Winter 2020

Fertilizer News

Challenging times over the past few months

By Eddy Pol
Executive Manager – Marketing & Sales.

The last few months have seen many challenges for us all, as the community has dealt with the outbreak of COVID-19.

Summit Fertilizers promptly made decisions to ensure our business could continue to operate during this time. A clear focus was on protecting staff from infection, especially our despatch and operations team. To manage this, our customer service team moved to phone or two-way radio to communicate with carriers, and all documentation was delivered electronically. Drivers were asked to remain in their trucks while at our fertilizer depots.

The sales team, including our Area Managers worked from home and travel was limited to essential visits only, to lower the risk of infection to our staff and customers.

Fertilizer supplies were not impacted as all our fertilizer products, except urea, were in storage before the outbreak. Urea shipments to date have not been impacted during loading or sailing.

There was a rush in demand from customers to pick up their seeding fertilizers from mid-March and with extended hours, all were supplied prior to seeding without any issues.

Generally, there has been limited impact on international fertilizer markets as a result of COVID-19, and any changes have been driven by supply and demand.

Considerable investment in phosphate and potassium production has occurred in the past 10 years and this has led to historically low international prices. Urea has traded at values below the average price over the last three years.

The biggest variable in recent months has been the volatile Australian dollar against the US dollar.

The rapid decline to 57 cents in mid March would have led to markedly higher fertilizer prices compared to a 65 cent exchange rate, but that fall was short lived.

Summit Fertilizers did reduce the trials program in 2020 due to travel restrictions under COVID-19, however has ensured trials on key nutrients have been maintained to ensure we generate information for dissemination to growers, and to provide better response curve information in inSITE.

Area Managers will be available for on farm visits and putting out Fuel Gauges during the growing season, but all farm visits will be made with consent from the customer, and social distancing will be adhered to.

Summit has been able to continue to provide fertilizer and nutrition advice to customers in the last few months and the plan is to continue to do that in the months ahead.

Inside this issue!

June 30 reminder!

Our Summit Fertilizers June 30 2020 offer finishes at the end of June. it includes:

- Up to 13 months free fertilizer storage to the end of July 2021.
- A 2020 financial year tax invoice.
- A $2/tonne rebate on Summit inSITE soil and plant testing for next season.
- Assured product supply.
- Fixed pricing for peace of mind.

Field Research team up for the 2020 challenge

Every year seems to lay down its own unique set of challenges and opportunities and it is fair to say the start to the 2020 season has presented sizable hurdles for the Summit Fertilizers' field trial program.

Keen to build on the results of previous seasons, the research team had to be flexible and adapt to a situation of Covid-19 uncertainty and lockdown. Fortunately, persistence is a virtue and the team is to be commended on doing a great job under difficult circumstances. It's pleasing for Summit to be able to inform growers that the 2020 trials program is well underway and continues to extend across the State.

Thanks go to the efforts of team members like Saritha Marais, who temporarily relocated to Merredin to navigate the issues of travel bans between regions. That move helped the program flow so much easier. Given the circumstances, the team has shown remarkable resilience and with a successful 2019 trial program behind us and hopefully a good season in front of us, we look forward to another season of growth.

Over the past few months too, the team has seen some changes. Jack Pages-Oliver has joined us, and we farewelled Harley Royce who left for the Eastern States.

While no one can know for sure what will unfold in the immediate future, we have prioritised our trials program to ensure important trials that generate data relevant to progressive WA farming systems, can still be carried out.

Keeping the community safe as well as managing risks for our staff will remain of upmost importance.

The 2020 program should produce further data on the following key themes and questions:

- Continuation of our soil potassium extraction methods and interpretation work.
- Short and long-term comparisons of potassium forms and placement for cereals and broadleaf crops.
- Expanding the investigation into manganese supply in contemporary cropping rotations.
- What is the current state of play for phosphorus requirement of new high-yielding mid and long-season wheat lines with different times of sowing?
- The opportunity for early sown winter wheat and the role of different P and N nutrition in best practice management.
- Yield Apex Nitrogen Cereal (YANC) series for realising genetic potential of popular current wheat varieties.
- Local phosphorus soil test and rate responses, alone and in conjunction with factorial nitrogen and potassium rates.
- Seed barley nutrient profiles and subsequent crop performance.

The Summit field research team is especially appreciative to the cooperative host farmers who have offered enormous help to us in getting trials set up and established on their land. Thank you!

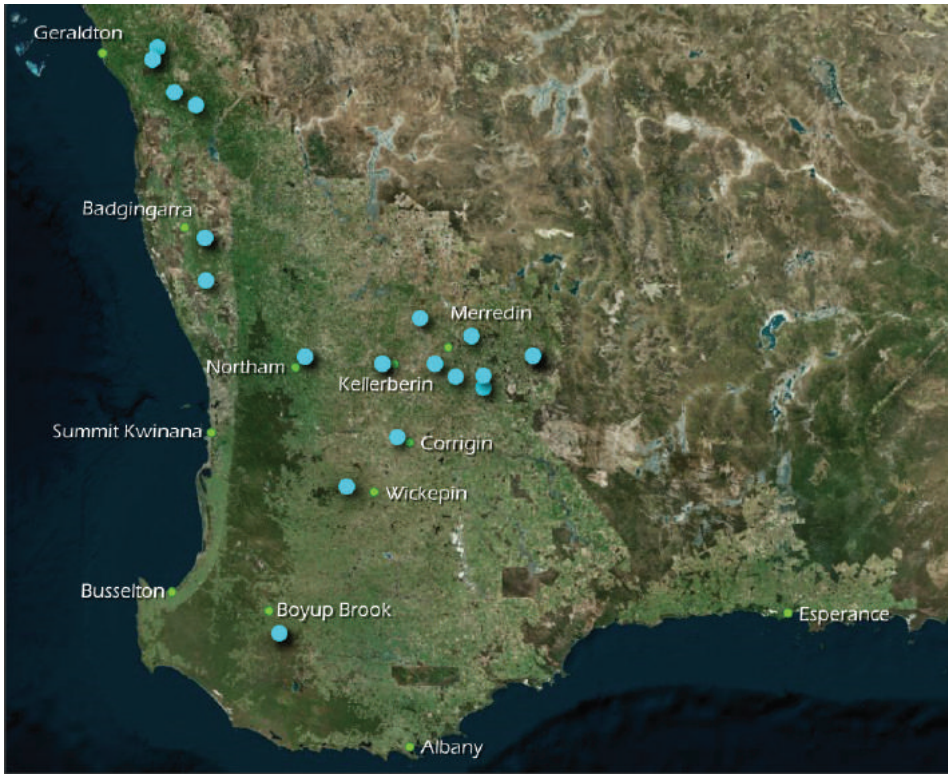
Without this assistance in an already difficult climate for logistics, we would have been even more limited in what we could do and the data we could generate to help all our clients make better fertilizer decisions.

We remain hopeful we will have the opportunity to show these trial sites in-person as the season progresses.

If not, follow us on twitter for the latest updates and keep in touch with your local Area Manager for all the data and information that will flow from the 2020 trial program.

Without the co-operation and assistance of growers like Michael Wanless (above left) of Muntadgin, the difficult logistics of setting up a trial program in WA in early 2020 would not have been possible. Summit appreciates the efforts of these people in helping us get trials set up and established on their land. Thank you!

Summit Fertilizers is a big investor in WA crop nutrition research. The picture above shows Saritha Marais hard at work setting up a trial out at Muntadgin earlier his season. It may surprise some growers as to the scope and depth of our trial results. More information can be viewed at the Summit Website - go to the Field Research section. Below is a map of 2020 broadacre trial sites.



Jack Pages-Oliver joins our research team

Summit is delighted to welcome Jack Pages-Oliver to our Field Research team.

Originally from Denmark WA, Jack graduated from UWA in 2018 with a Bachelor of Science degree, majoring in Agricultural Science.

He started with Summit in April and says he has enjoyed working in a team environment to prepare and carry out a range of trials this season.

Outside of work Jack enjoys playing football, fishing, camping and travelling.

inSITE plant analysis

In the coming weeks, plant analysis will be an invaluable guide as to whether specific nutrients are limiting the growth of your crops and pastures.

Plant analysis is especially useful as often there are no visual signs of a nutrient deficiency (hidden hunger) early on. Unlike soil testing, which predicts how much of each nutrient is likely to be available, plant testing reflects what's actually available to the root system which can help to fine tune the fertilizer strategy.

Key benefits of Summit Fertilizers inSITE plant analysis are:

- Independent laboratory
- Rapid turnaround times
- Wide range of nutrients measured
- Area Managers are trained in the best plant sampling techniques
- Results can be viewed on SummitConnect

For more information on Summit inSITE plant analysis, growers should talk with their local Summit Area Manager.

Get the best 'bang for your buck' from nitrogen

Western Australian broadacre farming is continually evolving to improve management logistics and economics. A result has been a large shift to continuous cropping, with canola largely replacing lupin crops due to the potential for higher cash returns, and the absence of pasture phases from many rotations.

Fewer legumes in rotations has had an impact on a number of aspects in the soil related to nitrogen (N) supply for crops. One of these aspects is a decline in soil organic matter – which is a major source of N for plants as it breaks down (mineralises).

As an example, if we look at all soil samples analysed by Summit between 2015 to 2019 from the Midlands region, 87% of sites showed organic carbon levels below 1% and 31% of sites were below 0.5% (Figure 1). This is considered very low.

Breeding programs are developing increasingly high-yielding seed lines. If soil-based N sources are not sufficient to meet crop demand, fertilizer N is required to make up the difference to achieve yield potential.

There is an emerging train of thought that traditional approaches to management are leaving crops deficient in N and this is evidenced by disappointing grain protein levels in recent seasons.

Growers may be forgoing profit by playing the season late and not addressing crop N demand early when yield potential is critically set.

Strong links between N availability, uptake and conversion to protein during grain fill mean timing of N applications can also impact grain quality and delivery grade, which can substantially influence grower returns.

The question then becomes "what things can we do to maximise N-use efficiency?"

Summit's Field Research team established a trial at Dandaragan in 2019 to assess a number of strategies to identify N application rates that best matched site conditions and Scepter wheat yield potential.

Various N rates at multiple combinations of timing splits provided a range of contrasts to assess the impact on yield, grain quality and profit.

Timings included applying the majority of nitrogen:

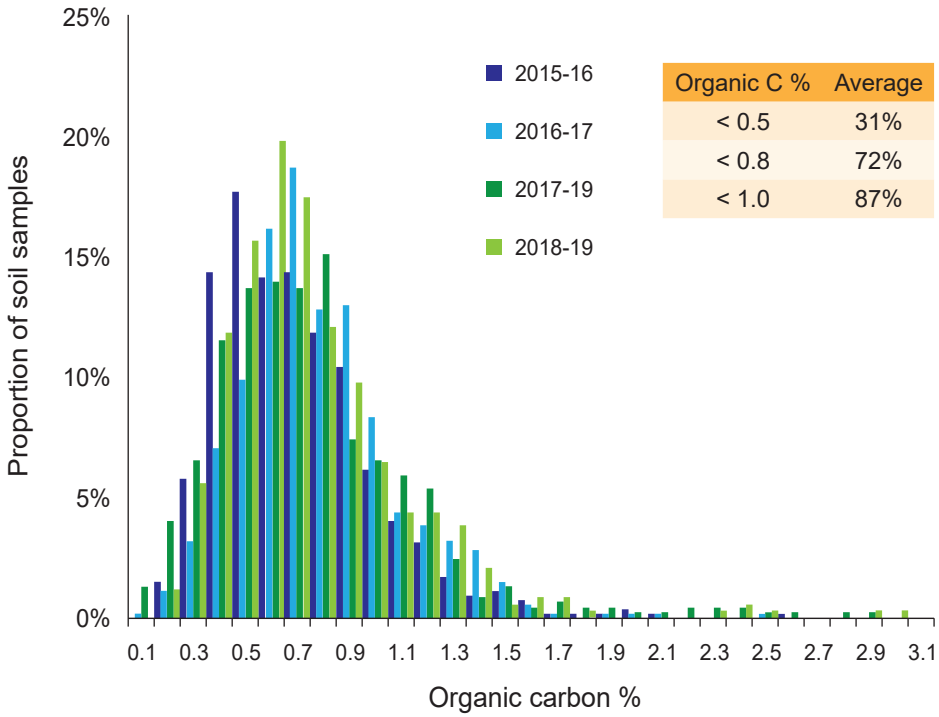
- At sowing (N-Rich strip)
- 'Early' - 5 and 8 weeks after emergence (WAE), approximately Z24 - 4 leaf stage and Z31 - mid tillering
- 'Late' - 8 and 12 WAE (approximately Z31 and Z41 flag sheath extending)
- 'Constant'- at sowing and fortnightly from 5 WAE (to Z51 - awns visible).

From early in the season, biomass assessment indicated a plant growth advantage to having higher proportions of N applied at sowing and in the early plant growth stages. This trend continued into harvest yield with a yield advantage to applying nitrogen earlier.

Key results

- Yield responses of up to 2.5 t/ha were seen from N application.
- The N-Rich strip, 110 kg N/ha at sowing, plus 70 kg/ha by 8 WAE yielded highest at 5.5 t/ha, followed by 'constant' N supply to 205 kg N/ha total and 'early' N of 190 kg N/ha, both at 5.3 t/ha.
- At every equivalent rate, early N application out-yielded late application and the trend was significant ($p<0.05$).
- Late applied N did show slight advantages in grain quality. Grain protein across the trial ranged between 9.4% and 11%, and significantly ($p<0.05$) increased with both rate and lateness of applied nitrogen.
- Applying nitrogen early (5 and 8 WAE) indicatively returned $90 to $150/ha more profit than applying late (8 and 12 WAE).

The trial data showed that applying higher rates of N later in the season did not increase yield to the levels achieved when N was applied early – i.e. at sowing or early in the season.



Organic C %	Average
< 0.5	31%
< 0.8	72%
< 1.0	87%

Figure 1. Soil samples taken from the Midlands by Summit's inSITE soil analysis service over the past 4 summers show a heavy weighting to very low organic carbon levels. Potential mineralisation and supply of N from these soils is insufficient to meet demand of even a moderate growing crop.

Late applications require more N to catch earlier applications in yield, but are then at an input cost disadvantage.

Loss of yield potential early in the growing season is difficult to regain without high inputs and favourable conditions that allow the high inputs to have an effect.

So, leaving nitrogen decisions until late can both lose yield potential and require higher cost to maximise it from that point.

Take home message

Greatest nitrogen use efficiency and return on investment is seen from early applications of nitrogen. Such applications avoid crops reaching a point where demand begins to outpace supply, even before any deficiency symptoms are observable – otherwise known as 'hidden hunger'.

Growers should consider a substantial proportion of their nitrogen applications early in the season, to fit with their yield target and risk management approach to avoid this hidden hunger negatively impacting their crops' yield potential.

Figure 2A.

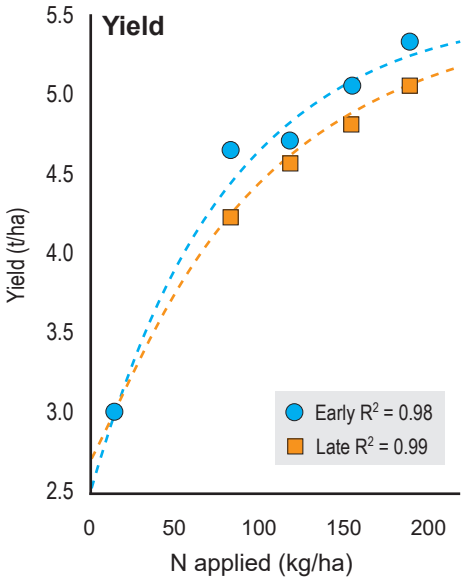


Figure 2B.

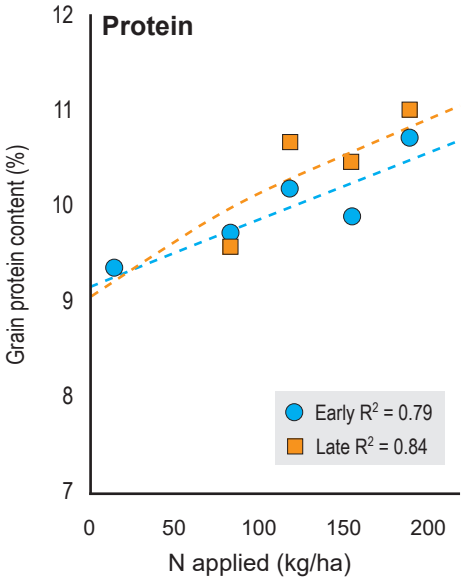
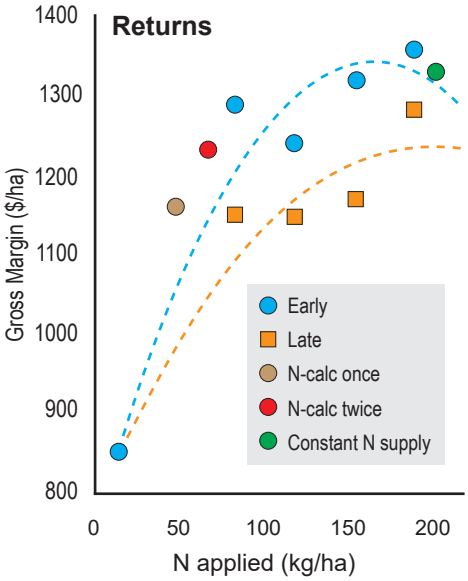


Figure 3.



Figures 2 A and B. Comparison of early and late in-season N application on the yield and grain protein accumulation of Scepter wheat.

Figure 3. Profits increased with applied N and closely mirrored yields. Gross margins show an economic advantage to applying N earlier in the season and the efficiency of the N-calculator on producing returns from guided, but conservative N applications relative to higher rates applied late.

Dandaragan 2019 trial treatments

Treatment	At Sowing*		Up-front total N kg/ha	Post-emergent UAN applications					Total trial N rate kg/ha
	Urea Banded kg/ha	UAN PSPE L/ha		5WAE Z14 L/ha	8WAE Z24 L/ha	10WAE Z31 L/ha	12WAE Z41 L/ha	14WAE Z51 L/ha	
N15			15						**15**
N85 Early			15	85	85				**85**
N120 Early			15	85	165				**120**
N155 Early			15	165	165				**155**
N190 Early			15	165	250				**190**
N85 Late			15		85		85		**85**
N120 Late			15		85		165		**120**
N155 Late			15		165		165		**155**
N190 Late			15		250		165		**190**
Constant-supply N	35		30	85	85	85	85	85	**205**
N-Rich strip		225	110	85	85				**180**
N-Calc reco	35		30	43					**48**
N-Calc reco x2	35		30	43		48			**68**

**Basal fertilizer at sowing 150kg/ha Vigour-Mn + 30kg/ha SOP: N 15, P 20, K 25, S 10, Cu 0.1, Mn 1.5 kg/ha*

New partnership brings satellite NDVI imagery to clients

Summit Fertilizers is pleased to update growers with the exciting news of our strategic and cooperative partnership with DataFarming, an Australian precision agriculture company. DataFarming is based in Toowoomba, Queensland and delivers leading digital solutions to customers around the world.

Formalised in the past few months, this partnership will extend the Summit Technical Services package to clients.

Established in 2017, DataFarming is owned and operated by Australian precision agriculture specialists, Tim and Peta Neale. They have a cloud-based platform that amongst a host of other things, provides regular access to NDVI (normalised difference vegetation index) satellite maps.

Summit clients can now take advantage of their 10 x 10 metre resolution NDVI images through the SummitConnect user platform free of charge. It really is a simple and yet powerfully streamlined addition to our user interface tool.

These NDVI images are updated at least every 5 days for continuous in-season monitoring and can even be accessed back to January 2017. For growers with paddock boundaries already loaded into inSITE, they can overlay their soil analysis data.

Area Managers and growers can use the satellite maps to:

- Monitor crop and pasture health.
- Pinpoint on-ground issues, dry matter and crop or pasture quality.
- Identify problem areas prior to soil or plant testing
- Save time and money knowing where to best target fertilizer applications.
- Track a person's location in-field while crop scouting, or,
- Select a regional view for a broader look at the local area.

"Summit has long held the view that a properly implemented soil and plant analysis program is the best foundation for building more informed nutrient application decisions," says Dr Mark Gherardi, Summit Field Research Manager.

"And to that end, it's important to identify what you've got before you can truly determine what you need. It's why we developed our Summit inSITE platform, to better enable growers broader access to their soil and plant analysis data, underpinned by field research-based models and presented on the simplest and easiest available user interface.

"Combining our laboratory analysis data with remote sensing information was a logical step for us. However, if not handled with care it can generate a lot of complexity which can make it overwhelming, or it can be a time consuming task that produces splendid visuals with animations that make much of the data seem more complex than it needs to be.

"While Summit are experts in crop nutrition, we are not experts in remote sensing and through a mutual agronomy services contact network, we were introduced to Tim.

"DataFarming has a goal to make accessing and benefiting from precision agriculture technology as easy as possible and in doing so, break down some of the barriers for farmers to adoption.

"We see our businesses as being very complementary and a cooperative partnership seemed like a perfect match.

"DataFarming share our philosophy with regard to digital technology and integrating the technology into usable agricultural practices;

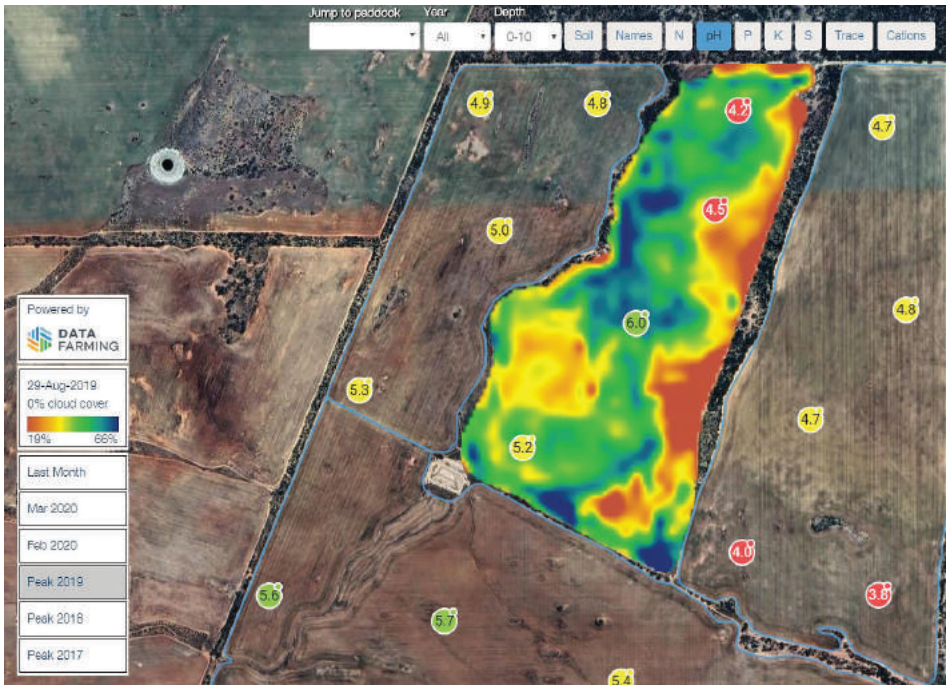
- Usefulness at the core
- Simplicity over 'bells and whistles'
- Affordable
- Pay for what you use rather than lock-in subscriptions

"We believe the Summit Fertilizers - DataFarming partnership is a fantastic opportunity for growers who are on any part of their journey with precision agriculture.

"It may be as simple as looking to gauge some near real time feedback, or historic analysis of the relationship between soil nutrient testing, fertilizer applications and crop and pasture growth.

"There are exciting developments in the pipeline that will take this partnership to the next level and provide low-cost, cutting edge tools based on research and data science to growers to enable data driven decisions in the simplest possible way. Stay tuned!"

DATAFARMING



In an exciting new development, Summit customers can now view NDVI images updated at least every 5 days through our partnership with DataFarming.

Q&A with DataFarming

On the news of a strategic alliance between Summit Fertilizers and DataFarming, we asked DataFarming Managing Director, Tim Neale, to provide his insight into his company's strengths and the partnership.

DataFarming Managing Director - Tim Neale

Q. What is the overall vision/goals of DataFarming?

A. Our aim is to take precision agriculture (PA) from boutique to mainstream – and to massively increase adoption. We want digital technology to be a part of daily agronomy activities to improve efficiency and reduce crop variability, and ultimately provide greater returns for growers. Most paddocks in Australia typically vary at least 300% in yield. There is a lot of opportunity to reduce this variability and this starts with quantifying the problem and ground truthing; which is where technology can help. Our platform already has 16,000 farms and 80,000 paddocks using satellite imagery – mostly in Australia. Growers and agronomists really want this data, it just needs to be provided in an easy to use and cost-effective manner.

Q. How do you think partnering with Summit will help?

A. Partnering with Summit provides a fantastic pipeline to the market due to the close connection that Summit has with WA farmers. Trusted advisors are key to getting this data used on the ground – and they are the ones helping growers most. The products that DataFarming have developed fit very nicely with Summit's offering as well. We offer simple tools to determine soil and tissue sample locations, as well as variable rate fertilizer application.

Q. Why do you think Summit is a good partner?

A. Summit is a well-respected company that has great presence in WA and is a leader in the market. The development of Summits' new software allows the integration of tools such as regular NDVI satellite imagery, and in the future auto-zoning for variable rate prescription. Soil and tissue sampling need to be targeted. The days of bulk sampling are over. DataFarming also work closely with APAL labs, which completes the loop for farmers in WA who use Summit.

Some of the NDVI opportunities

Normalised difference vegetation index or NDVI as it is more commonly known, is all about identifying variability and it is a very useful tool for identifying differences in vegetative growth. Differences can be large or small, but very discernible as a vegetation index when, sometimes, differences are not visible to the naked eye. On their own, these differences and their distribution can be used to:

- Detect areas of stressed crops and areas of concern
- Identify high to low performing areas
- Track plant health
- Monitor drought and assist in fire hazards risk assessment

Combined with other data, tools and models, NDVI can be used to:

- Estimate yields
- Predict optimum fertilizer requirement at a given point in the season (e.g. with the Summit N-gauge system)
- Create variable prescription maps (for all sorts of things, including fertilizer)
- Relate performance to historical factors (soil nutrient analysis, fertilizer use, weather, management practices etc.)
- Compare particular time frames of performance or averages with current status

One of the things that DataFarming provide is rapid, automated, smoothed NDVI data at multiple resolutions.

Balancing pasture growth for more grazing value

In nitrogen (N) deficient pasture situations, ryegrass will respond to winter N applications. Summit pasture trials have shown 1kg N/ha in responsive situations can conservatively grow an additional 15kg/ha dry matter during winter.

In such a situation, 30kg N/ha would produce an additional 450kg/ha of dry matter. The size of the response though, will depend largely on soil moisture, density and composition of pasture species, availability (or unavailability) of other nutrients and soil temperature.

What you need to do

- Calculate the cost. For example, if you invested $35 to $40/ha to apply 30kgN (including freight/application) your pasture would produce 450kg extra dry matter (assuming 15kg DM/kg N). Compare that to buying in 450kg of hay.
- Choose quality grassy pastures. Avoid brome and silver grass as they are less responsive than ryegrass or self sown cereals and offer lower nutritional value to livestock.
- Apply a high enough rate to get a decent response. Smaller areas at high rates are better than large areas at low rates.
- Make sure you have enough livestock to utilise the extra feed and graze heavily.

Do your pastures need an early boost? Urea remains the cheapest N source for increased grass growth and pasture remains the cheapest way to feed livestock at this time of year.

Balancing the clover content

Many growers like to see clover in pastures and believe 30 to 40% legume content provides a more healthy and balanced diet than a straight grass pasture.

Regular N applications, or N released by soil mineralisation favour grass and broadleaf weeds at the expense of legumes and their content is reduced by these faster growing competitors.

Another factor to consider is that having legumes in mixtures with grass lowers the amount of N fertilizer required for the pasture. Growers need to adjust their rates for this and make sure phosphorus, potassium and sulphur availability is good.

Analysis

When considering the nutritional needs of pastures, it's difficult to generalise without knowing the location, soil type, grower objectives and any occurrence of specific nutrient deficiencies. Soils are inherently variable due to both geological processes and historic fertilizer applications.

For these reasons, inSITE plant analysis is essential to determine which nutrients are needed and in what amounts for optimal production.

Summit has an extensive range of pasture fertilizers that can be viewed on the Summit website, or growers can contact their Area Manager for more information.

Improving pasture production after dry starts

Over the past few years many growers have faced dry or patchy late breaks, with limited soil moisture and cool soil temperatures going into winter.

Early pasture growth has consequentially been slow, which in turn has impacted on winter animal production. Essentially, what has been experienced is poor soil mineralisation in autumn.

Mineralisation is the conversion (primarily by microbes) of nutrients like nitrogen (N) and sulphur (S) that are temporarily 'locked up' in soil organic matter into plant available forms.

Its significance is that mineralisation can be an important additional supply of nutrients to the ones that are added with fertilizers.

Mineralisation is highly variable. It can slow down to almost a stop with low soil moisture and cold temperatures and speed up quickly as conditions improve.

Better read the situation

Determining background nutrient availability is important for every season and even more so if soil conditions have been dry. Summit Fertilizers can help growers make more informed decisions with state of the art inSITE soil and plant analysis.

Plant testing is a great way of determining whether specific nutrients are limiting plant growth.

All Summit Fertilizers soil and plant samples are analysed by our partner APAL (Australian Precision Ag Laboratory) in their new purpose built facility.

Based on the lab results, inSITE modelling and Area Manager experience, Summit offers practical and impartial fertilizer recommendations to achieve farmer targets.

All results and reports are available to customers through SummitConnect.

TransPlus give Summit's 24/7 despatch the 'thumbs up'

Fast, efficient fertilizer despatch is a hallmark of Summit depot operations. The aim is to ensure nonstop truck movement through the depots with a well-designed layout and loading facilities that are second to none.

For transport companies and farmers alike, we realise things do not always go to plan. Every day, someone out there can face an issue with a truck, loader or driver that can put them behind schedule.

One of the ways Summit has tackled the issue of moving big volumes of fertilizer is by building more flexibility into its procedures and opening depots 24 hours a day, seven days a week during times of peak demand.

The move towards greater despatch flexibility has been welcomed by Derek Mason of TransPlus.

Derek started as an employee of TransPlus before taking over the business in 2003. The Merredin based freight company has a focus on agriculture, carting livestock, fertilizer, grain, gypsum and lime. Derek now has 17 prime movers on the go and for his business, the closest Summit Fertilizers depot is Kwinana.

“Time is money for us and what we want is trouble-free, efficient fertilizer collection for our customers,” he said.

“I did my first load out of Summit back in 1993 and have been picking up from the Kwinana depot ever since.

“It’s a good operation, in particular when the season gets busy. Being open 24 hours a day, seven days a week means we can clear any backlog quickly.

“Some of our drivers prefer to load at night. They’ll slip down to Kwinana when there’s less traffic on the roads, load up at the depot at night and come home and have a sleep. Then, they go out the next day and unload. They can save themselves an hour and a half easily by not being in heavy traffic, and in that scenario there is a lot less stress for the driver if that’s the way they prefer to do it.

“With Summit being open 24 hours a day, that’s what we do because the truck can only do one load a day to Perth and stay within the drivers hourly limitations.

“Many of our drivers prefer us to put the bookings back to night time so they can do it all with a lot less stress.

“With other fertilizer companies, if we’re running a bit late and they are closed by the time we get there, we’re parked up until the next day. Then we won’t have a booking for the next day and they may be booked out the next morning. It causes problems.

"Whereas with Summit, we might have a 10pm booking and if we’re running late, we’ll still get in eventually. It might be 1am the next morning, but we’ll still get in.

“The other advantage of Summit's 24/7 is that if we’ve got a 10pm booking and somehow turn up at 7pm, the driver can have a sleep in the cab and they’ll ring as soon as a spot’s available. And, we’re doing the load booking with someone in Kwinana who can look out the window and gauge what’s going on, not someone in Melbourne that’s simply running off what the computer is telling them what is happening. It’s just more logical, flexible and the depot staff are easy to deal with," Derek says.

Summit Fertilizers' approach to depot management is logical, flexible and the depot staff are easy to deal with, according to Derek Mason of TransPlus. Down time is money lost for cartage companies, and Derek says Summits' extended opening hours during peak periods has been an absolute winner, enabling them more trouble-free, efficient fertilizer collection.

Superior handling MAPSZC

With even sized granules and good levels of copper (0.2%), zinc (0.4%) and manganese (0.1%) compounded into every granule, MAPSZC handles conditions other fertilizers can’t.

The combining of S, Cu, Zn and Mn during manufacture gives far superior distribution in the soil compared to other formulations and is the most agronomically effective method of providing trace elements via solid fertilizers.

MAPSZC is suited to all crops, in particular wheat, barley and canola. It contains nitrogen (11.6%), very high phosphorus (19.8%) and sulphur (8.0%).

High P levels mean seeding rates can be kept to easily manageable quantities, whilst the nitrogen level ensures crop safety.

MAPSZC also stores very well, so it's suited to early collection to take full advantage of Summit’s early collection discounts.

Liebig's Law: Still a good model for thinking about crop production

Liebig's Law, popularly known as 'The Law of Limiting Factors', states that a plant's performance is affected not by the most abundant resource, but by the most deficient one. 150 years on and the wisdom of Justus von Liebig, a German Scientist who spent the early part of his career pioneering organic chemistry, is just as relevant today as it was back then.

Like-minded in thinking, removing the barriers to production is a keen pursuit for Warakirri Cropping Farm Manager, Tony Murfit. Managing 'Mawarra', Tony is one of the many farmers across the State that are co-operating with Summit to explore the potential with its field trial program.

It's truly been a win/win situation and in the past few years trials at Mawarra have delivered some outstanding results that just a few years ago would have been unthinkable.

Mawarra is situated in the eastern wheatbelt, southeast of Merredin and approximately 300 kilometres east of Perth. The farm covers a total area of close to 20,000 hectares. Average annual rainfall is around 315mm, with about 70% typically falling in the growing season between April and October. The cropping focus is all about wheat, barley and canola.

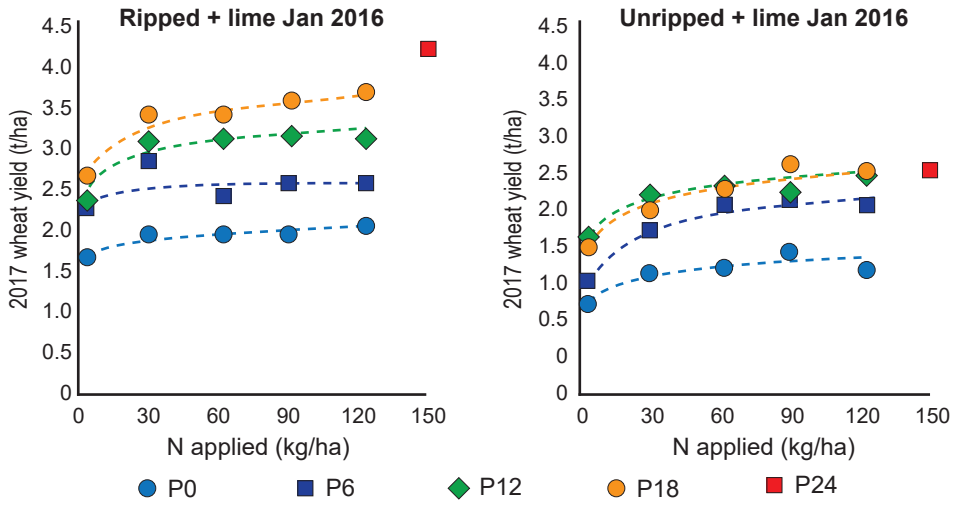
Tony explains, "On about 50% of the farm we were dealing with acid gravel/sandplain soils that have a lot of yield constraints. And we were thinking, what do we need to do to fix those up to maximise our investment?

"So, we started to look at what we could do. The biggest constraints early on were weeds - that come with poor soil, compacted soil, low pH, aluminium, and a little bit of a non-wetting issue.

"We thought we'd tackle those constraints in the fallow and follow with canola because grasses were the main weed issue. To grow canola, you need moisture, so canola was an ideal crop to follow a weed free fallow.

"The aim was to tackle all the constraints in one go and then capture the returns as quickly as we could.

Research assessing the impact of different nutrition regimes on soils following amelioration has been hard to find. So it's pleasing to see that Summit nutrition trials are assisting farms like Warakirri Cropping and yielding some impressive results. Summit Area Manager, Kobus Marais (left) and Warakirri Cropping Farm Manager Tony Murfit (right).



Canola is a high value crop and highly responsive to improved pH and removal of soil compaction.

"We started with lime and deep ripped strips in small trial plots and saw massive increases in canola yield (0.4 to 0.5 t/ha increase) in the first year with just 150mm of growing season rainfall.

"From that trial in 2014 we went on to do a bulk soil amelioration program in 2015 and in 2016 we grew 1200ha of canola on ameliorated soil. Amelioration is like 'open heart surgery' with lime and gypsum ploughed in as deep as possible with a modified disc, then we come through and deep rip down to 400 to 600mm.

"Now we're doing 4,000 to 5,000ha of soil amelioration a year.

"At that stage we started to think, have we left potential yield in the paddock and under catered with nutrition. That's when we approached Kobus Marais from Summit, to see what more we could get out of it.

"In 2017, a Summit trial (Figure XXX above) went into wheat following canola that had been grown on ameliorated soil. Yield in the NxP trial just kept increasing with increasing P.

"We thought wheat yield would hit a plateau and give us the best economic return, but it just kept rising. Even with 24 units of P, it was still climbing. Wheat yield in the trial more than doubled our farming practice rate for the rest of the paddock, which yielded 2.2t/ha.

"Summit trials have been a real eye opener and it's good to see local research still being done in this area."

Shed loads of gains from on-farm storage

The importance of on-farm storage capacity in recent years has been highlighted in the news; mainly for grain, fuel, water and liquid fertilizer. Throughout the State, growers are now turning their focus to on-farm granular fertilizer storage to increase seeding efficiency, spreading logistics and to potentially capitalise on favourable market prices and availability earlier in the season.

As an insight into a grower's perspective of the gains, Bill and Jill Bailey run an 11,000ha operation at Needilup in the Great Southern. Half the farm is dedicated to cropping.

With moisture becoming an issue in the old shed and an increasing cropping program, they decided to upgrade their fertilizer storage facility. This has enabled them to capitalize on favourable market conditions and maintain product quality while their granular fertilizer is stored on-farm.

They decided on an east facing open ended 500 tonne capacity shed; 9m high x 12m wide x 24m deep, with 2.4m reinforced concrete tilt-walls. The pad was raised to 1.2m above ground level to reduce any potential moisture issues.

Bill installed an 8m apron with an offset loading ramp, including a 150mm raised guard for OH&S compliance. This made for clean, smooth and safe operation when moving fertilizer.

His concept was to build a multipurpose shed, to store machinery or grain during the off-season. Bill is anticipating a 10 year return on investment, although he knows it will be hard to quantify exactly the financial benefits of:

- having better handling fertilizer that reduces blockages and downtime at seeding, as well as;
- the convenience of having the bulk of his cropping fertilizer on hand to take advantage of early sowing opportunities.

As with all on-farm investments, proper planning is important and unlike the purchase of other capital items, fertilizer sheds are not easily upgraded without significant cost to the grower.

When contemplating installing a new fertilizer storage shed, growers should focus on the workmanship of the build to maintain the quality of the fertilizer and reduce any potential degradation.

Written by Summit Kojonup Area Manager, Chloe Turner. Moisture getting into fertilizer (above) and Bill Bailey's magnificent new fertilizer storage shed below and below left.

WA suppliers have seen increased demand for multipurpose sheds in recent years. There has been a trend away from the traditional rolling roof to a taller roof design with greater concrete wall height, for increased capacity and ease of operations.

Many are adding sliding doors to the front to aid in moisture control and wind direction should be taken into account with this part of the design.

Try to stay away from rocky outcrops to get better footing establishment. Also consider having the shed wider - not longer - if you need to increase capacity.

This will aid in general operation efficiency.

Installing concrete tilt panels instead of L-blocks will give a clean square edge with the concrete slab floor, making operations more efficient as well as managing hygiene effectively.

There are many factors that go into the cost of a building a shed. As a general guide, approximately half the cost will go towards the shed being manufactured and erected, the other half being the concrete pad and tilt walls, depending on the distance to the nearest concrete batch plant.

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