Winter 2019

Fertilizer News

Summit field trials cover the length and breadth of the state

The 2019 SummitQ Field Research program is now well underway. Our program extends across the length and breadth of the state's agricultural regions, with 35 plot trials now in the ground.

Summit has become a major contributor to crop nutrition research in Western Australia. In 2018 we established 28 trials across WA. This followed on from 32 trials in 2017 and 38 trials in 2016.

As with recent seasons much of the program was dry sown, which is representative of modern farm practice with the trend to sow crops progressively earlier. This can mean taking on a little more risk, but with better potential gains in productivity.

For our field trial management team this poses some real challenges.

Trials emerging around the same time, growing at about the same rate requires more concentrated post-emergent management and simultaneous upkeep. Many thousands of kilometres will have to be travelled to make this program work.

The team is grateful to work with our cooperative host farmers, who make the process easier and assist with trials in many ways. Together we can share maximum benefit from the generated data.

The direction of Summit trial work is largely driven by grower needs and questions. A good example is the establishment of trials to investigate manganese deficiency in lupins. These trials were set up due to concerns from growers who have noticed increased levels of split seed in Jurien lupins, relative to older varieties.

2019 is shaping as a busy year with much useful information to flow from Summit trials.

Our recent crop nutrient trials on ameliorated soils have challenged traditional crop establishment practices. We have extended the number of trials and the geographic spread of these trials in 2019. The aim is to improve our understanding of crop requirements and capabilities in these altered soil profiles. It should also give growers in different regions valuable information on the role nutrition can play in improving returns on what can be high-cost operations to address soil constraints.

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Inside this issue!

For more information talk to your local Summit Area Manager

SUMMIT FERTILIZERS

SUMMIT FIELD RESEARCH

Summit field trials cover the length and breadth of the state (cont.)

Work continues on better ways to determine soil nutrient status and crop response, so future crop requirement predictions will be more accurate. This includes new soil test methods for phosphorus and potassium, along with different approaches to products, rates, timings and application methods.

Summit has been working alongside students from the WA College of Agriculture - Morawa, to research nitrogen supply recommendations for yield and protein in cereal grain varieties. The students helped establish a field trial on College land and will be involved in all aspects of monitoring and data collection.

Collaborative crop nutrition work will continue with private agronomy research partners, the DPIRD, university researchers and the CISRO, plus pasture nutrient collaborative trials with DPIRD and the Department of Water and Environmental Regulation in the south-west catchments.

Our association with grower groups grows stronger each year and spring field day sites will incorporate Summit trials. Growers and advisors should contact their local Area Manager to discuss the Field Research program and to visit the trials in their area throughout the season.

Over the past four years, Summit Fertilizers has conducted more than 130 trials across the state, making Summit one of the biggest investors in WA crop nutrition research. Saritha Marais is the newest member to join the Field Research team - pictured above hard at work. 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.

Plant analysis

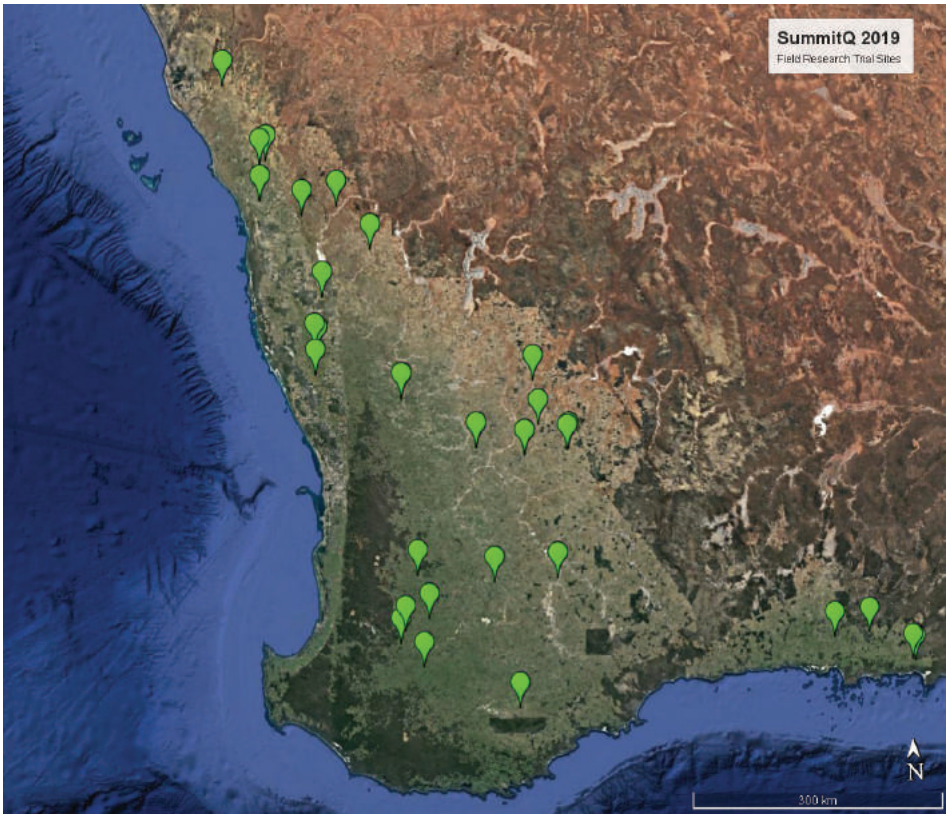
Carrying out plant tissue testing is a great way to determine whether specific nutrients are limiting crop growth.

It is a much more reliable technique compared to soil testing for assessing trace element deficiencies such as copper, zinc, manganese, iron, boron and molybdenum and lesser macro nutrients of sulphur, calcium and magnesium.

Key benefits of Summit Fertilizers plant analysis are:

- Independent laboratory
- Rapid turnaround times
- Wide range of nutrients measured

For more information on Summit plant analysis, or to discuss fertilizer needs, growers should talk with their local Summit Area Manager.



Thirty five Summit trials are now in the ground across the state.

Fuel Gauges...an agronomist's take

Article by Scott Thomson
Central Ag, Goomalling
Agronomist/Proprietor

Josie and I became full owners of Central Ag in July 2016, taking over the original Agserve Goomalling business from Greg Baird. The Goomalling store has been a long-standing Summit Fertilizers agent.

It's been a good working relationship and being an Agronomist, allows me to get into the field with quality fertilizer products and more recently with Fuel Gauges.

For the Goomalling area, the most yield limiting nutrients are phosphorus (P), nitrogen (N) and potassium (K). They are the main drivers of production and in the last few years we've realised that the K and P rates for this area are probably not high enough.

Our clients have had some really high production years in the last five, achieving above average yields. Typical longer-term yields for this area for wheat would be 2.5 to 3t/ha, 3 to 3.5t/ha for barley and 1.2 to 1.5t/ha for canola. But, in more recent years growers have been pushing 1.8 to 2t/ha plus for canola, wheat yields going between 3.5 to 4.5t/ha and barley going between 4 and 5 t/ha, on the better producing country.

Fuel gauges

Last year I put down at least 50 Fuel Gauge strips and about 25 the year before. I aim to put down one or two on each of our customers properties. Originally I started in wheat and barley, but in the last couple of years they have also gone down in canola just to see any early response, as canola is very responsive to nitrogen.

Last year with the late break and then having a dry September, early nitrogen availability on canola was important. It showed up in the Fuel Gauges and translated to yield at the end of the year.

Fuel Gauges have identified a range of issues that we can overcome. Within some crops on some soil types, we are not getting a very big response to nitrogen and it's sometimes because of other nutrients such as K or P deficiency.

Ongoing research is further validating the SummitQ Fuel Gauge system as a rapid, adaptable and robust tool for producing reliable in-season fertilizer recommendations. Summit Area Manager Brayden Noble and Scott Thomson from Central Ag test Fuel Gauge application equipment prior to the season commencing (above). Scott Thomson and Lyndon Bird discussing which Fuel Gauges would be appropriate for Haywood Bird Farms this season (below).

We've been able to identify that through follow-up tissue testing of Fuel Gauge sites and then made the changes over the summer to fix that particular issue for the following year.

A lot of my Fuel Gauges now go onto canola stubble because they can extract a lot of nutrition from the ground. Ideally, they go down at seeding time and we continue to monitor through the season to see what response we are getting.

Every year is completely different and coming off a dry summer, we tend to see an earlier response to nitrogen because the stubble hasn't broken down and mineralised N.

We GPS all our sites and I give that information to Brayden Noble, our Summit Area Manager. He does the NDVI measurements. Summit do the calculations and the reporting that follows is very accurate. The replicated trial work Summit has done to verify the recommendations gives me a lot of confidence.

A few years ago, cereals would have been sown with 8 units of K and 10 to 12 units of P. Now it's more likely to be 12 units of K and 12 units of P. Then, we'll identify parts of the paddock with yield mapping and intensive soil testing.

If it indicates it will respond to K we'll spread muriate of potash in March, or early April. Some selected areas can get a total of up to 50 units of K and the yield curve is still going up, so we really don't know where the K values may end up.

Summit Superphosphate

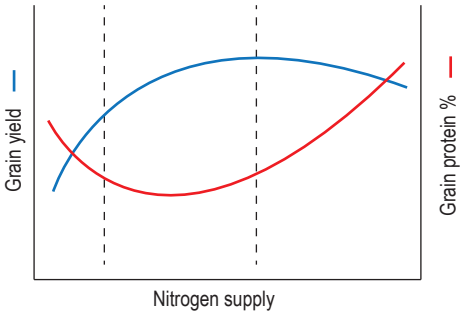
The key drivers of grain protein

Grain protein is one of the key parameters of grain quality as it determines whether the grain is appropriate for different end uses.

Last season grain protein in deliveries was lower than normal across WA grain growing areas. In the Kwinana zone up to 75% of deliveries were below 10% protein, 50% were ASW and 25% were noodles.

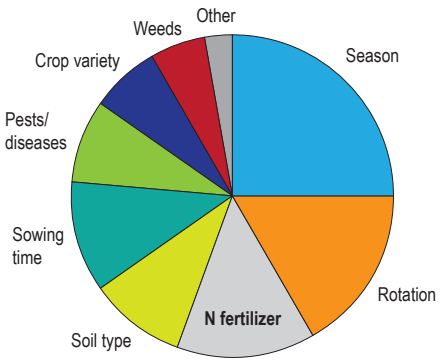
It is important to understand the relationship between nitrogen supply, yield and protein during grain fill. Generally, with low nitrogen (N) supply there is a large yield response to any applied N. As N supply increases there will be a continued yield response and some response in protein. It is not until yield response to N is maximized that grain protein noticeably increases (Figure 1).

Figure 1. The generalised relationship between nitrogen supply, grain yield and gain protein



Key factors influencing grain protein are seasonal conditions, rotations, nitrogen fertilizer and soil type. Other factors such as sowing time, pests and diseases, variety and weeds can all affect grain protein as they impact on grain yield. As can be seen in Figure 2, season is the key driver of protein and seasonal conditions are very hard to predict when nitrogen decisions are being made.

Figure 2. Factors impacting on grain protein



Potential yield is determined by growing season rainfall and distribution, this in turn influences the relative supply of N in relation to grain.

Good rainfall and a cool finish dilutes protein as it is laid down early during grain fill, compared to the starch component being laid down later. A hot dry finish limits starch accumulation and the result is smaller grain and higher protein.

Summer or autumn rain and spring rains will impact the amount of mineralization of soil organic matter.

Wet warm soil promotes microbial activity and the microbes breakdown soil organic matter and release N. There is limited microbial activity under cool winter conditions. Therefore after a dry summer there will be less nitrogen available from soil reserves.

In-season crop demand for N also needs to be understood. Plants require nitrogen for protein synthesis and growth. The amount of N required is proportional to the biomass or crop grown, the type of growth stage and target protein. N at sowing sets up early growth and yield potential. N during tillering ensures adequate tillers develop to set yield potential. Twenty to 30% of total nitrogen is taken up by stem elongation.

The biggest demand for N is during stem elongation as it is needed to support rapid growth and build plant reserves for grain protein. Eighty to 90% of total N has already accumulated in plants by flowering. The N is then re mobilised from leaves to grain for protein.

Rotations determine the level of organic matter in the soil that is available for mineralization. Legume crops or pastures will add organic N to the soil which can then be utilised by following cereal or canola crops.

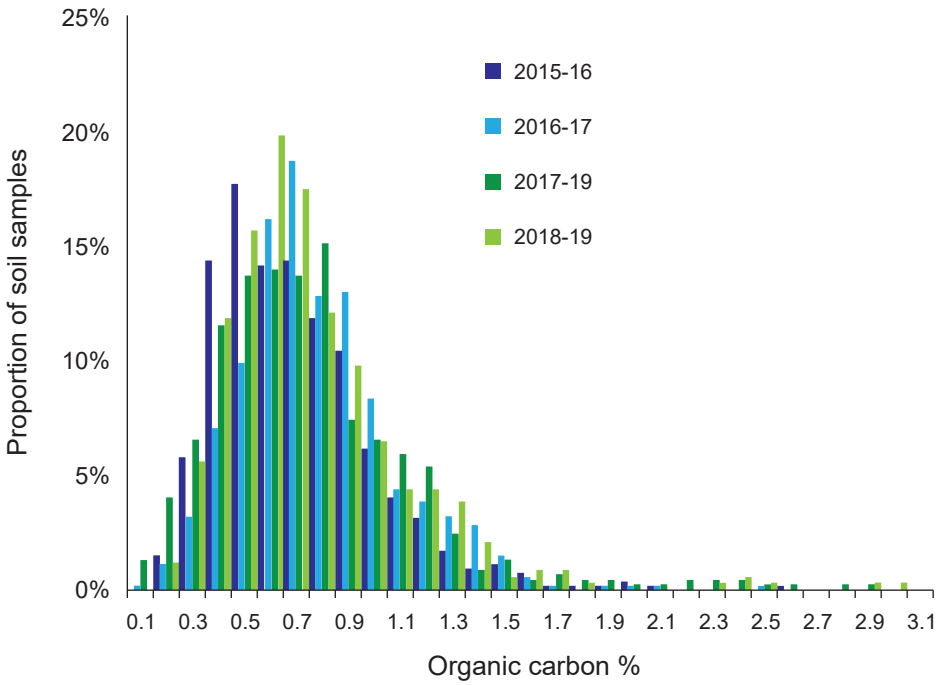
Unfortunately, the amount of lupin crops and legume pastures in our farming system has declined in recent years and been replaced in the rotation by cereals and canola. This has led to a decline in soil organic carbon levels seen in soil test results. With this decline, less organic N is supplied. Historically, under the pasture ley system soil nitrogen levels accumulated in the pasture phase and declined under the wheat phase.

As an example in the Midlands area, 87% of soil samples taken in the last 4 years have a soil organic carbon level below 1% and 30% are less than 0.5 percent (Figure 4).

At this level there will be minimal mineralization regardless of the season.

Soil type has an influence on grain

Figure 3. Soil organic carbon levels in the Midlands



In-season crop nutrition tips

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protein through nitrogen dynamics and soil moisture supply. Heavier soils tend to have greater organic matter, better water holding capacity and are not as subject to leaching, which leads to a higher capacity to store N.

Lighter textured soils tend to have lower organic matter, poorer water holding capacity and are subject to leaching, which leads to a lower capacity to store N. These soils also tend to have a greater risk of sub-soil constraints like hard pans or acidity, that prevents roots gaining access to deeper moisture and nitrogen.

If considering N management for this season, growers will need to understand the potential soil supply. Rotation history, soil type, soil organic carbon levels and summer rainfall are all key drivers.

From that information, an N application strategy can be developed, remembering the relationship between yield and protein, and that the spring conditions will impact on the final result.

Figure 4. Midland soil samples (2015/16 - 2018/19)

Organic carbon %	Average
< 0.5	31%
< 0.8	71%
< 1.0	87%
Sample size	1841

For any in-season nitrogen (N) application to be fully effective, many other nutrients including phosphorus (P), potassium (K) and sulphur (S) need to be adequately available.

A nutrient imbalance or deficiency can result in under utilised N, which can end up as a direct financial cost to the grower as well as having potentially undesired environmental effects.

Because there is no real chance of recovering a deficient P situation during the season, the P seeding rate needs to be sufficient for seasonal yield potential.

K and S applications tend to be more flexible. Growers have a chance to influence N use efficiency during the season with additions of these nutrients, depending on identified requirements.

Potassium

K is a critical nutrient for many things including maintaining cell structure. As plant growth is stimulated with added N, cell division is rapid. The tillering/elongation stages of plant growth is when the rate of cell division is highest, therefore, there is a need to ensure adequate K prior to and during this stage.

Cereal crops remove about 4kg of K per tonne of grain. Cereal stubble that remains after harvest contains about 12kg K/t. Canola and legume crops are close to double this.

The concentration and impact of K held in stubble is obvious when growers consider what happens at harvest with stubble spreading or windrowing, and then what happens afterwards with rain or burning. These events may leave parts of the paddock K deficient, irrespective of what soil tests indicate.

Hence, K responses can be quite variable and sometimes 'out of step' with soil test results. The key message is to maintain adequate applications and reserves over the long term.

On K deficient soils, it's been common practice to apply 8 to 15kg K/ha at seeding. However, in many cases such as good seasons, this may not be sufficient to cover the required needs of the crop.

Article by Brett Beard
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Sulphur

The balance between N and S has consistently shown itself to be important for both yield and grain or oilseed quality.

Trials have shown the S rate in oil crops should be at least the same as the P rate. Given S is a leachable nutrient, combining seeding and a follow-up application is sound agronomic practice.

The optimum fertilizer ratio for N:S in cereals has been shown to be 7:1, and 3:1 in canola. The N:S ratio in plant tests results is different, which is what a lot of the NS products mimic.

NS granular products have agronomic advantages whereby a portion of N is in a form that is non-volatile and non-leachable on application.

Summit Area Managers use Fuel Gauges along with other diagnostic methods to identify nutrient deficiencies. And even though N visual responses can be dramatic, don't underestimate the importance of other nutrients when there are no visual symptoms. High yielding scenarios (2.5t/ha plus for cereals) should be factoring in top-up K and S applications to maximise production, quality and maintain soil fertility. Growers can contact their local Summit Area Manager for further assistance.

DAPSZC®

A cheap boost for winter feed

Pastures are the cheapest feed source and applying nitrogen (N) fertilizer to grassy pastures can dramatically boost winter pasture growth and quality. N increases metabolizable energy and crude protein content in pasture and also decreases the pasture neutral detergent fibre (NDF) content.

The first thing to remember with a winter pasture boost with N is that urea is the cheapest source of nitrogen. At today's values, 1 kg of N in urea would cost about $1.18, whilst the same kg of N in UAN form would cost about $1.47 (That's a 24% premium).

Results from Summit pasture trials reveal 1kg N/ha in responsive situations can conservatively grow an additional 15kg dry matter/ha during winter.

- In such a situation, 30kg N/ha would produce an additional 450kg dry matter/ha.
- 65kg of urea or 75L UAN supplies 30kg N and costs about $35.40 and $44.10 respectively.
- Hence, the cost of an extra tonne of paddock grown feed in this conservative scenario would be about $79/t for urea, and $98/t for UAN.

The size of the response will depend largely on soil moisture, density and composition of pasture species, availability (or unavailability) of other nutrients and soil temperature.

What do you need to do?

- Choose grassy pastures. Avoid brome and silver grass areas, they are less responsive than ryegrass, barley grass or self sown cereals.
- Apply a rate high enough to get a decent response (>65kg/ha urea).
- Consider applying N in smaller areas around the farm. Smaller areas at high rates is better than large areas at low rates.
- Make sure you have enough stock to utilise the extra feed and graze heavily.

MAXamFlo an ideal N:S balance

Much of the liquid fertilizer market in WA is UAN, however MAXamFlo from Summit Fertilizers, offers a great alternative, especially for nitrogen application on canola paddocks.

Summit MAXamFlo contains 6.2% w/w sulphur (S) along with 22% w/w nitrogen (N), which makes it an excellent choice for those situations where S and N are both required.

Canola has a higher demand for S than cereal crops. If the N:S ratio rises above 13 to 1, then S deficiency can occur. Cereal crops typically run into S deficiency if the N:S ratio exceeds 18:1.

MAXamFlo can replace UAN to supply N and S in pre or post-emergent applications, or can be used as a liquid alternative to UreaPlus or sulphate of ammonia.

MAXamFlo is exceptionally well priced and has traditionally provided N at a lower cost per unit than UAN or other liquid nitrogen fertilizers. This has also meant the S component has been provided for no additional cost when MAXamFlo has been used.

Many growers add sulphate of ammonia or other water conditioners to the spray tank when applying glyphosate (and other herbicides) to limit the impact of poor water quality or to limit antagonism between herbicides in a tank mix.

Applying herbicides in MAXamFlo or adding low rates to the spray tank along with the water will overcome this requirement and the hassle of disposal of all those bags. This would also apply for growers of Roundup Ready canola where MAXamFlo and Roundup Ready Herbicide can be applied post-emergent.

Come and visit us at the field days!

Summit Fertilizers' long history of supporting the regional field days is a direct reflection of our commitment to the rural community.

Regardless of the season, we'll be with you all the way.

This year will be no different and growers will be able to meet with Summit staff from all departments and receive information on all the latest from Summit, including our 2019/20 market offer.

This year's field days

- Mingenew: August 14 and 15.
- Dowerin: August 28 and 29.
- Newdegate: September 4 and 5.

Summit and APAL a proud partnership

Article by Ryan Walker
APAL Managing Director

Australian Precision Ag Laboratory Senior Chemist,Tim Thompson (left), and General Manager Darryl Hartley (third left) show Eddy Pol and Dr Mark Gherardi the new state-of-the-art APAL facilities.

Australian Precision Ag Laboratory (APAL) is proud to support Summit with state-of-the-art soil and plant analysis, providing accurate data on soil and plant health. The collaboration has extended to joint trial locations aiming to improve advice and recommendations to WA growers. APAL is impressed with Summit's approach to delivering and continually exploring solutions for WA soils.

APAL has recently invested in a new purpose built facility. Designed with process improvement in mind, we looked at sample flow, eliminating excessive sample movement, reducing human error with automation and ensuring adequate space is available to perform testing. And there's plenty of room to grow the facility with new technologies in an ongoing effort to continually improve our services.

The investment in R&D in areas such as Mid Infrared (MIR) will see benefits to Summit clients with rapid analysis of some tests including particle size analysis (texture classification).

The Farm2Lab APP provides an easy to use portable sample logging and submission tool that integrates directly with APAL enabling a streamlined sample booking in process. An online portal also provides a way for Summit to track sample progression in the laboratory in real time.

Our partnership benefits Summit clients by providing accurate independent testing backed with a wealth of agronomic knowledge.

New Summit appointments

Chloe Turner
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Chloe Turner joined the Summit Fertilizers team as the Area Manager for Kojonup in May 2019.

She has previous experience managing multiple research projects and extension for the Facey Group, which provides her with an excellent understanding of issues faced by growers in her area.

Chloe has a Bachelor of Agribusiness from Muresk and grew up on the family farm in Wickepin. She is keen to assist growers in increasing production and profitability through soil and plant testing and Fuel Gauges.

While she is not working, Chloe's interests include gardening, motorsports, music, house renovating and spending time with her dogs.

Brenna Gray
Summit Area Manager, Wongan Hills
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Brenna Gray has been appointed to the role of Area Manager for the shires of Wongan Hills, Dalwallinu and Koorda. Brenna joined us in April 2019, taking over from David Armstrong who has moved to the head office in Kwinana.

She holds a Bachelor of Agribusiness (Farm Management) from Curtin University and is well equipped to provide fertilizer and crop nutrition advice to growers in her area. She previously worked for CBH as the WA product support coordinator for the Infratec™ Sofia grain analyser.

Outside of work, Brenna enjoys horse riding, especially dressage and is looking forward to competing in local events.

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