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### From the director's desk

*with Tony Crowley*

(and Alice Moore)

Welcome to the latest edition of the Farmacist Newsletter. Farmacist has been busy in the months leading up to end of year rush and the articles that are within cover a broad range of activities that have been occurring up and down the Queensland and NSW coastlines.

I've been flat out chasing the dry weather across the east coast (more difficult than it looks) to try and get paddocks mapped with the TSM mapper for Norco Agri services under a Landcare project. This encompasses land spread from Bundaberg to Kempsey and west to Glenn Innes on a range of different crops including sugarcane, macadamia, tea tree, beef cattle pasture and dairy pasture.

As always, the TSM performed great giving us back some extremely beneficial maps for farmers that have never been exposed to this technology before. These maps will be ground-truthed with georeferenced soil tests and then, if required, can be processed into prescription nutrition or amelioration maps saving the farmer's back pocket. The rain chased us out of NSW before the mapping could be finished but I aim to be back down there before the end of the year for another attempt.

As always, your feedback is important to us to make sure we meet the mark with our newsletter content. Please follow our Facebook page to stay up to date with our latest research, workshops, events and much more!

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# Irrigating for Readily Available Water: What is it and how do we manage it?

By Nikala Passaris

Readily available water (RAW) refers to soil water that is easily taken up by the crop and makes up a small fraction of the soil's total water holding capacity. RAW sits between field capacity and refill point for a given soil type (Fig 1). As the soil water volume decreases in the soil, crop roots struggle to extract water fast enough to respond to transpiration demands and the crop begins to stress. That is, the crop exerts more energy to extract water from the soil than producing biomass. Crop stress limits yield potential so it is recommended to maintain soil water volumes within the RAW fraction to maximise productivity.

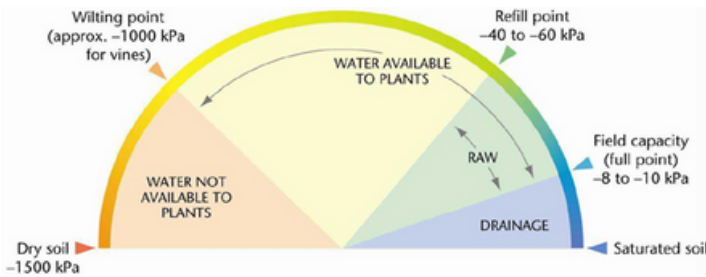


Figure 1. Soil water content measured by soil suction (-kpa). Readily Available Water (RAW) is the fraction of soil water between refill point (-40 to -60kpa) and field capacity (-8 to -10kpa). (NSW DPI, 2014).

Farmacist has been looking at RAW in more detail on our new farm in the Burdekin. Once the paddock had been TSM mapped, our agronomists sampled two soil cores to 1 metre depth, representing the two extremes of electrical conductivity across the paddock (Fig 2), and analysed changes in soil texture down the profile (Fig 3).

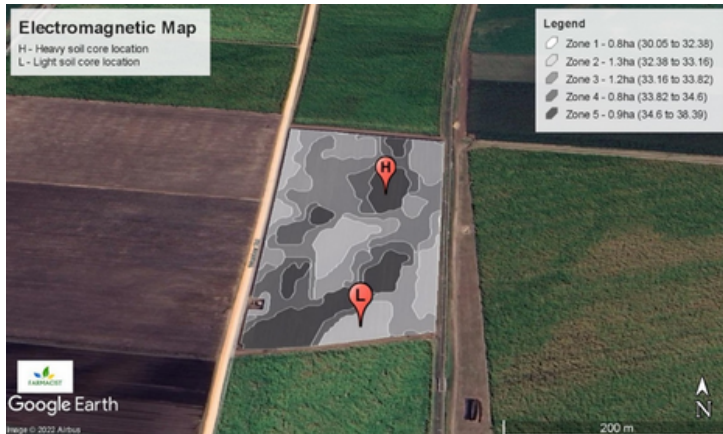


Fig 2. Electromagnetic farm map including heavy (H) and light (L) soil core locations.

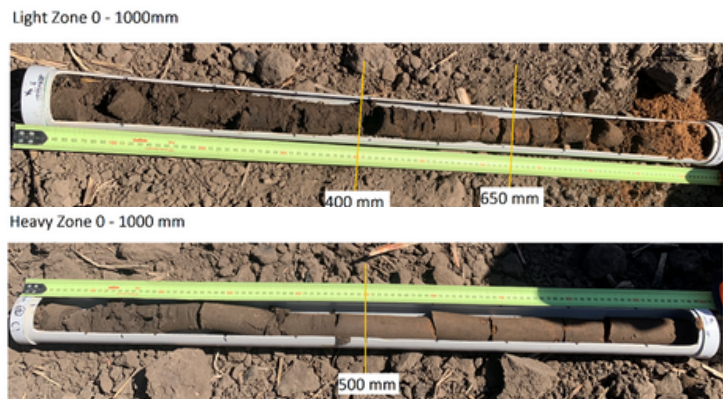


Fig 3. (Continued top of next column)

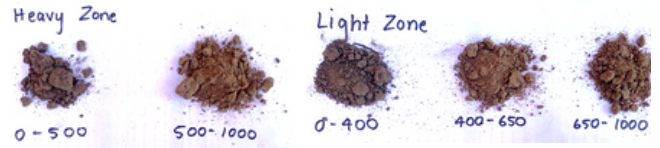


Fig 3 (cont.). One metre soil core in heavy and light zones of the paddock, indicated by electromagnetic soil mapping using our TSM machine.

Using a wealth of scientific agricultural resources, Farmacist has used the depth and soil texture of each layer and an assumed rooting depth of 1m (which is conservative for cane in unrestrictive soils) to calculate RAW. Farmacist has applied these RAW values to strategise an irrigation schedule to suit the farm.

And here are the results.

Light Zone		
Depth (mm)	Soil texture	RAW (mm)
0 - 400	Sandy loam	26
400 - 650	Sandy clay loam	10.65
650 - 1000	Sandy loam	22.75
<b>Total</b>		<b>59.4</b>

Heavy Zone		
Depth (mm)	Soil texture	RAW (mm)
0 - 500	Clay loam	32.5
500 - 1000	Light clay	28.9
<b>Total</b>		<b>61.4</b>

Table 1. Readily available water content of light and heavy soil zones. Comparison between in-house processing and the Department of Environment Science (DES) pressure plate testing.

Although the soil texture across this paddock varies, differences are not large, so it is not surprising that RAW values are similar. Given a 7mm/day average crop water uptake of fully developed cane with 100% canopy cover, applying approximately 60mm of irrigation every 7-8 days could be a suitable regime. If the ground gets too dry and drills are hard to get down, a shorter schedule could be used, so long as consideration is made to reduce the volume of water applied to stay within the RAW fraction. To confirm this schedule, growth measurements will be conducted to determine an appropriate irrigation trigger point.

Farmacist is striving to maintain yield while minimising water consumption to improve efficiency and reduce input costs. These are the very first steps to understanding the new farm's soil available water capacity and next up is to trial this new regime on farm to ensure practicality. Watch this space! 🌱

\* New South Wales Department of Primary Industries. (2014). *Determining readily available water to assist with irrigation management* (Primefact V14/3260). [https://www.dpi.nsw.gov.au/\\_data/assets/pdf\\_file/0003/531957/determining-readily-available-water-for-im.pdf](https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0003/531957/determining-readily-available-water-for-im.pdf) [Accessed 14/09/2022].

# The Benefits of Timely Soil Mapping

By Belinda Billing & Heidi Hatch-Gordon

**The recommended time to EM map and soil sample a paddock is directly after harvest prior to any cultivation, unless major laser work is planned for the fallow.**

It is recommended to take soil samples directly after final harvest prior to any cultivation. Tillage accelerates the breakdown of the organic material and increases mineralisation so you get a flush of nitrogen. This can lead to an artificial representation of what is available in your soil and also reduces the risk of picking up any old fertiliser bands. Sampling as early as is practicable also allows time for planning and accurate application of ameliorants.

For plant cane blocks, the Sugarcane Reef Regulations state that a soil test can be up to 12 months old before a new test is required. Work out the earliest date you are likely to plant and plan with your agronomist to test all next year's fallow blocks within 12 months of that time frame.

## Benefits of amelioration

For maximum utilisation, ameliorants such as lime, gypsum and lime/magnesium blends are best applied following plough out of cane and before the wet season. The products can be worked into the soil and the fallow period allows time for the products to correct pH and for any calcium and magnesium applied to become plant available.

Soil testing following harvest allows for the correct ameliorants to be applied at the required rate. An E43 (Nutrient Advantage) soil test allows for calculation of required calcium and magnesium, as well as lime or gypsum, rate to correct pH, aluminium saturation and sodicity. Without this information the important process of amelioration is simply guess work. Farmacist's Agricultural Advisors can recommend the correct application based on the soil sample report, as long as the analysis includes results for pH, aluminium saturation (useful in the far north and central region), sodicity, calcium and magnesium levels, and soil texture.



## Benefits for fallow crops

Growers planting legumes or other crops (cover or for harvest) will benefit from correcting all of these issues.

Legumes, sunflowers, etc tend to be more sensitive than sugarcane to issues such as pH, aluminium saturation and deficiencies in micronutrients. A pH below 5.8 will limit root growth, nodulation, plant vigour and nitrogen fixation in legumes such as soybean and mung bean.

Aluminium saturation should be kept below 15% for optimal legume growth (GRDC, 2016).

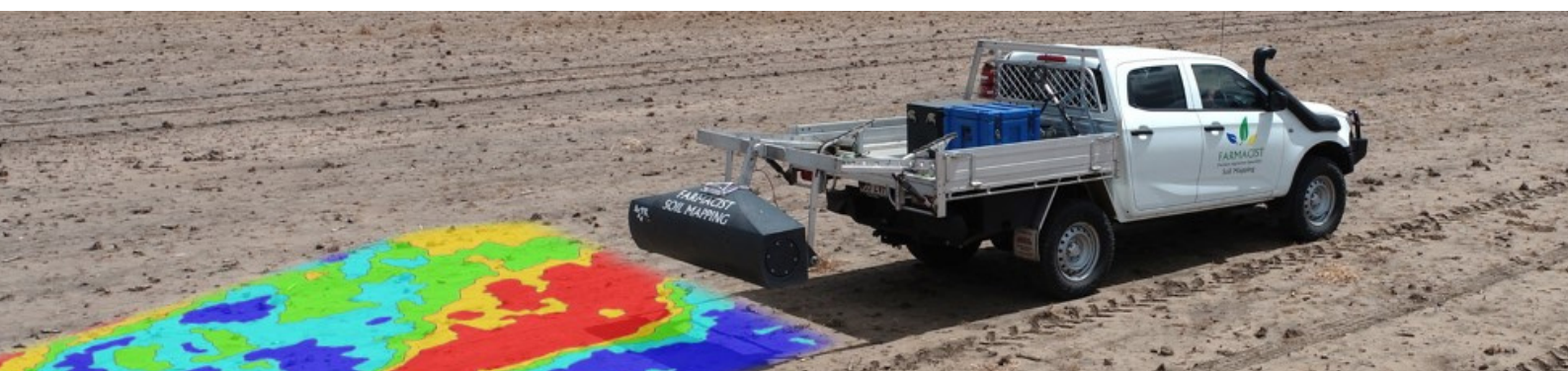
Sunflowers also require a pH at or above 5.8 and aluminium saturations of above 5% can impact vigour (GRDC, 2017).

For those growing multi-species fallow crops, correcting pH will increase diversity below the ground as well as increasing the vigour of the full range of species sown.

Most soil microbial communities require neutral pH to thrive with the optimal pH (water) range of 5.5 – 6.5. This is in part because this is the range within which plants thrive, ensuring a good supply of root exudates for the microbes to survive and multiply.

Strongly acidic or alkaline soils will favour select species, particularly bacteria, while being inhospitable to most soil microbes (Msimbira & Smith, 2020). Don't forget that any rhizobia inoculant applied to legume seed will struggle to survive in an acidic or alkaline environment.

A soil test will also provide a basis for any fertilising requirements for fallow crops. While inoculated legumes can supply their own nitrogen in the right conditions, they have requirements for phosphorus, sulphur, potassium, zinc and often other trace elements. Basing inputs on soil analysis will definitely put you in the right direction to create a better environment to grow your crop.



### Benefits for planning

A soil testing program that is completed before the end of December also allows plenty of time for planning and developing your whole farm nutrient plan and N & P budget. Fertiliser can be ordered early, price comparisons can be supplied and your agronomist can work with you to find alternative recommendations where needed.

The use of EM generated maps can reveal the in-field variability which can assist in determining representative sample locations within in field zones. Taking separate soil samples from zones of significant variation allows for variable rate ameliorant application and, in some cases, variable rate nutrient application. Geo-referencing soil test locations allows the monitoring of specific sites over time. Additionally, the GPS position remains constant even if the block number changes in the future.

Pachymetry spore counts should inform the variety of cane planted the following year. Ideally a pachymetry test will be undertaken two years prior to plough out, allowing time to propagate a resistant variety if required. However, if this has not been done you will have approximately six months to source a suitable variety.

### Take action!

Once your fallow plan is finalised give your agronomist a call to put together a sampling strategy. Remember it's best to take soil samples before the ground has been worked.

If you are a part of the Precision to Decision project in the Far North or Burdekin, or Point of Difference in Mackay, any soil tests beyond those required by legislation can be covered by the project to assist your move towards precision farming. If you have blocks with more than one soil type they can be EM mapped and additional samples taken to better understand the requirements of the block.



### Why is soil testing so important? Soil sampling is key to:

- Identifying soil nutrients or chemical factors that are limiting crop growth
- Improving productivity and profitability by putting fertiliser dollars where they are most beneficial
- Increasing fertiliser use efficiency by determining appropriate nutrient application rates
- Informing decisions and management tools for your whole farm nutrient plan
- Using effective ameliorants to improve possible physical and chemical imbalances
- Improving environmental protection by preventing over-fertilising
- Measuring changes in soil fertility and record trends over time

### Checking for pachymetra and nematodes

Before you plough the sugarcane crop in talk to your agronomist about testing for pachymetra and nematodes. Sampling is best done into the roots of the sugarcane where the pachymetra and nematodes are concentrated.

Analysis is done by Sugar Research Australia in Tully and sugarcane growers receive a discounted price. The information on nematodes can be used when selecting a legume species to plant. Most legume crops can reduce numbers of Root Lesion Nematode in the soil, benefiting the subsequent sugarcane crop. If the legume you select is not resistant to Root Knot Nematode and it exists in high numbers in your block, both the legume crop and following cane crop may suffer. Resistance information is available on common nematodes Root Knot Nematode (RKN) and Root Lesion Nematode (RLN).

Legume	RKN	RLN
Lablab	Highly susceptible	Resistant
Cowpea	Highly susceptible	Resistant
Meringa Cowpea	Moderately susceptible	Resistant
Soybean Leichardt	Highly susceptible	Resistant
Soybean – A6785	Resistant	Resistant
Soybean – Stuart	Resistant	Resistant
Soybean other cultivars	Highly susceptible	Resistant
Peanut	Highly resistant	Resistant
Velvet bean	Resistant	Resistant

*A guide to legume resistance of Root Knot Nematode and Root Lesion Nematode (Sugar Research Australia, 2022).*



**Precision to Decision & Point of Difference is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, and Farmacist Pty Ltd.**

# Broadleaf Weed Control in Soybeans

## - have a plan of action!

By Evan Shannon



Growers need to consider their weed control options as they approach the summer soybean planting period. *Ipomea sp* or "vines" are usually the biggest problem following cane crops. However, there are a number of herbicide options for consideration.

These herbicides can be used as either a pre-emergent or post-emergent application. For blocks likely to have very high weed pressures, the pre-emergent option should be preferred. This also offers the ability to apply post-emergent herbicide for weed escapes.

The main candidates for pre-emergent herbicides would be Imazethapyr (e.g. Spinnaker®) or Flumioxazin (e.g. Valor®). Under very high vine pressure Flumioxazin is probably preferred.

For post-emergent applications, Acifluorfen (e.g. Blazer®), Bentazone (e.g. Basagran®) and Imazethapyr (e.g. Spinnaker®) can be applied to soybeans (although only Acifluorfen can be applied post-emergent to mung beans).

Crop and weed stage, time of day and herbicide rate can all influence the weed control performance. In addition, some of these herbicides (e.g. Imazethapyr) have a plant back period, so it is crucial to have a plan prior to planting soybeans and to check with your local agronomist as to the suitability of the various herbicide options. 🌱



## Helicoverpa Eggs and Colour

Giving you time to prepare a plan!

By Billie White

As *Helicoverpa* eggs mature, they change colour from white to brown. Freshly laid eggs are white and become orange/brown prior to the larvae hatching. If you look closely enough at a brown egg, you can see the tiny larvae developing! Another fun fact about *Helicoverpa* is that their life cycle is temperature dependent – the warmer the daily temperature, the faster the eggs hatch and larvae move through their instars.

In a 2006 paper investigating the effect of temperature on *Helicoverpa* life cycles, it was found that at 20°C, it took 11 days for eggs to hatch, whereas at 25°C and 30°C it took 7 and 4 days, respectively (Bartekova & Praslicka).

When pest scouting, if you monitor the colour of the *Helicoverpa* eggs that you're finding and the daily temperature, you can assess how soon you'll have a grub issue and plan accordingly. Finding white *Helicoverpa* eggs in cooler weather suggests that you have some time before you need to act, however lots of brown eggs in summer suggests that there will be hatchlings on the horizon! 🌱



Barteková A., Praslička J. (2006): *The Effect Of Ambient Temperature On The Development Of Cotton Bollworm (Helicoverpa Armigera Hübner, 1808)*. Plant Protect. Sci., 42: 135-138.

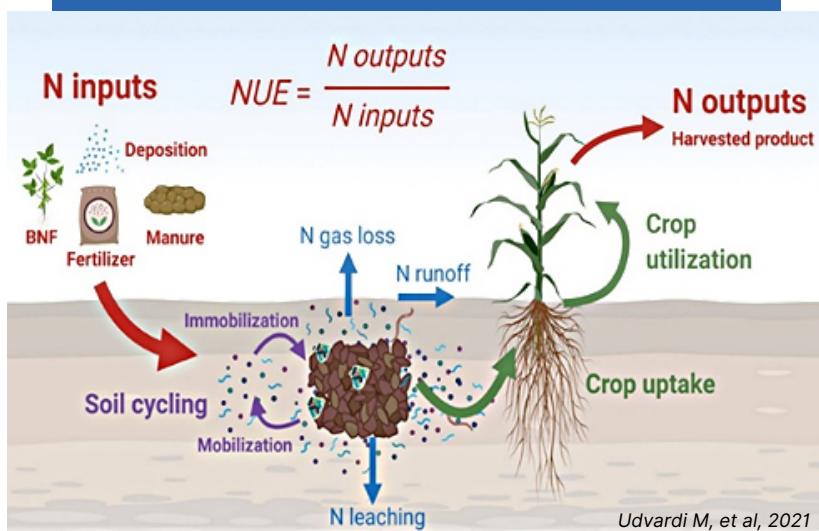
# Waterlogged Soils

By Jasmine Graham

When paddocks are waterlogged, soil conditions become anaerobic, meaning there isn't enough oxygen to supply the roots of the cane. The sugarcane plant usually responds by growing aerial roots and shallow roots. Research has shown that as a rule, 0.5 t/ha are lost for every day that the cane is waterlogged.

## The nitrogen challenge

In waterlogged blocks, nitrogen availability can become an issue. The nitrogen cycle displayed below is helpful for visualising the effect that waterlogging has on nitrogen loss in the paddock. When a soil is waterlogged, it changes the following processes in the nitrogen cycle:



**Increased denitrification:** High losses of nitrogen to gas form occur when the soil becomes anaerobic. Microbes in the soil use nitrates ( $\text{NO}_3^-$ ) as a source of oxygen, converting  $\text{NO}_3^- \rightarrow \text{N}_2$  (gas) and  $\text{O}_2$ .

**Increased nitrogen loss:** Nitrogen in its plant available form (nitrate) is mobile in water. Therefore, it is readily lost in waterlogged conditions.

**High organic matter soil:** Peats, swamps and low-lying areas that are waterlogged usually have high organic carbon. This increases the ability to immobilise nitrogen.

## Management For Waterlogging

- Various drainage options, levelling and row direction can be used to reduce waterlogging.
- High risk waterlogging blocks can be planted earlier so that the cane is not as young when experiencing waterlogging in the wet season.
- Cane can be grown on larger mounds and fertiliser should be applied only on the mound, to avoid both the roots and fertiliser having too much contact with the water.

## Rate

In high organic carbon soils, the 6 EASY STEPS rate is lower because organic matter releases nitrogen. In a dry year, these blocks yield very well because they have a steady supply of nitrogen being released slowly by the soil. In a wet year, most of the nitrogen that is not bound by the soil is lost to the environment.

## Climate

Climate forecasting can help with decision making around how much nitrogen to put on to waterlogging blocks. With an understanding that wet years are likely to result in lower yield and higher nitrogen loss, nitrogen rates may be able to be reduced for those years that are forecast to be wetter (La Nina).

## Fertiliser choice

Nitrification inhibitors are a good idea for wet blocks because it keeps the nitrogen in the ammonium form, which is less mobile but still available to the plant. SRA trials have demonstrated that during wet years, crops provided with nitrification inhibited nitrogen at 25% less than the 6 EASY STEPS rate yielded similar to cane provided with the full rate of regular fertiliser. Applying a lower rate of a nitrification inhibited fertiliser will provide the most cost-efficient option, especially in years when fertiliser prices are high. 🌱

**Increased loss pathways mean nitrogen deficiency can be a problem in these waterlogged areas. However, this issue is not easily solved by increasing nitrogen rates.**



\* Udvardi M, et al, 2021, A Research Road Map for Responsible Use of Agricultural Nitrogen, Frontiers in Sustainable Food Systems <https://www.frontiersin.org/articles/10.3389/fsufs.2021.660155/full>

# Powering your pastures: A resounding success

By Mandy Jeppesen

If you had to pick the profession that has the highest risk, you can't go much past agriculture. From floods, fire and drought to temperamental markets and global influences on price, it certainly isn't a job for the faint-hearted. However, rather than lamenting about what we can't control, we can reduce risk by focusing on the things that we can influence. For graziers, two of the fundamental aspects of beef production that we have greatest control of are pastures and animal nutrition. Both of these were discussed at the Farmacist "Powering Your Pastures" workshop held in August by the key presenters, Stuart Buck and Desiree Jackson.

Stuart Buck is a Senior Agronomist from Sown Pastures based at DAF in Rockhampton and works with landholders to improve their pasture establishment and management, and fodder quality.



Fig 1: Presenters at the Powering Your Pastures information session. (L-R) Katelin Reddacliff (Farmacist), Mandy Jeppesen (Farmacist), Stuart Buck (DAF), Desiree Jackson (DJLM), Laura Sluggett (Farmacist, and Polani Shadur (DAF).

Stuart's presentation focused, among other things, on the 5 key strategies for successful pasture establishment:

1. Buying quality seed of suitable species and not skimping on rate
2. Shallow sowing into a fine but firm seedbed free of weeds with subsoil moisture
3. Maximising water availability post-planting
4. Addressing any soil chemistry/fertility constraints
5. Controlling grazing until plants are well anchored/ set seed

Stuart is also heavily involved in monitoring pasture dieback across the state and developing management strategies to overcome its degenerative effects on pastures. He provided an update on current research trial outcomes and management options being investigated. Stuart also presented a new stylo guide available to landholders on the FutureBeef web site (Stylos in Queensland: An identification and suitability guide for graziers and advisers - FutureBeef).



Fig 2: Desiree Jackson from DJLM Pty Ltd presenting at the session

Measuring and monitoring soil constraints is an important aspect of pasture management that is largely under-utilised in coastal grazing. Soil sampling is seen as more of a requirement for cane farming, but it is just as important in determining whether your pastures will succeed or fail. Soil sample results presented by Farmacist showed a common scenario of low pH, low phosphorus and low sulphur in Mackay-Whitsunday pastures.



Sampling of pasture/hay and animal dung can be used to identify nutritional deficiencies in the animal's diet such as protein, dry matter, and minerals that can be rectified through supplementation. Farmacist are able to undertake sampling of soil, fodder and hay, and dung for faecal NIRS.

Desiree Jackson runs a livestock consulting business specialising in nutrition, reproduction and management performance, and was the final speaker of the morning. Farmacist staff recently attended a Nutrition EDGE course run by Desiree in Mackay and gained valuable knowledge from her extensive experience in the cattle industry.

Desiree discussed the importance of matching the animal's nutritional needs to their age and reproductive status, as well as methods of bridging the feed gap through supplementation and pasture management. She also stressed the significance of optimising and improving animal intake.

Farmacist received overwhelmingly positive feedback from the graziers who attended the information session. We'd like to express our gratitude to Stuart and Desiree for sharing their extensive knowledge and experience with the region's landowners.

Check out Farmacist's Facebook page and website to stay up to date on further information sessions and grazing events. Please contact your local Farmacist office if you have any questions about soil sampling, pasture/hay sampling or faecal NIRS sampling. 🌿

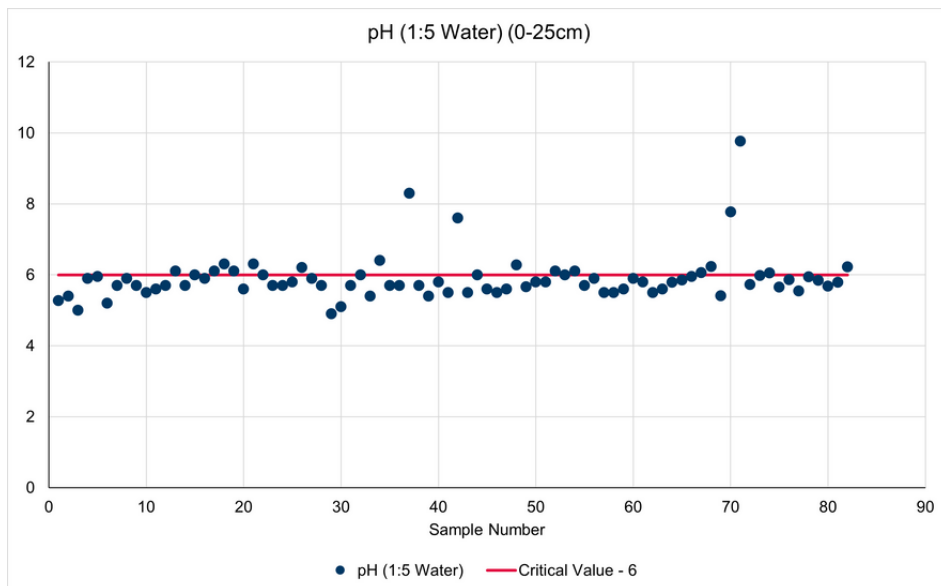


Fig 3: pH soil results for the Mackay-Whitsunday Region

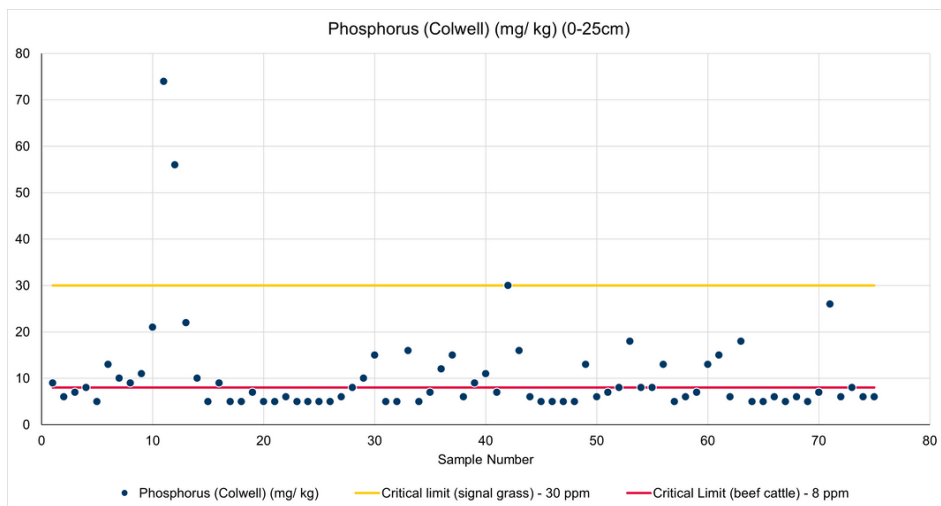


Fig 4: Phosphorus soil results for the Mackay-Whitsunday Region

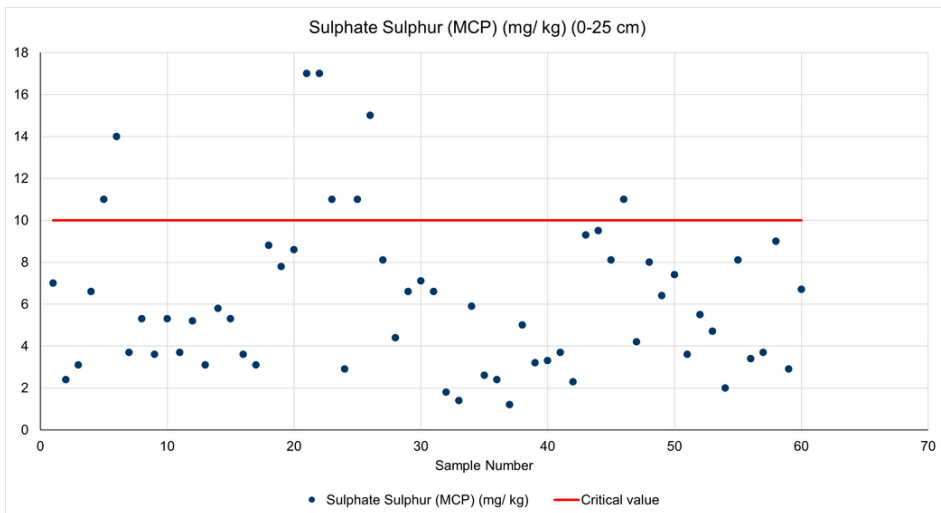


Fig 5: Sulphur soil results for the Mackay-Whitsunday Region

# Variable Rate Technology (VRT) Funding for our FNQ Sugarcane Growers

By Hannah Van Houweninge

North Queensland sugarcane farmer and planting contractor, Bruce Cotterill, has complete confidence that his newly upgraded DICKEY-John variable rate (VR) controller will provide ease of fertiliser application and precision accuracy, saving dollars in this world of rising fertiliser prices.

Mr Cotterill has received funding to help install a VR controller from the Great Barrier Reef Foundation (GBRF) via the Farmacist lead project, Precision to Decision (P2D). He is one of many local Russell-Mulgrave growers to be involved in the project that supports growers to make good agronomic and economic decisions on farm that will also underpin improvements to water quality. The project aims to use technology to refine nutrient management thereby improving and promoting precision practices like in-block variable rate fertilising. The goal is to improve farm profitability, efficiency, productivity, and sustainability.



Fig 1: Mr Cotterill using his new VR technology to plant.

"We are applying gold to our paddocks these days and we are using liquid gold to put it out!" Mr Cotterill stated. "Varying your product rate within your block with a touch of a button is a time saver and, most importantly, a money saver. It can be as easy as changing a few values like row space and product density on a screen and you can control your outputs precisely."

Mr Cotterill has used the funding to help cover the costs of a DICKEY-John Cambut Rate Controller. Since installing the technology, he reports fertilising is now as easy as setting the desired rate and driving. He now has the option of manually changing the rate from the cab or using a prescription application rate loaded into the IntelliAg from a VRT map provided by Farmacist. So far, he has opted for the manual adjustment. "When I come to cross a water-washed gully, waterlogged area or sand ridge section of the paddock I just drop the rate down 20kgs with a few touches of the screen and return to my full rate with ease," Mr Cotterill said.



Fig 2: Mr Cotterill's nutrient management plan in his tractor.

"Before it was like a guessing game, telling a grower they might need to order a bag or 2 more whilst you are planting for them. With the VR that never happens, you know exactly what you are applying which saves everyone time and avoids a headache," he said.

The DICKEY-John control system has been set up in Mr Cotterill's tractor and is compatible with his John Deere machinery and system. There have been very few technical issues and a positive experience dealing with the crew from Cambut so far. "The guys are fantastic, any technical issues you can jump on Facetime and a team member will walk you through the process - it is so easy!" Mr Cotterill said.



Fig 3: Far North sugarcane grower Bruce Cotterill with his newly updated DICKEY-John variable rate controller.

Russell-Mulgrave sugarcane growers who are interested in purchasing a variable rate controller or upgrading an existing system please contact Farmacist Gordonvale for further information. 🌱

# Plant Cane Pre-Emergent Grass Herbicide Demonstration Trial

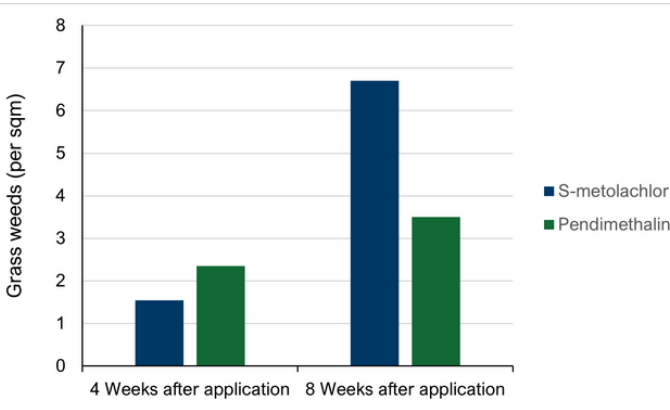
By Sarah Williams & Mika Rowston

## Trial Overview:

In the Burdekin, Project Bluewater has been undertaking a replicated demonstration strip trial to compare the efficacy and runoff capacity of two pre-emergent grass herbicides. Pendimethalin and S-metolachlor were applied at spike to 3 leaf stage plant cane on a fully irrigated clay loam block in the Burdekin. Both herbicides were applied broadcast with a flat-boom, S-metolachlor at a rate of 1.8L/ha and Pendimethalin at a rate of 3.3 L /ha. Both treatments also had Atrazine @ 1.5kg/ha applied for control of broadleaf weeds, in a total water volume of 275L/ha. The herbicides were incorporated by furrow irrigation 3 days post application. Weed counts were conducted 4 weeks and 8 weeks after application using randomly placed quadrats within treatments. In addition, specialised water samplers were installed in each treatment to measure the amount of residual herbicide lost in each runoff event. A total of 8 runoff events (irrigation and rainfall) were collected and analysed.

## Results:

Weed counts revealed that at 4 weeks after application, both S-metolachlor and Pendimethalin provided acceptable levels of grass weed control. However, by 8 weeks after application Pendimethalin was more effective at controlling grasses. This is a result of the breakdown of the product and also due to overall losses of the product to runoff and deep drainage.

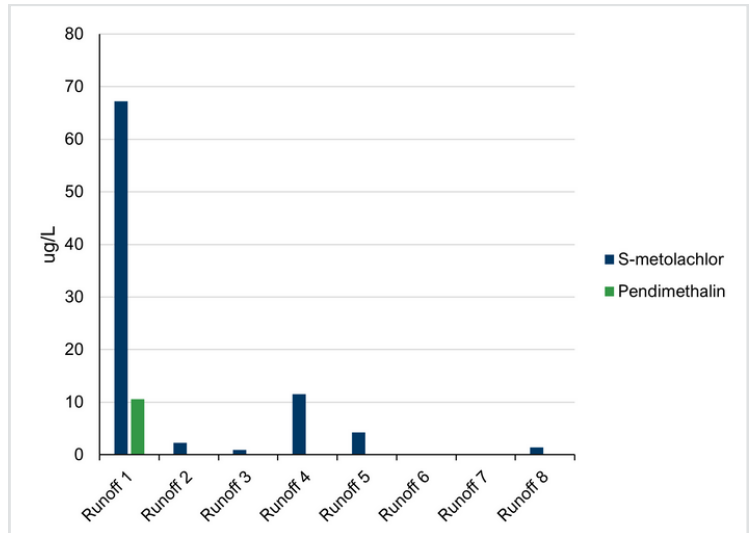


There was significant difference between treatments in herbicide runoff losses across multiple irrigation events (FIG).

Both herbicides showed the greatest losses in the first irrigation after treatment, with subsequently reduced losses with each sufficient runoff event. However, the S-metolachlor losses were significantly higher than that of Pendimethalin, which is to be expected based on the chemical properties outlined in Table 1.

## Paddock Overview

Region:	Burdekin - Jarvisfield
Soil Type:	Clay Loam
pH:	7
OC%:	0.73
CEC (meq/100g):	19.9
Irrigation:	Full flood irrigation



	Half-life in soil	Solubility	Soil binding	Runoff potential
Pendimethalin	100-182 days	Low	Very High	Very Low
S-Metolachlor	23-52 days	Moderate	Moderate	Moderate

Table 1 – Overview of the chemical properties of Pendimethalin and S-metolachlor. S-metolachlor has a shorter half-life, higher solubility and lower soil binding potential, these properties mean that it is more prone to runoff and deep drainage losses when compared to Pendimethalin. \*

## Summary:

While both herbicides are effective at 4 weeks, S-Metolachlor shows significant runoff potential, resulting in larger numbers of weeds by 8 weeks post application. Pendimethalin has a lower solubility in water and a far greater binding potential to organic matter, resulting in less runoff and better weed control. The runoff results also highlight the importance of managing the first few irrigations post herbicide application to ensure off-site impacts are minimised where practical.

It is important to note that if you choose to apply a residual herbicide, there are many other factors to consider. In addition to the information presented in the table above, the soil type, method of incorporation, timing of application, soil consolidation, droplet size, water rate, chemical rate, weed pressures and spray water quality are all things you need to consider to ensure you get the most out of your herbicide applications and reduce offsite losses.

\* GRDC. (2022). Pre-Emergent Herbicides Fact Sheet. Grains Research & Development Corporation. [http://grdc.com.au/\\_data/assets/pdf\\_file/032/575069/GRDC\\_PreEmergentFS\\_2022\\_Final-approved-version.pdf](http://grdc.com.au/_data/assets/pdf_file/032/575069/GRDC_PreEmergentFS_2022_Final-approved-version.pdf)



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# Farmacist Mackay Soybean Fungicide Trial

By Nick Hill

For the Queensland central and north coastal sugarcane growing regions, the recommended date for sowing soybean is mid to late December. When short season soybean varieties are used this allows for the early establishment of sugarcane. Anecdotal evidence suggests that soybean sown during December are more susceptible to Anthracnose (*Colletotrichum spp.*), a fungal pathogen that severely affected early sown soybean within the Burdekin in 2020.

An option for Anthracnose control within soybean is the application of Veritas Opti® upon display of symptoms. However, a potential issue is that the initial stages of Anthracnose infection can sometimes be missed, and this prompted Farmacist staff to ask the question:

**Can fungicide be applied preventatively to soybean at key growth stages with a subsequent control of Anthracnose and an associated increase in yield?**

Over the 2021-2022 summer fallow period within the Mackay sugarcane growing region, two varieties of soybean (A6785 and Hayman) were sown mid-December with four different forms of fungicide - two contact and two systemic. These were applied at key soybean reproductive growth stages: R1 (commence flowering) and R3 (commence pod fill).

A6785 was selected as it is noted as being susceptible to Anthracnose, however it is much sought after by processors and consequently attracts a premium price.

Hayman was selected as it is a commonly grown variety across regions due to its suitability to a range of markets.

Fungicides were selected based upon levels of fungal control and current usage across both the horticultural and grains industry(s) with fungicide treatments applied off label under APVMA Permit Number – PER 7250.



Fig 1. Farmacist Extension Agronomist Nick Hill.

To address this issue Farmacist established a trial under the Cooperative Research Centre for Developing Northern Australia; Developing an oilseeds industry for northern Australia project in consultation with QDAF plant pathologist Lisa Kelly.

Treatment effect was monitored via in-crop visual assessment over the season, collection of soybean pods at R7 (beginning maturity) with laboratory assessment of incidence of infection, and yield at time of harvest.

Crop inspection over the early part of the season visually identified no incidence of Anthracnose foliage infection, which was assumed to be due to the unseasonably dry monsoon season experienced in 2021-2022 (Mackay rainfall received from December through to March well below the long-term monthly average). Soybean pod sampling at R7 coincided with high levels of rainfall experienced in April.

Anthracnose infection was recorded in both varieties with significantly greater infection observed in A6785 than Hayman and no significant differences between the individual fungicide treatments observed.

Yield at time of harvest demonstrated no significant difference in tonnes of grain per hectare (t/ha) between varieties, however a significant treatment effect was observed (Table 1).

For A6785 both forms of systemic fungicide achieved significantly more t/ha of grain than the 0 control and for Hayman the systemic fungicide Treatment 1 achieved more t/ha than the 0 control. Although not a significant outcome, it can be observed for both varieties all fungicides achieved greater yield than the 0 control.

Variety	Treatment number	Treatment active	Yield (t/ha)
A6785	1	Systemic	1.59 a
	2	Contact	1.29 ab
	3	Contact	1.18 ab
	4	Systemic	1.58 a
	5	Control (0 treatment)	1.06 b
Hayman	1	Systemic	1.29 a
	2	Contact	1.14 ab
	3	Contact	1.13 ab
	4	Systemic	1.22 ab
	5	Control (0 treatment)	0.96 b

Note numbers followed by different letters are significantly different at the 95% confidence limits ( $P < 0.05$ ).

Table 1. CRCNA Developing an Oilseeds Industry for Northern Australia. Mackay soybean variety by fungicide trial. Variety by fungicide treatment, fungicide description and yield (tonnes per ha [t/ha]) at time of harvest.

**Although further work is required to determine economic benefit, effect of rate and the potential for contamination of grain via chemical residues, these initial results are promising and warrant further investigation so as to ensure grower confidence in soybean production in North Queensland coastal regions.** 🌱



# Queen of the Burdekin Farmacist Ambassador Jess Perks Crowned

By Richelle Kelly




When Jess Perks approached Farmacist to sponsor her on her Burdekin Water Festival journey, we could not imagine what an adventure it would turn out to be. The festival is one of the longest-running traditions in Queensland, celebrating the role of the natural resource in an agricultural community, and providing a great opportunity for fundraising and community involvement.

Together, Jess and the Burdekin Farmacist team decided it was only fitting for Cystic Fibrosis Queensland to be the recipient of the funds raised through activities Jess would undertake as an Ambassador, in honour of friend and Farmacist team member Simon Dunlop. Simon's life was sadly taken in 2020 and he left behind a beautiful family who deal daily with the affects of Cystic Fibrosis. Because of this, the Farmacist team wanted to donate to CFQ and their tireless support of families living with CF.

With Jess at the helm and the support of the Farmacist family, what followed was a crazy eight week ride. Jess attended the festival formalities and other entrants' fundraisers with boundless energy and a genuine excitement to be involved, and always with grace and a smile on her face. At the end of July, Jess' fundraiser "Clay & Rosé" was a blockbuster success at the Burdekin Potters Inc. The night could not have gone better and everyone left excited to receive the work they'd created in a couple of weeks when it was glazed and fired.

After a few more events, the night of nights arrived - the Water Festival Ball. Jess wore the Farmacist uniform with pride before changing into her gown for the presentations and speeches. Mika, Jess' partner and Farmacist agronomist, accompanied her onstage for the formal introduction. Once the speeches and pageantry wrapped up, the time came to announce the Ambassador of the 2022 Burdekin Water Festival. In a surreal moment, Jess was announced the winner! Jess was Queen! And Mika was excited to be King Consort by default. It was a glorious moment that capped off a whirlwind adventure. With the team there in support, celebrations followed.

As Jess' first official duty, she led the Grand Parade on Saturday at the Ayr Showgrounds. Under all the tinsel and streamers, you may recognise the Farmacist EM Mapping vehicle in the photo above. The theme was "super heroes" and Jess ran with that theme all the way to her musical mentors who she considers her personal heroes. Dressed as David Bowie and enlisting a friend to be Madonna, Jess lead the parade to the soundtrack of her favourite music and was tailed by our iconic red uniforms.

We sincerely thank Jess for choosing to represent us in her Water Festival Ambassador adventure - we could not be more proud of you! This truly was a team effort and huge thanks also needs to be extended to the Farmacist family who supported Jess and contributed in countless ways to make this whole experience an incredible success, one we were proud to be part of, and one we'll always remember. 

# Around the ridges





**Photos:**


- 1. Pre-emergent trial going down in the Proserpine/Whitsunday region.
- 2. Taking the first sample from the new bio-beds project.
- 3. Courtney from Nufarm making her way around Mackay region helping growers with suSCon placement.
- 4. Enthusiastic ag students getting involved at the Mackay Ag trade show.
- 5. Grower Michael (with Ash) planting his second consecutive multispecies crop.




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