertiliser application and when the crop is not stressed by moisture or affected by disease or pests.

**How:** The 3rd leaf from approximately 30 stalks of cane is sampled across a block or area of concern (Sugar Research Australia, 2013). Prepare the sample by stripping the midrib out and drying all moisture from the leaf then send to an accredited lab for testing.

**Interpretation:** The results are best interpreted with an agronomist with knowledge of your farm and farming practices, soil type, tillage history, waterlogging problems and drainage, for example, which are factors that can influence your crop's growth (McCray, 2021). If deficiencies are found in any nutrients, nutrient availability in the soil should be checked along with paddock conditions.

The graph below illustrates a general nutrient response curve with nutrient concentration regions (sugarcane growth vs nutrient concentration in the leaf).

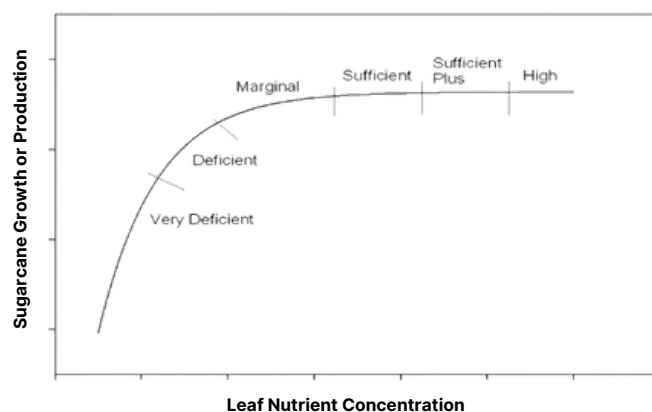


Figure 1. General nutrient response curve with nutrient concentration regions (J. Mabry McCray and Rao Mylavarapu, 2021).

The aim of applying fertiliser and ameliorant products is to ideally reach the 'sufficient' category for nutrients that your crop requires to reach maximum yield, as above this there is no further yield response and below this there is a much higher chance of yield decrease.

If crop nutrient levels fall above sufficient (sufficient plus and high categories) there is reason to consider reducing future applications of this nutrient. If there are nutrient values falling below marginal into a deficient or very deficient category there will be need to include or increase these nutrients in your next application (McCray and Mylavarapu, 2021).

When nutrient values fit into a marginal category your decision should be based on weighing the benefit of increasing the nutrient to sufficient values to increase crop production verse the cost to include this nutrient in your next application.

You should take into consideration your soil properties (highly organic, highly mineralised) and general constraints (waterlogging) when examining the cost/benefit of a future application of certain nutrients (McCray and Mylavarapu, 2021).

SRA Industry Standard Critical Values For Leaf Analysis		
Nutrient	Unit	Critical Value
Nitrogen (N)	%	- Nov to mid Jan: 1.9
		- Mid Jan to Feb: 1.8
		- March to May: 1.7
Phosphorus (P)	%	0.19
Potassium (K)	%	1.1
Calcium (Ca)	%	0.20
Magnesium (Mg)	%	0.08
Sulphur (S)	%	0.13
Copper (Cu)	mg/kg	2
Zinc (Zn)	mg/kg	15
Manganese (Mn)	mg/kg	15
Boron (B)	mg/kg	1
Molybdenum (Mo)	mg/kg	0.08
Silicon (Si)	%	0.7

Table 1. Industry standard leaf analysis critical values to determine if remedial action is required (Australian Sugarcane Nutrition Manual, (2018).



If you are considering checking your crop nutrient status with foliar sampling, contact your local Farmacist agronomist for a chat about your farm's sampling strategy - it could save your wallet! P2D and POD growers please contact your agronomist for further details on this service under the projects. 🌱

#### Resources

J. Mabry McCray (2021). *Sugarcane Leaf Tissue Sample Preparation for Diagnostic Analysis*. [online] IFAS Extension University of Florida. Available at: <https://edis.ifas.ufl.edu/publication/SC076> [Accessed 8 May 2023].

J. Mabry McCray and Rao Mylavarapu (2021). *Sugarcane Nutrient Management Using Leaf Analysis*. [online] IFAS Extension University of Florida. Available at: <https://edis.ifas.ufl.edu/publication/ag345> [Accessed 8 May 2023].

Sugar Research Australia (2013). *Leaf Sampling*. [online] Sugar Research Australia. Available at: [https://sugarresearch.com.au/sugar\\_files/2017/02/IS13014-Leaf-Sampling.pdf](https://sugarresearch.com.au/sugar_files/2017/02/IS13014-Leaf-Sampling.pdf) [Accessed 8 May 2023].

*Australian Sugarcane Nutrition Manual*. (2018). Available at: [https://sugarresearch.com.au/sugar\\_files/2017/02/GCM2307-Sugar-Research-Australia-Publication-Layout-F-Web.pdf](https://sugarresearch.com.au/sugar_files/2017/02/GCM2307-Sugar-Research-Australia-Publication-Layout-F-Web.pdf).



**The Precision to Decision Project is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.**

# Monitoring tea tree sprinklers with drones

By Eduardo de Lima Reis & Belinda Billing

The use of drones in agriculture is becoming more common and it's not surprising why. They are a powerful tool to precisely monitor crop development, helping growers to target management actions to increase yield and produce better crops.

Drones are useful across all types of agriculture and today we present a case study in the tea tree oil industry. Farmacist is currently working on the Agrifutures Tea Tree Industry Extension Project in both Northern NSW and the Tablelands in Far North QLD. One of our objectives is to help growers in this original Australian industry to find ways to reduce production costs and increase yield and efficiency. We have been exploring how drones can help achieve this.



Figure 1. Sprinkler distribution in a tea tree farm in Dimbulah, QLD.

## Irrigation Case:

In the tea tree industry in Far North QLD, irrigation is essential for the success of the crop. Most farms are irrigated by sprinklers spaced 15 to 18 metres apart. Each row could have 50 or more sprinklers in a 450 metres long stretch. Currently, growers walk or drive each row while irrigating searching for blocked jets or other issues impacting efficient wetting. Sometimes all sprinklers may be functioning, or the only jets that are blocked are on the last third of the row. In summary, a very long walk for often a very quick fix.

Following the suggestion of one of the tea tree growers, we flew and recorded a block during irrigation. We operated the drone at a safe height to avoid contact with the water and checked each sprinkler.

A flight at 20 metres and 3m/s (10km/h) produced a perfect view of each sprinkler and its status (working fine or faulty).

## Plan of Action:

Once the video was produced, the files were downloaded for the grower to watch the footage and identify each sprinkler requiring attention in the comfort of home or office.

It is possible to do this from the iPad/tablet while flying however this does require some multi-tasking and glare on the screen can make it difficult at times to see.

From the video footage it was very easy to identify each faulty sprinkler and mark it for attention on a map such as Figure 1. This approach does not require special software or training on the part of the grower, making it practical and affordable. It certainly helps to reduce the kilometres walked in the field.

However, we were not convinced that is the best use of the information. Recording the flight had negative aspects, such as reducing the battery

capacity, meaning the area covered with one battery is reduced and multiple batteries were required to fly one irrigation set.

An alternative strategy has been designed with the drone pilot reviewing footage on the iPad/tablet while flying over the irrigation set and taking a photo with the drone of the blocked sprinklers as they are identified. The image's approximated georeferenced location can then be used to create a map of sprinklers for repair.

Using the sprinklers distribution map (figure 1) as background, the location would be as precise as row number and sprinkler number, or how many metres to be walked in a specific row.

Checking sprinklers by drone in a block of tea tree during irrigation proved to be an accurate and practical solution for the growers when compared to the time they currently spend physically in the paddock.

Drones also provide the opportunity to monitor the crop without driving the tractor or other vehicle multiple times in the paddock. Every individual has a different capacity (financial, technical, time, etc.) to utilise technology, and exploring a range of approaches gives us the opportunity to identify various entry points.

Either way, this is a win-win situation, and we are enjoying problem solving together with the FNQ tea tree growers. 🌿



Figure 2. Perfectly working nozzle on sprinkler.



Figure 3. Faulty jet and leakage detected.



The Tea Tree Industry Extension Project is funded through the AgriFutures tea Tree Oil Program with the support of ATTIA Ltd and Farmacist Pty Ltd. This Project supports the adoption of innovation and research and development Australian tea tree oil industry.

# Real user reviews Farmacist Connect

By *Richelle Kelly*

**In the lead-up to the launch of our record keeping and farm management app, Farmacist Connect, we sat down with a grower who has been with us on this entire journey. His feedback, along with that of our other growers trialling the software, has been invaluable in shaping the app into a whole farm management and recording tool.**

## **Why did you decide to be part of the testing phase?**

They asked. Someone has to do it. I used to say to Billie that I hate telling them when there's something wrong, but if it helps make it better, then it'll be better.

## **What, in your opinion, are the best features of Farmacist Connect that growers would appreciate?**

You can do [your recording] right there and then while you're doing your job. You don't have to write anything down, you just put it in then it's there in your records. Then if they come to audit you, you have your records done and up to date. Easy.

My favourite feature is the watering app [irrigation records]. To do your BMP, you have to have all your watering records, and that's why it takes so long for a lot of people to do it. I've had this [app] since it came out, so when I did my BMP all my watering records were there. It makes it so much easier. Some blokes will go through their meters and say "There I watered" whereas I don't have meters because I'm not in that area.

I had my pumps measured by Farmacist, then you can work out from the flow rate how much is being put on with each watering. And now with the app, when you hit stop it tells you how much was put on in that watering.

## **What benefits do you think there are for using a digital record-keeping system/app?**

If you use the app, it's pretty good because you can do it [enter records] straight away, and even do it on the computer. It's just that you have to get used to it. And now you have to keep records, whereas before you never had to. But now with the regulations, you just have to do it.

And it's always with you on your phone. The watering feature I use when I'm in my buggy doing the watering. The other stuff I do at home on the computer.

## **How has a digital farm management app changed your day-to-day farming practices?**

Instead of looking through a notebook to see what you did last year or something, it's there – bang, and you can go straight to the app and bring up a record of what you've done instead of looking for a piece of paper or through a notebook for a date of fertilizing, or whatever. Now you can just check on the computer. The BMP lady asks questions and she wants to see everything and it's all there.

I use the home computer for entering chemical and fertiliser applications. Just never done it on the app, always used the home computer for it – it's just easier for me.

I have one farm and run 2 others, so they are all set up in the app and I can just change between farms to enter what I've done.

## **How does Farmacist Connect compare to other apps/record-keeping software currently on the market?**

Well it is still being developed, and not a finished product... Dylan is trying to make it simple for everyone so they use it. Dylan's not silly, he thinks about things. If you can make [the app] easy, people will use it. And Dylan is doing a good job of that.

I think it will fill a gap because it is, for me, able to be aimed more at cane. The others are either horticulture or cattle or broadacre. Cane is a row crop and this way I can focus the app for cane.

## **Would you recommend it to other growers?**

I tell everyone to get it for the "watering app". Sometimes you get busy and forget where you are up to, but with the watering app you have a record there of what was watered and when right in your hand.

The way things are going, whether you like it or not, you are going to have to have a record-keeping app of some sort, so you may as well have one that is focused on what you want.

Once it is set up, all your paddocks and drills are there, it tells you what you've done, you can change things around, it's good. And getting better.



Farmacist Connect is a purpose built, easy to use, spatial recording tool that makes farm records uncomplicated. Simply press on your block and record events for a variety of crops and farm management activities wherever you may be. Once data is entered, reports that meet current regulatory standards can be generated at the touch of a button.

With this single app, you can keep track of:

**Soil and EM data sets**

**Soil nutrition status**

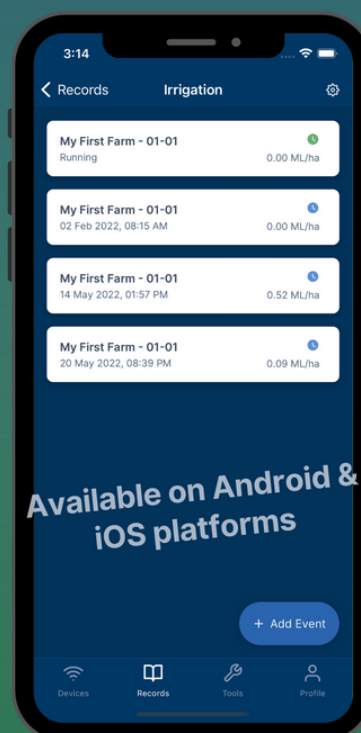
**Ameliorant prescription maps**

**Chemical and nutrient applications**

**Irrigation data**

**Whole farm management**

**Sugarcane, grazing, complementary cropping, and much more!**



The future of farming is digital and Farmacist Connect was designed to give users access to multiple digital layers of data on their farm to be used as a decision support tool. This data is not shared with any third party and all data is deemed to be grower-owned.

Contact your nearest Farmacist office or talk to your agronomist for more information about accessing Farmacist Connect.

# COMING SOON

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