Autumn 2022

Fertilizer News

Striking the right balance and management decisions with your 2022 fertilizer plan

There are many considerations to take into account when making fertilizer decisions for 2022 and they will vary depending on your individual circumstances. The biggest talking point for this season has been the rapid increase in fertilizer prices from a relatively low base in 2021. However, other factors like a record harvest for many, frost for others, and even fires destroying pastures and crop residue and leaving paddocks open to wind erosion also need to be considered.

The potential return from fertilizer at current grain prices was covered in our spring newsletter and demonstrated that well balanced nutrition will remain the best scenario for this season.

Reducing fertilizer inputs because of higher costs will potentially lead to lower yields and a lower return.

For growers fortunate enough to produce high yielding crops last year after an excellent growing season, the focus is to determine a nutrient balance based on fertilizer input and nutrient removal. I believe most paddocks will show a negative balance which means that the soil reserves will be lower going into this season. Table 1 gives a guide to nutrients removed by each tonne of seed or grain.

By Eddy Pol
Executive Manager – Marketing & Sales

Table 1. Crop nutrient removal

	N	P	K	S	Ca	Mg	Cu	Zn	Mn
	kg/t						g/t		
Wheat	23	3.00	4.00	1.40	0.33	0.93	5	29	40
Barley	20	2.90	4.40	1.10	0.35	1.08	3	15	11
Oats	16	3.00	4.00	1.50	0.50	1.00	3	17	40
Canola	40	6.50	9.20	9.80	4.10	4.00	4	40	40
Lupins	51	3.80	8.80	3.10	1.70	1.70	5	30	60

In many cases the crop demand for nutrients is higher than given in the table because nutrient use efficiency (NUE) is rarely 100 percent.

Having a negative nutrient balance may not be detrimental in the short term for paddocks that have a good fertilizer history and nutrient levels, although growers would appreciate it is not good practise longer term.

For paddocks with an unknown history or lower fertility it is especially important to soil test to determine the nutrient status before finalising your fertilizer program. Our Area Managers are trained in the best way to take samples and record their location, which helps you build the bigger picture of your farm's soil fertility and any potential production constraints.

Frosted paddocks harvested for grain would have a higher residual nutrient status in the standing stubble

Continued next page

Inside this issue!

- Summit trials investigate P response to sowing time, wheat variety and seasonal conditions
- New P findings for high PBI forest gravels
- Highest canola return comes from up-front N
- Wyalkatchem N x K timing trial update
- Kwinana Depot open 24/7, every day of the year
- Your soil information anywhere anytime
- Now's the time to be planning Fuel Gauges
- Summit welcomes Dennika Reynolds and Sam Marsh
- Easy to use fertilizer calculators

Striking the right balance *(continued)*

than paddocks not impacted by frost. However, the question to be asked is, will those nutrients be available to this seasons crop?

Nitrogen, phosphorus and sulphur are all retained in the stubble until it breaks down and releases these nutrients back into the soil. Potassium is more readily leached out of the straw by rainfall, after which it becomes available to the next crop.

Stubble management will impact on the amount of nutrients available to the coming crop.

Burning the frost affected stubble means losing all the nitrogen and sulphur, while the phosphorus and potassium will remain in the ash, however this will be prone to blowing off the paddock and lost.

Retaining frost affected stubble would add to the nutrient reserves in the paddock for the longer-term. They would need to be incorporated into the soil or mulched to speed up their breakdown to make nutrients available for this year's crop.

In the very unfortunate situation where a bush fire has burnt through a paddock there is potential for nutrient loss. As with burning stubble, the nitrogen and sulphur in the crop residue will be lost as a direct result of the fire.

Phosphorus and potassium will remain in the ash, however leading up to seeding there is a real risk of these nutrients being lost with the paddocks more exposed to wind erosion.

Nutrients in the soil profile are generally not impacted by fire. The exception may be paddocks with higher organic matter in the surface which, if burnt, may reduce the nitrogen soil concentration. This is more likely to be an issue in long-term pasture paddocks.

Whatever your situation, our Area Managers are here to help and can review and assist you with your 2022 fertilizer plan.

Summit trials investigate P response to sowing time and seasonal conditions in wheat

Summit Fertilizers Area Manager Brayden Noble (left) and Northam grower Nathan Lawrence at the 2020 trial site that investigated P response in Scepter and RockStar wheat varieties, to time of sowing. For Nathan, 2020 turned out to be a well below average rainfall season.

The trend towards increased farm size and continuous cropping has resulted in many growers now having to manage large seeding programs. Depending on soil moisture availability, seeding typically takes place anywhere from April to June. That's a three-month sowing window where a range of conditions including soil temperature can change remarkably.

Within that time frame is the mind-set that given sufficient moisture for seed germination and crop emergence, early sown crops have higher yield potential. As a general rule, late sown crops have a lower yield potential.

And yet, despite these perceived yield differences there is little evidence to suggest that WA growers adjust seeding fertilizer rates, in-particular phosphorus (P), in response to the sowing window and changing soil conditions.

There may well be a good reason for that. Local data detailing crop P requirement and response for different sowing times in the WA Wheatbelt has been hard to find.

Indeed, it has not been generated for new, higher yield potential varieties, or, for varieties with different maturation times - which may be important if they are sown early.

If growers had to make an educated guess, a reasonable assumption for P seeding rates would be to follow seasonal trends for other nutrients such as nitrogen.

Following that rationale, high potential early sown crops would require more P. Later sown crops with lower yield potential could have their seeding P rate cut.

Results from two recent Summit field trials however have challenged this theory and revealed a lot more about P requirements in two very contrasting rainfall seasons.

The 2020 trial at Northam was on Nathan Lawrence's farm in a low rainfall year and the 2021 trial was on Rod Dempster's Meckering property in a season with substantially higher than average rainfall.

The findings support similar studies in South Australia that demonstrate when wheat is sown in cooler temperature soils late in the sowing window, it is more difficult for it to acquire P. Hence, reliance on supplementary P becomes greater.

Those findings and more are detailed in the trial results on pages 3, 4 and 5.

Does optimum wheat P requirement change with sowing time and conditions in WA?

Back in the 1980's and 1990's, research in New South Wales found that wheat sown in April into high soil moisture achieved higher yields than later sown crops.

While there's nothing remarkable about that with everything we know today, the work also indicated at equivalent applied phosphorus (P) rates, early sown crops in the trials attained near maximum (90%) yield with less applied P.

More recently similar results have been found with both mid and late season maturing wheat cultivars on high P-fixing calcareous soils in South Australia, in crops sown with adequate April rainfall.

The question to be asked is, does this research have any implications for WA farmers with our very different soil types and climate? The fact is that data detailing crop P response and requirement at different times of sowing in WA, testing the new high yielding varieties, is not readily available. It's an important knowledge gap and prompted Summit to undertake trials that could provide a new foundation for improving cereal crop P fertilizer advice and management.

Two Summit trials have examined wheat response to P at two separate sites in 2020 and 2021. Although the trial sites were only 13km apart, the growing season rainfall was vastly different between years (Figures 1 and 2). And yet, despite large seasonal differences, the crop response to applied P was strikingly similar, as the following results show.

Trial details

Soil analysis at both sites included Colwell P, phosphorus buffering index (PBI) and DGT to assess soil P status (Table 2).

The 2020 trial at Northam and 2021 trial at Meckering included two wheat varieties (early-mid Scepter and mid-late maturing RockStar), five P treatments (0, 5, 10, 20 and 40kg/ha) applied as MAP and three times of sowing (T1 April, T2 May and T3 June -Table 3).

Seasonal conditions

While similar April rainfall was received in both years prior to T1 sowing (Table 3), rainfall for the remainder of the season was vastly different. Soil moisture was sufficient for T1 crop emergence in both years, however in 2020, T1 early crop growth was much slower than 2021 with 25mm rain falling between T1 and T2 in 2020 compared with 69 mm in 2021.

Ultimately, the 2020 season at the Northam site was a Decile 1 rainfall growing season, characterised by a sharp and early finish.

The 2021 season was Decile 10.

Emergence

Despite these rainfall differences, the number of emerged plants was consistent between years, varieties and time of sowing

Plant counts averaged 170 and 165 plants/m^2 for Scepter and 183 and 154 plants/m^2 for RockStar for 2020 and 2021 respectively.

Emergence in all treatments was above the threshold of 100 plants/m^2 that would limit yield.

Rate of P fertilizer did not affect seedling emergence.

continued next page

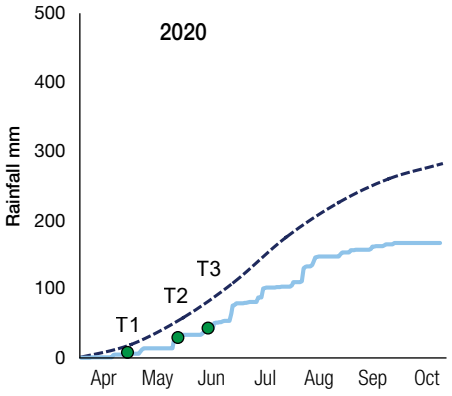


Figure 1. 2020 rainfall from Northam DPIRD Station (13km SW of trial). 30-year average rainfall data is from Northam BOM Station. The 2020 growing season was Decile 1, 131mm below the long-term average. Below average rain fell in all months from March through October.

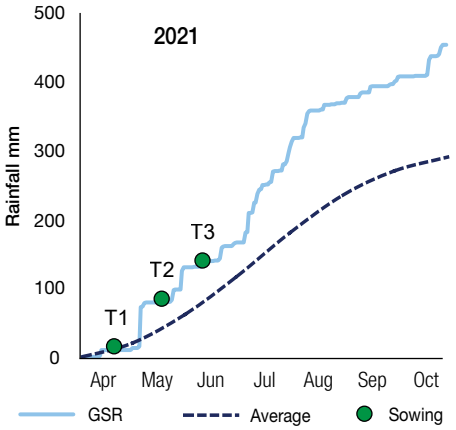


Figure 2. 2021 rainfall data from Northam DPIRD weather station (22km WSW of trial). 30-year average rainfall data is from Grass Valley BOM Station (16km WSW). The 2021 growing season was Decile 10, exceeding the 30-year average by 164 mm.

Table 2. Soil phosphorus analyses at the two sites

Depth (cm)	Northam 2020			Meckering 2021		
	Colwell P (mg/kg)	PBI	DGT (µg/L)	Colwell P mg/kg	PBI	DGT (µg/L)
0-10	19	26	48	37	39	57
10-20	9	27	22	14	46	12
20-30	6	57	5	5	57	7

Table 3. Time of sowing dates and growing season rainfall prior to sowing (1st of April to sowing date) for the two years

Year	T1		T2		T3	
2020	28 April	7 mm	28 May	32 mm	15 June	48 mm
2021	21 April	10 mm	18 May	79 mm	11 June	137 mm

Vegetative growth

In all times of sowing RockStar had greater NDVI compared with Scepter ($p<0.001$), typical of the more vegetative growth habit of this variety.

Overall, biomass increased with increasing P rates ($p<0.02$) and the main effect of sowing time affected how biomass responded to increased P ($p<0.01$). Wheat sown in April and May showed a similar response with moderate increases in biomass up to 10 kg P/ha. Sowing in June showed a stronger biomass response to increasing P rates, with the greatest NDVI measured at 40 kg P/ha in all cases.

Yield data

Site mean treatment yields ranged from 1.2 to 2.0 t/ha in 2020 and 2.3 to 4.4 t/ha in 2021.

In 2020 there were no differences in yield between the varieties. However, in 2021 RockStar yields were higher than Scepter ($P<0.01$).

As a general observation, yields were greatest in April or May sown wheat, with significant yield penalties evident by delaying sowing until mid June.

Relative yield responses to P were greater when the crop was sown later ($P<0.01$) for both varieties and in both years (Figure 4).

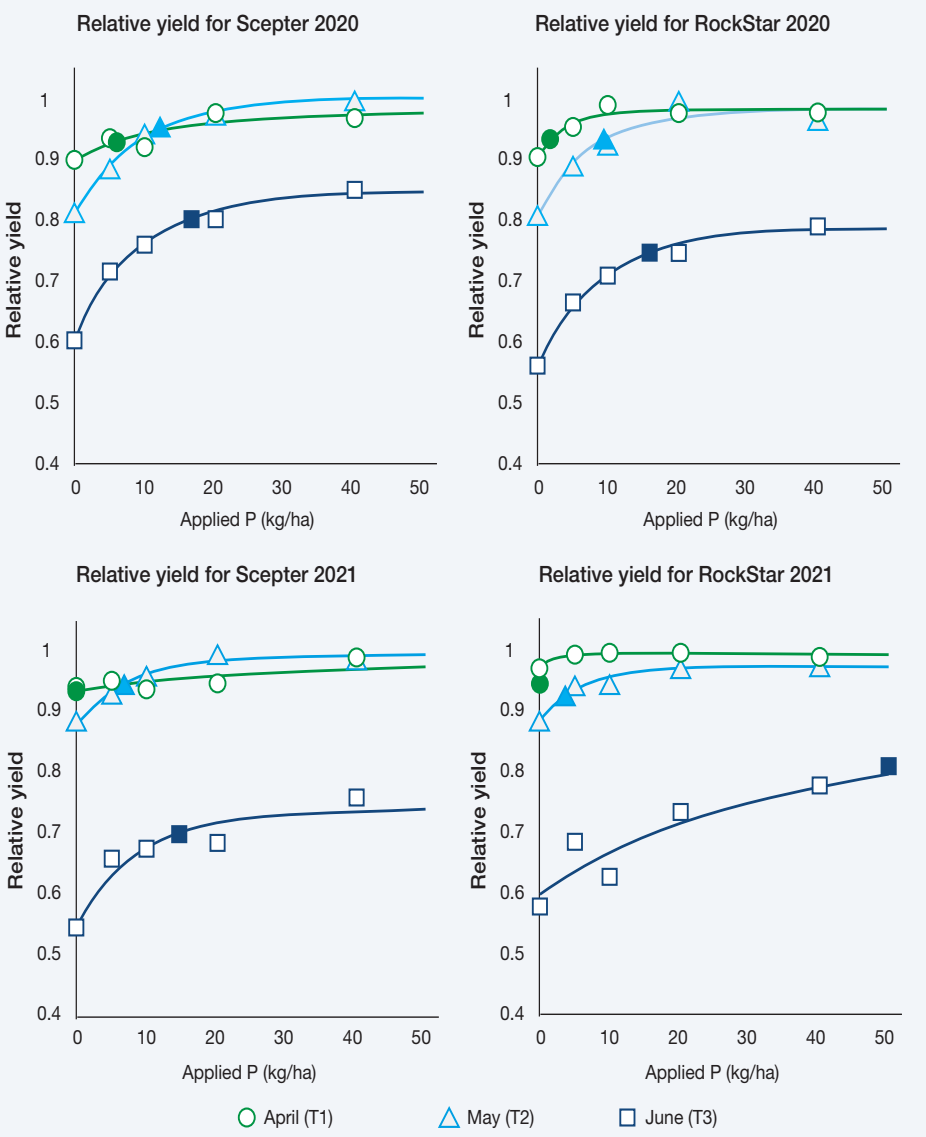


Figure 4. Yield responses to P by wheat varieties sown at different times in two years. Open symbols are yield measurements relative to the whole-trial maximum. Closed symbols are near-maximum (95%) yield for each sowing time, indicating how optimum P requirement changes as wheat is sown later.

The low yields for both varieties sown in June in both trials when P was not applied, indicated a decrease in plant available soil P and/or a decreased capacity of the plants to access or take up and utilise the P from the soil pool.

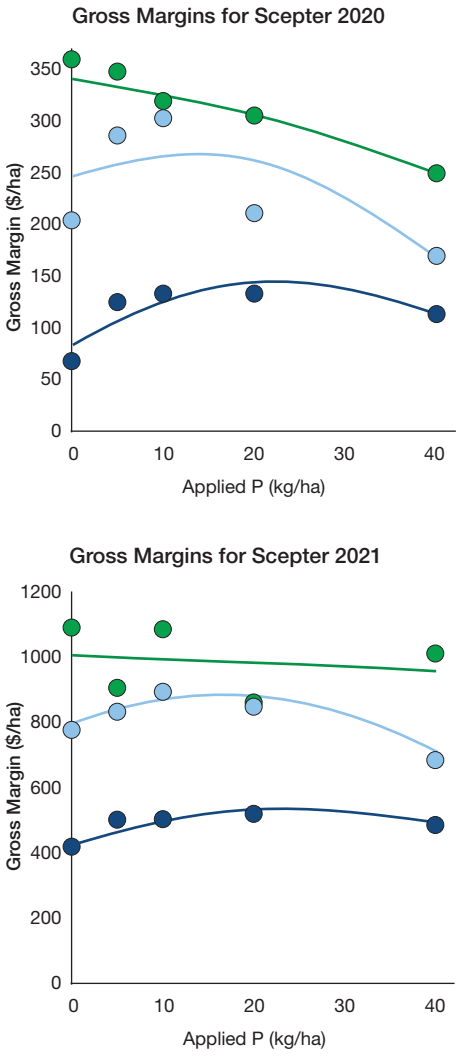
Gross margins

Gross margins for these trials were a simple calculation of grain value for yield and delivery grade, minus cost of all fertilizer inputs for P and basal nutrients (Figure 5).

Early sowing produced higher returns overall.

Achieving optimum returns required increased P application with the later sowing times in high (2021) and low (2020) rainfall seasons.

Figure 5 (below). Gross margins for the three sowing times. Simple 2nd order polynomial regression lines are fitted.

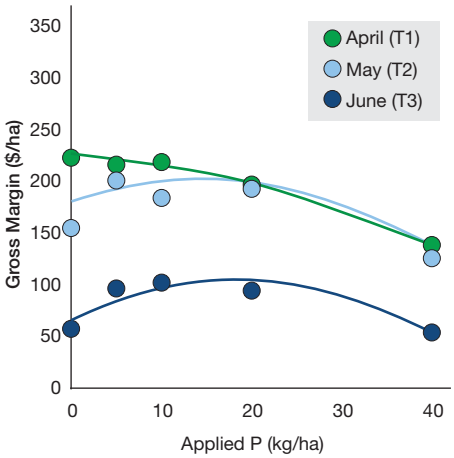


The small yield responses to P and corresponding low optimum P requirements in early-sown wheat is somewhat counter-intuitive to the generally accepted rule of thumb that increased yield potential needs to be supported by higher inputs.

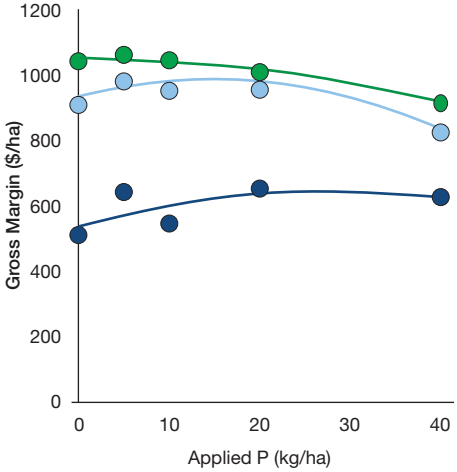
Nonetheless, the data is consistent and has implications for P fertilizer management. It is becoming clear, if soil moisture is sufficient for wheat emergence, that there could be an opportunity for growers to sow wheat early with a decreased rate of fertilizer P and still achieve yield potential.

Conversely, consideration should be given to increasing fertilizer P supply to wheat crops as sowing dates extend into early June and beyond in order to optimise yield and returns from a late-sown crop.

Gross Margins for RockStar 2020



Gross Margins for RockStar 2021



Trial harvesting at Nathan Lawrence's Northam farm after the low rainfall season of 2020.

Key points to-date

- The Summit P rate x time of sowing trials in 2020 and 2021 clearly show the relationship between early sowing and increased crop yield and profit potential.
- The trials shed new light on late P requirements for late sown wheat in WA. These results support findings from South Australian studies that demonstrated when wheat was sown in cooler temperatures late in the sowing window, it can be more difficult for the crop to acquire P from the soil pool. Consequently, the crop can become even more reliant on supplementary fertilizer to meet P requirements.
- When soil moisture was adequate for crop emergence, optimum P applications at sowing varied with sowing time, from lower in April sown crops to higher in June sown crops. This effect was seen in early-mid and mid-late maturing wheats, in a low rainfall year in a marginal P status soil, and in a high rainfall year in a soil type with a more healthy P status.
- Over a 7-week sowing program, optimum P application rate for wheat could vary by as much as 10 to 15 kg/ha.
- The results suggest, in certain specific circumstances, there are opportunities to fine tune on-farm management of P inputs for better efficiency and improved profit outcomes. Global events see farmers approaching a season where fertilizer prices are historically high, and this will intensify even further the need to maximise fertilizer efficiency.

Some food for thought

Opportunity may exist for growers sowing wheat in April and early May, when conditions of good soil moisture occur, to decrease P inputs while still achieving near-maximum growth and yield potential. Shifting those saved P resources to crops sown later in the season may have a proportionately greater impact on increasing yields and contributing to an overall improvement in yield and returns across a cropping program.

This approach would of course rely on informed management and making use of the residual soil P pool, which the trial data also showed can be depleted by higher P export in early-sown crops. Contact your Summit Area Manager to discuss the tools we have available within our inSITE program to make you better prepared to make these decisions.

New P findings for high PBI forest gravels

A phosphorus (P) trial at Bannister in 2021 has yielded some excellent results on forest gravels and highlighted the value of the DGT-P soil test.

DGT-P analysis has recently become available to Summit clients through our inSITE soil analysis program.

SUM21.05 assessed the response of Scepter wheat to P rates up to 50kg/ha on a high PBI forest gravel soil. It also compared the Colwell P test with the more recent DGT-P soil analysis technique (both explained below right next page).

Trial aims were to test:

- P rates that would achieve the highest economic return in this high PBI forest gravel soil; and also,
- the best soil testing procedures for high PBI soils.

Soil was sampled on May 10th down to a final depth of 50cm with analysis done every 10cm.

Colwell P (40 mg/kg), PBI (>200) and DGT-P (11 µg/L) were all measured through Summit's inSITE soil testing program with the results back from the laboratory in seven days (Table 4).

Scepter wheat was sown two days later at 85kg/ha. Seeding P fertilizer was banded below the seed and the site received good background nutrition of nitrogen, potassium, sulphur, copper, zinc and manganese.

In-season observations

As the season progressed the Bannister trial produced large treatment differences with plant biomass clearly responding to increasing P rate (Figure 6).

These differences translated to significant yield improvements come harvest.

Harvest results

The decile 10 growing season rainfall was reflected in high grain yields across the trial, ranging from 2.98t/ha when no P was applied increasing to a high of 5.22t/ha when 50kg P/ha was applied (Figure 7), a 75% increase.

There was a significant trend of yield increasing with P rates all the way up to 50kg P/ha ($p<0.001$).

A yield P response curve demonstrated a strong positive correlation between applied P and harvest yields, and showed yield was most responsive to increases in P up to 20kg/ha, but continued to respond to increasing P rates up to 50kg P/ha.

Colwell P vs DGT-P

Initial soil test results of Cowell P of 39mg/kg indicated some P response would be likely with a high PBI in this soil of 210.

In comparison, a DGT-P of 11µg/L in the topsoil and lower at depth, predicted a much greater P response for wheat, which proved to be a more accurate predictor in the case of this trial.

Gross margins

Despite grain protein decreasing with increasing P rates, the reduction in grain value due to grain quality and the increases in fertilizer costs were more than compensated for by increases in grain value as a result of higher yields (Figure 8a).

Gross margins increased from a low of $983/ha when no P was applied up to a maximum profit of $1560/ha when 50kg P/ha, indicating increasing P rates remained profitable up to the maximum application.

Returns from the application of 50kg P/ha exceeded those from applying no P by 59% (Figure 8b). Note, gross margins are based on 2021 season grain and fertilizer values.

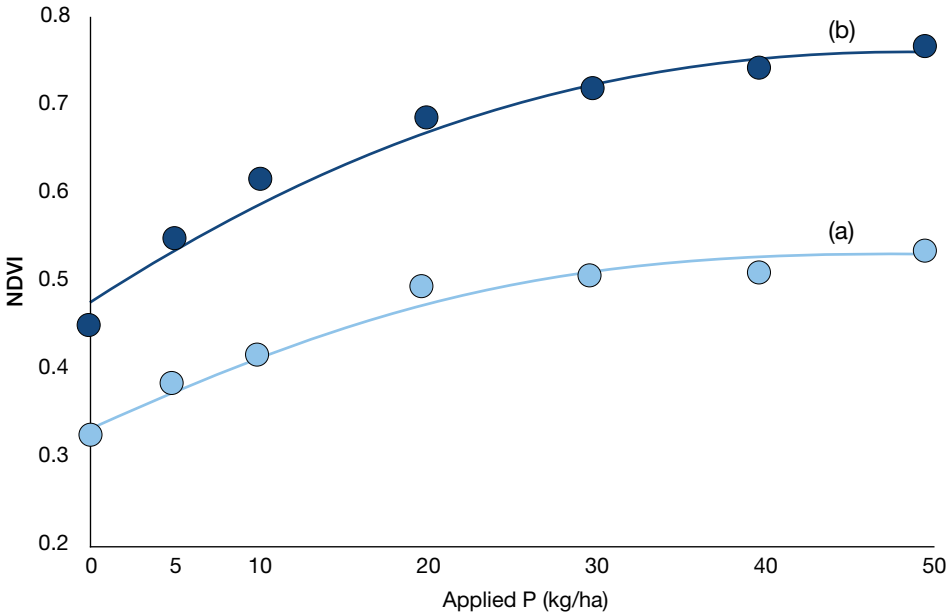


Figure 6. Wheat shoot biomass assessments on the 22/07/2021 (a) and the 09/08/2021 (b) both demonstrate a strong positive trend of plant biomass with increasing rates of P. A higher NDVI value indicates greater plant biomass and density.

Table 4. Bannister trial SUM21.05 site soil test results (nutrient analysis)

Depth cm	pH $[CaCl_2]$	P Col mg/kg	PBI	DGT-P µg/L	K Col mg/kg	S mg/kg	Org C %	EC dS/m	NO_{3-} mg/kg	NH_{4+} mg/kg	Cu mg/kg	Zn mg/kg	Mn mg/kg
0-10	5.4	39	210	11	71	12	4.5	0.11	32	1	0.6	0.5	1.0
10-20	5.0	7	204	4	39	8	1.2	0.05	11	1	0.1	0.1	0.3
20-30	5.1	5	161	4	28	8	1.3	0.04	8	1	0.1	0.1	0.3

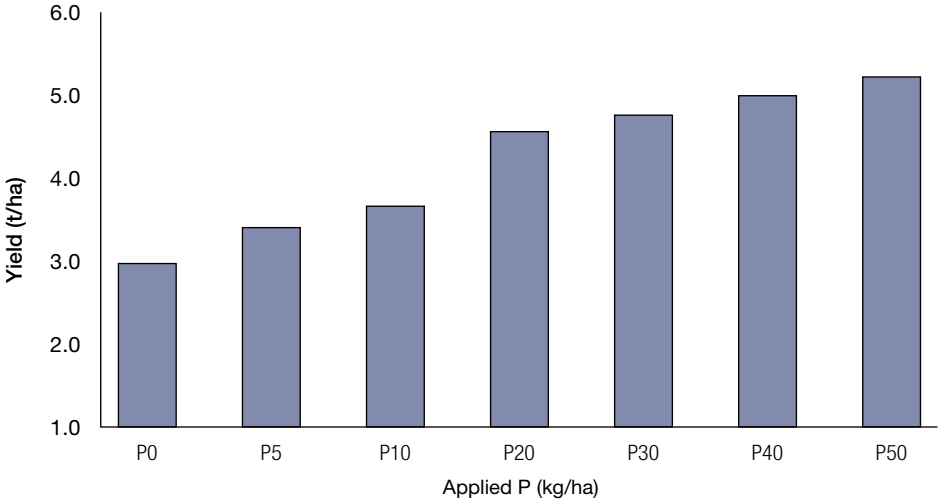


Figure 7. Wheat yields for the Bannister 2021 P site.

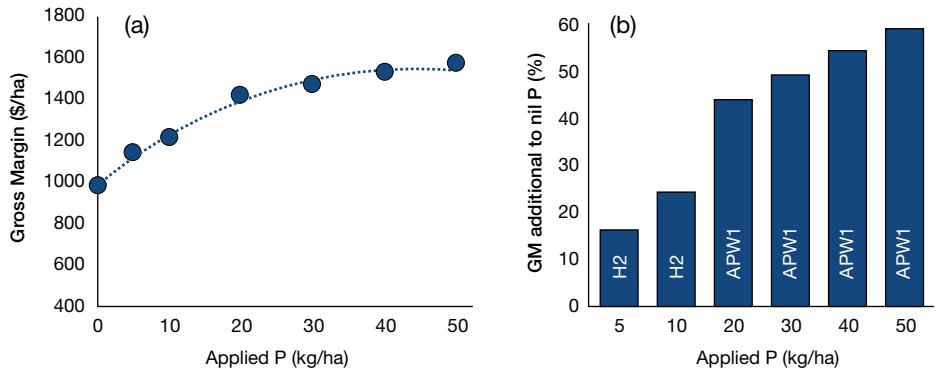


Figure 8. a) Gross margins demonstrated a strong positive trend of increasing profits with increase P rates. b) Individual treatment profits additional to the nil P control show despite grading changing from H2 to APW1 as P rates increased, profits continued to increase.

SUM21.05 trial highlights

- The Bannister trial experienced a decile 10 growing season rainfall in 2021.
- Crop emergence was not impacted by establishment fertilizer rate.
- In-season biomass assessments indicated significant increases with increasing rates of applied P up to 50kg P/ha.
- Yields were high and were significantly influenced by P rates up to 50kg/ha, ranging from 2.98t/ha when no P was applied up to 5.22t/ha with the application of 50kg P/ha.
- Soil test DGT-P of 11µg/L provided a much more indicative response predictor that Colwell P in this high PBI soil.
- Under 2021 conditions, profits increased with increasing P rates up to 50kg P/ha, which had a gross margin of $1560/ha, exceeding profits from the nil P control by 59%.

PBI, Colwell P and DGT-P explained

PBI

Phosphorus Buffering Index, or PBI, is an estimator of the soil's ability to bind P. Soils with a high PBI require more P, because more of what is applied becomes bound to soil particles.

PBI is related to the number and type of 'exchange' sites in the soil, which ultimately comes down to soil texture and composition.

Clay soils have smaller particles which means a larger surface area, and more sites for P adsorption.

Higher levels of certain compounds in the soil, such as iron oxides and aluminium oxides also cause P to bind to soil particles more strongly. The soil can rapidly capture P added by fertilizer and render it unavailable to plant roots.

Colwell P

For a long time, Summit has offered the Colwell P test as a measure of the amount of P available for plant uptake. With the Colwell P test however, values can be somewhat independent of the soil's ability to bind phosphorus.

Hence, a Colwell P test should always be interpreted in association with a PBI test. This can be problematic as these methods have been shown to overestimate available P on certain soil types, including calcareous or acidic soils, or where iron or aluminium are present in high concentrations.

Summit Fertilizers's partnership with independent soil and plant analysis laboratory APAL, offers an alternative procedure called DGT-P, to gauge plant-available soil P.

DGT-P

DGT-P is a more recently released P test offered by Summit inSITE. It differs from more conventional soil extraction methods in that it mimics the action of plant roots. An iron oxide gel disc is placed on a saturated soil sample. The gel acts as a sink, binding forms of P that are able to diffuse through the soil solution and through an additional gel membrane, just like a cell membrane in root uptake. The amount of P bound to the gel is then measured. An advantage of the DGT-P test is that the inherent properties that govern P availability in the soil will determine the test result, so testing for a second correcting factor (such as PBI with Colwell P) is not necessary.

SUMMIT CONNECT

Our online customer portal

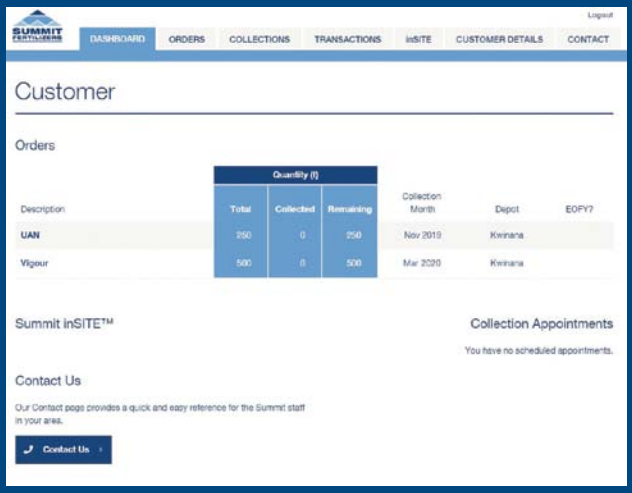
We are committed to making it as easy as possible for you to do business with us and SummitConnect, our online customer portal has a number of impressive features.

SummitConnect has a user-friendly interface with everything you need to know about your business with us in the one place.

On SummitConnect you can view:

- Orders - see details of all your orders with Summit, including collection month and payment terms.
- Collections - you can view individual fertilizer collections and download loading and weight dockets.
- Transactions - review your payments, credit limit, monthly statements and download your tax invoices.

You can even provide your accountant or consultant with access to your SummitConnect to save time when it comes to gathering financial information.



Signing up for SummitConnect is quick and easy. For further information or to register for SummitConnect, contact your local Area Manager and they'll help you get started.

SUMMIT inSITE

inSITE Soil and Plant Analysis

Joining SummitConnect is a real game changer, because it automatically links you to our inSITE platform.

Here you can view and download all your soil and plant test history, including recommendations and reports.

Another feature growers are finding increasingly valuable are trend maps. These maps allow you to visualize how soil nutrients, pH and other soil properties are tracking over time, across different depths and in different paddocks.

Ultimately our aim is to provide you with accurate data, in an easily accessible way.

Customer owned inSITE data can be viewed at any time (24/7) on SummitConnect.

Ask your Area Manager about the new DGT-P test.

inSITE Soil Analysis

Soil sampling procedures are the single most important component to getting value from soil testing, and should be considered very carefully.

Accurate analysis, interpretation and precise nutrient management can only occur with a quality, representative sample.

Summit Area Managers are trained in the best way to take soil samples and record their location, which helps build the bigger picture of your farm's soil fertility and any potential production constraints.

Soil testing predicts how much of each nutrient is likely to be available and is the best place to start fertilizer budgetting.

inSITE Plant Analysis

Plant analysis is an especially useful tool as often there are no visual signs of a nutrient deficiency (hidden hunger). Plant testing reflects what's actually available to the plant roots which can help to fine tune your fertilizer strategy.

Our Area Managers are trained in the best plant sampling techniques.

SUMMIT FIELD RESEARCH

Over the past 7 years, Summit Fertilizers has conducted close to 240 trials across the state. That makes us one of the biggest investors in crop nutrition research in Western Australia.

In 2021 there were 42 trials in the ground. It was Summit's largest trial program ever and was only possible because of the hard work, long hours and dedication of our Field Research Team and Area Managers.

Work on Top End Apex Yield continued. These trials aim to provide a range of nutrient treatments at the high end of the scale to determine the yield response potential of popular wheat varieties, often selected for their farm use based on NVT yields.

The goal is to remove crop nutrient limitations and as such, set a yield benchmark for growers as a reference point for future decision making. The high rainfall conditions of 2021 were an ideal opportunity to test existing benchmarks.

There was also a big focus on potassium nutrition. Important manganese research too continued.

Many of the ideas for trials are generated by our Area Managers, who work closely with growers to identify local crop nutrition issues.

We encourage all growers to make contact with their local Summit Area Manager, learn about our trials and about local crop nutritional issues that could be of importance to you.

SUMMIT FUEL GAUGES

Could you be getting bigger returns from your crops or pastures? Each year, Summit Area Managers put out hundreds of Nutrient Fuel Gauge strips across the state.

These strips supply a non-limiting rate of a specified nutrient or nutrients, and are read in-season with a GreenSeeker®. In the case of nitrogen, Summit's in-season N Calculator then predicts the response and calculates the rate required to achieve optimum yield and returns.

The majority of Fuel Gauges are nitrogen, as remedial action can be carried out within the season. Potassium, phosphorus, sulphur and other nutrient Fuel Gauges can also be carried out, with responses actioned for the following season.

If you're interested in having a a Fuel Gauge on your farm, or would like to learn more, contact your local Summit Area Manager.

Highest canola return comes from up-front N in

Plenty of growers took a keen interest in Summit canola trial SUM21.22 on Ashley and Stephen Lord's property north of Goomalling. The field day held by Central Ag in early spring showed the need to feed the crop early with N.

Working in with Goomalling Summit Agent - Central Ag, Northam Area Manager Brayden Noble had a 2021 trial that tested nitrogen (N) rates and timing strategies on high yield potential canola. The trial on Ashley and Stephen Lord's property north of Goomalling, was sown to 44Y27 on April 22nd.

The 3 treatments investigated were as follows:

- all N applied at seeding - some banded in the form of urea and some as UAN streamed on top;
- all N applied post-emergent in late June, just prior to budding (i.e. nil N at seeding).
- The third strategy was closer to grower practice, which was some N up-front at seeding followed by a N top-up in late June.

Total units of applied N were nil, 40, 80, 120 and 160kg/ha. A very high 200kg N/ha treatment, split evenly at sowing and post-emergent was also included as a high-end limit. In theory, 200kg if fully utilised by the crop would yield around 5t/ha.

In-season plant counts showed emergence was good across all trial treatment strategies and unaffected by fertilizer practice.

Harvest results

A decile 7 rainfall growing season for the area provided good soil moisture conditions and helped the trial achieve an average yield of 2.69t/ha. The relatively high yield of 2.31t/ha for the nil N treatment indicated mineralisation of residual soil N likely occurred in the growing season, providing a reasonable amount of N to the plants. (Figure 9).

The highest yield was 3.0t/ha when 160kg N/ha was applied upfront, a 30% higher yield than the nil N treatment.

For almost all N rates, applying all N upfront resulted in higher yields than post and split applications ($p<0.05$).

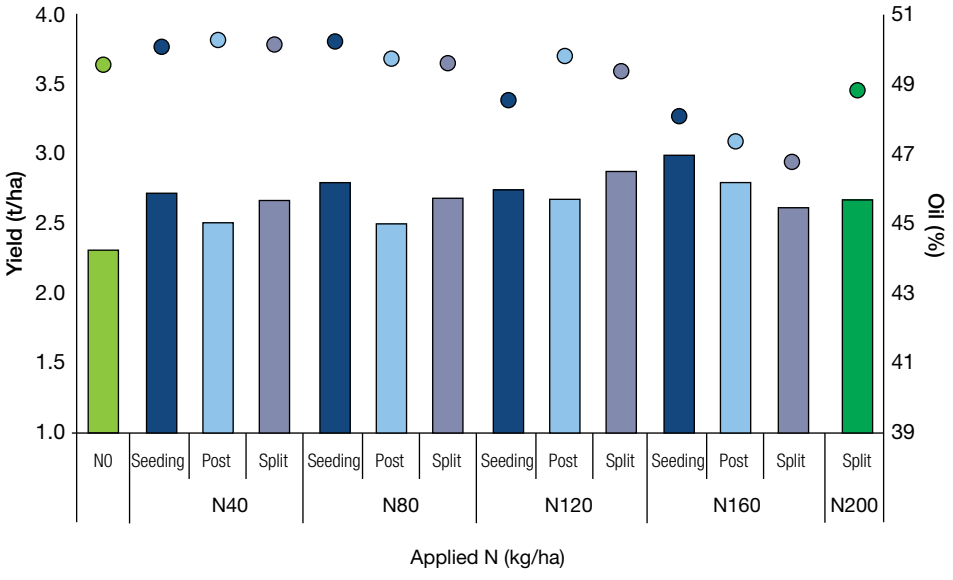


Figure 9. Individual treatment harvest yield (bars) and oil content (dots) demonstrate higher yields with N applied upfront and decreasing oil content with increasing N rates.

2021 Goomalling trial

Applying all N post-emergent in late June resulted in the lowest yields of the three strategies for all N rates, highlighting the importance of addressing canola N requirements early. Seed oil content was good across the trial, ranging from 46.8% up to 50.3%.

Yield responses to N however, were not great enough to say canola yields were significantly affected by increasing N rates (p=0.11).

Despite no significant differences in yield with increasing N rates, the high value of canola for the 2021 harvest meant only small increases in yield were enough to increase grain value enough to offset fertilizer cost.

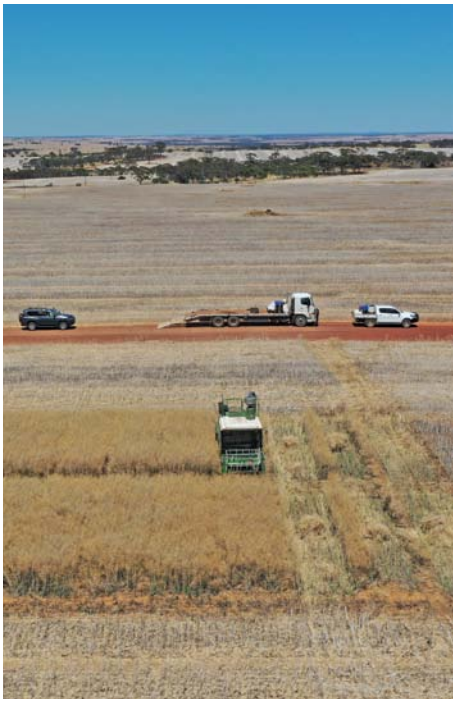
As a result, all but two treatments had better gross margins than the nil N control, with both negative results being the split N applications at higher rates (Figure 11).

As observed in the yield data, the treatments with the highest gross margins were upfront N applications, with N upfront at 40, 80 and 160kg/ha all producing the highest returns, an additional 15% compared to the nil N control. Oil content and therefore oil bonuses decreased with increasing N rate. These bonuses had little influence compared with grain value and fertilizer costs.

SUM21.22 canola trial highlights

- Plant emergence was unaffected by fertilizer practice.
- Yields ranged from 2.3-3.0t/ha and were higher when N was applied upfront.
- Increasing N rates had no statistically significant impact on yields.
- Returns from N treatments exceeded returns from the nil N control in all treatments, except when 160 and 200kg N/ha was applied in split applications.
- Under 2021 conditions, the 40, 80 and 160kg/ha N treatments with all N applied at seeding all exceeded profits from the nil control by 15%.

Growers can contact Summit Area Manager Brayden Noble, 0417 490 047 or Scott Thomson of Central Ag 0417 957 704 for more information. Link to trial video above.



Trial harvest in late November reinforced earlier Central Ag field day growth observations. In this trial, hybrid canola responded to early N, even though indications were that a significant amount of N was being made available by soil mineralisation.

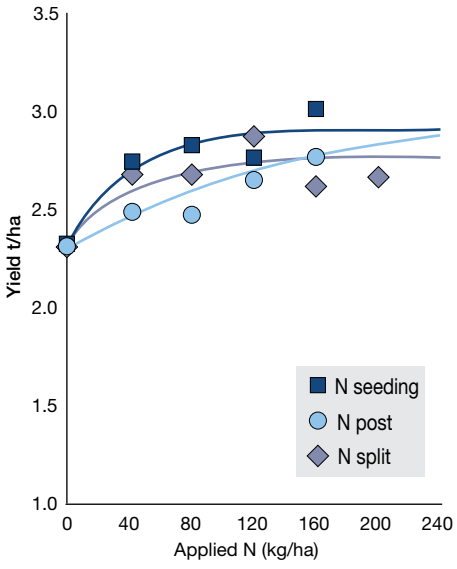


Figure 10. Yield response curves to increasing N rates for all three application strategies demonstrate a greater yield response to N applied upfront. Mitscherlich function fitted to all datasets.

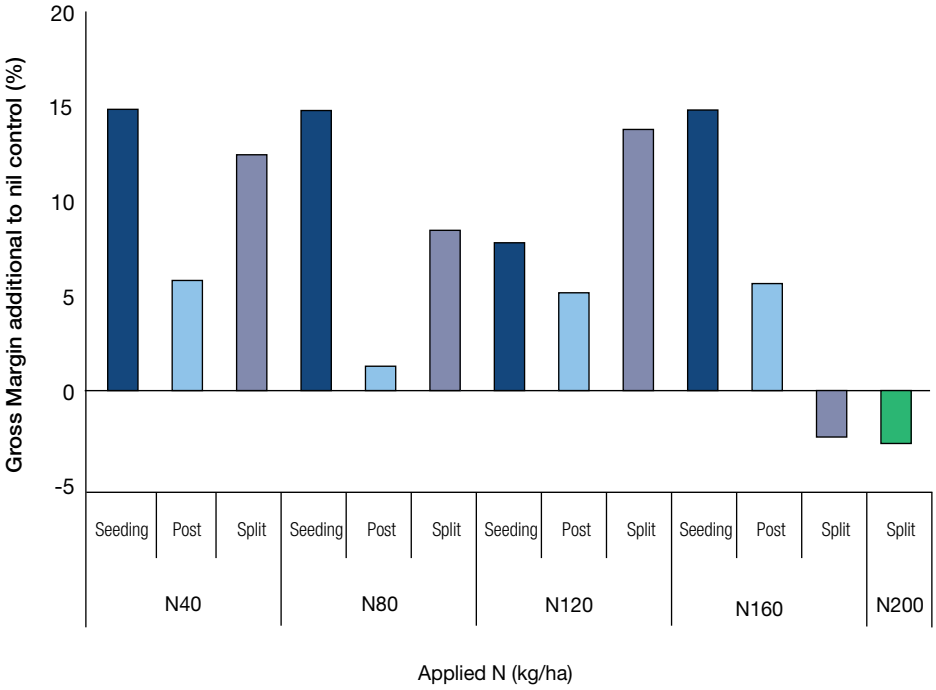


Figure 11. Individual treatment indicative gross margins additional to the nil N control.

Wyalkatchem N x K timing trial update

In the spring Summit newsletter we reported on some of Tracey Hobbs' mid-August observations on a nitrogen (N) x potassium (K) timing trial in Scepter wheat. The trial was located on a sandy site at the property of Garn Nominees, southeast of Wyalkatchem.

Sown on May 13th, there were 25 treatments overall.

K rates were 0, 20 or 40kg/ha, applied at two timings - either all at sowing or all post-sowing (July 7th - at early tillering, a critical time for K).

N ranged from 0 to 120kg/ha in 30kg/ha increments. All plots except the nil N had 30 N down the tube with the rest of the N topped-up post-sowing. P for all treatments was 10kg/ha.

In-season observations

Plant emergence at the 3-leaf stage showed a distinct trend of higher numbers in treatments that did not receive any seeding N, compared to 30kg N/ha at seeding (Figure 12).

Treatments that had nil sowing N had a plant count average of 143/m^2. Treatments that had N banded at seeding had a mean plant count of 112/m^2. However, plant numbers were all above the threshold of 100/m^2 that would limit yields.

All K rates with nil N banded at sowing exceeded the target emergence.

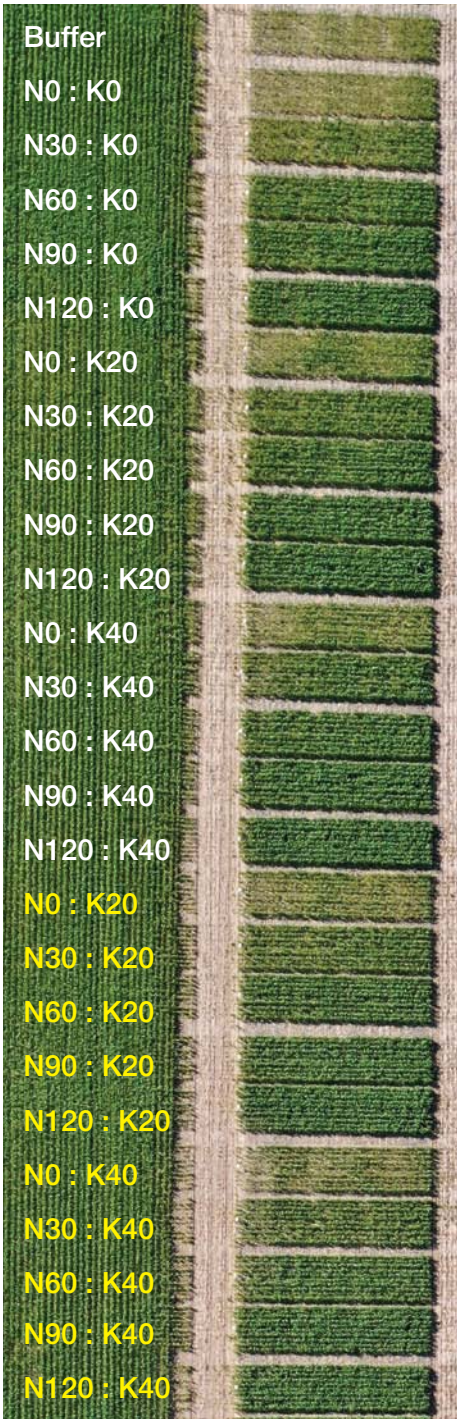
The early in-season plant counts suggested banding N at sowing had a significant impact on seedling emergence ($p<0.001$).

Increasing rates of K however had no such influence on seedling germination ($p=0.30$).

An important factor being compared in this trial was early versus later applied K. Also under investigation was how the various N x K combinations impacted on grain yield and quality.

By mid-August the trial was showing clear responses to applied N (image far left). Plots marked with white text had all their K applied at sowing and plots in yellow text received all their K post-sowing.

SUM21.11 N x K timing trial



White text - All K applied at sowing
Yellow text - All K applied post-sowing

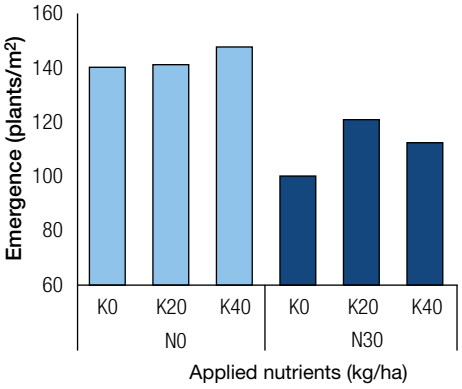


Figure 12. Plant emergence counts recorded on the 10/06/2021. Treatments that had N banded at seeding had significantly lower plant counts than treatments that did not receive N, while K rates had little effect on emergence.

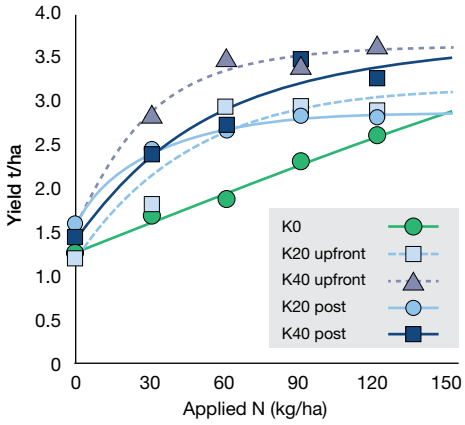


Figure 13. Yield N response curves showing increasing yields with increasing N rates up to 90kg N/ha at most K rates, and stronger responses at higher K rates. Mitscherlich function fitted.

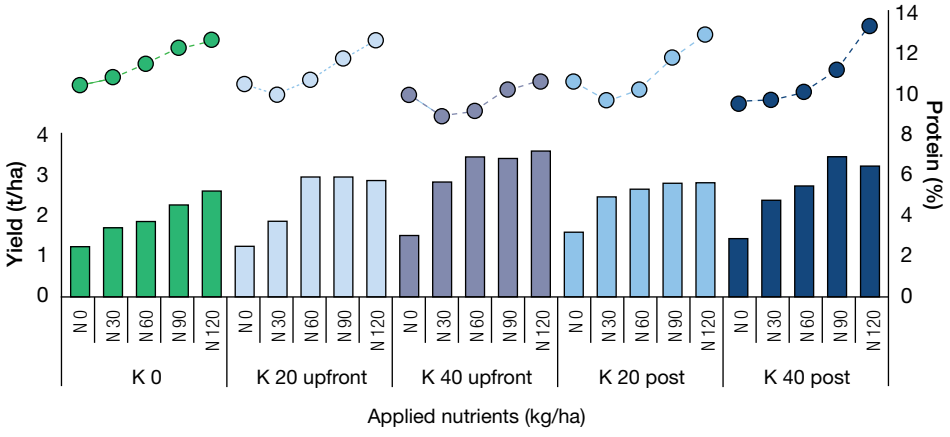


Figure 14. Harvest yield (bars) and protein (dots) show yields increased significantly with both increasing rates of N and K, and protein increased with increasing rates of N.

Harvest results

Very good 2021 growing season rainfall for the area helped the trial along and it achieved a yield average of 2.57t/ha.

Yields ranged from as low as 1.25t/ha when no N was applied (with 20kg K/ha applied upfront), up to 3.61t/ha when 120kg N/ha was applied with 40kg K/ha applied upfront, a 189% yield increase (Figure 14).

There were significant trends of increasing yields with increasing rates of both N up to 90 kg/ha and K up to 40 kg/ha.

Timing of K did not significantly influence yields.

Grain protein in this trial was strongly influenced by N rate, with protein increasing up to 120kg N/ha.

It indicated that although N only resulted in increased yield up to 90kg N/ha, it was still being taken up by the roots at 120kg N/ha, and was subsequently converted into grain protein.

Under 2021 growing season conditions, the most profitable treatment was when 90kg N/ha was applied with 40kg K/ha applied post establishment, with an indicative gross margin of $1135/ha, 215% more than the nil control (Figure 15).

The trial highlighted the importance of having the right balance between N and K in this lighter soil type.

For a short video of the trial, follow the QR code above.

For more information, Tracey Hobbs (above) can be contacted on 0429 470 007.

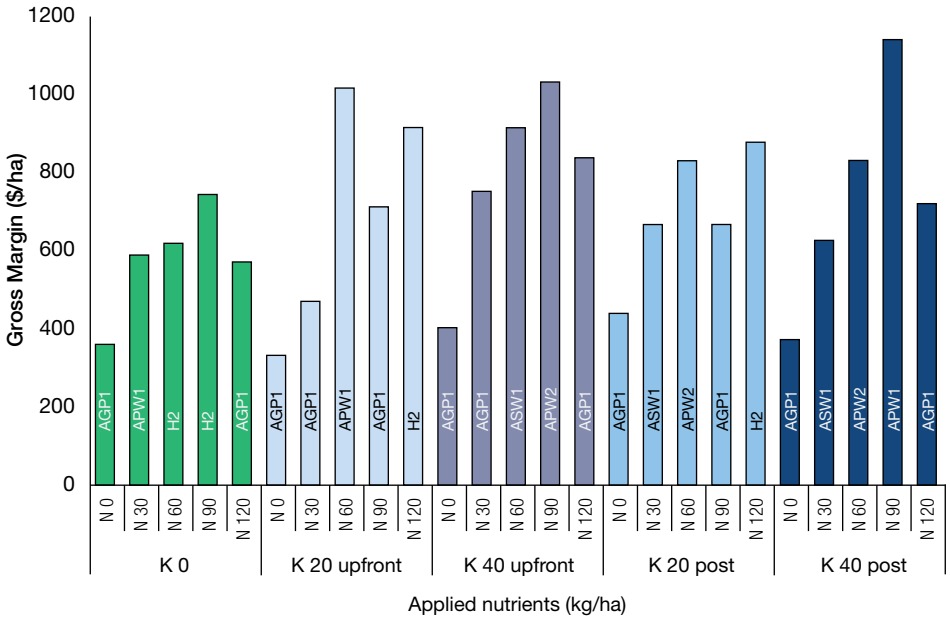


Figure 15. Gross margins demonstrate variability in grain grading and returns across the trial.

Table 5. Wyalkatchem trial site soil test results (nutrient analysis)

Depth cm	pH $[CaCl_2]$	P Col mg/kg	PBI	DGT-P µg/L	K Col mg/kg	K Exch %	S mg/kg	Org C %	EC dS/m	NO_{3-} mg/kg	NH_{4+} mg/kg	Cu mg/kg	Zn mg/kg	Mn mg/kg
0-10	5.5	38	20	142	32	68	13	0.5	0.10	5	3	0.3	0.3	4.2
10-20	5.0	33	18		25	48	15	0.2	0.08	4	2	0.3	0.1	2/8
20-30	5.1	15	13		25	42	6	0.1	0.03	2	1	0.1	0.1	1.8

The Summit Kwinana Depot now open 24/7

The Summit Fertilizers Kwinana operations team has moved to a 24/7 roster, with the depot now open for collection appointments at all times day and night, all year long. This move is part of our commitment to the ease of doing business. Our sheds are well stocked with cropping fertilizers and we encourage customers to collect their fertilizer as soon as practical. The new opening hours should make life easier for both growers and carriers, especially during the busy times of the year.

Your soil information anywhere anytime

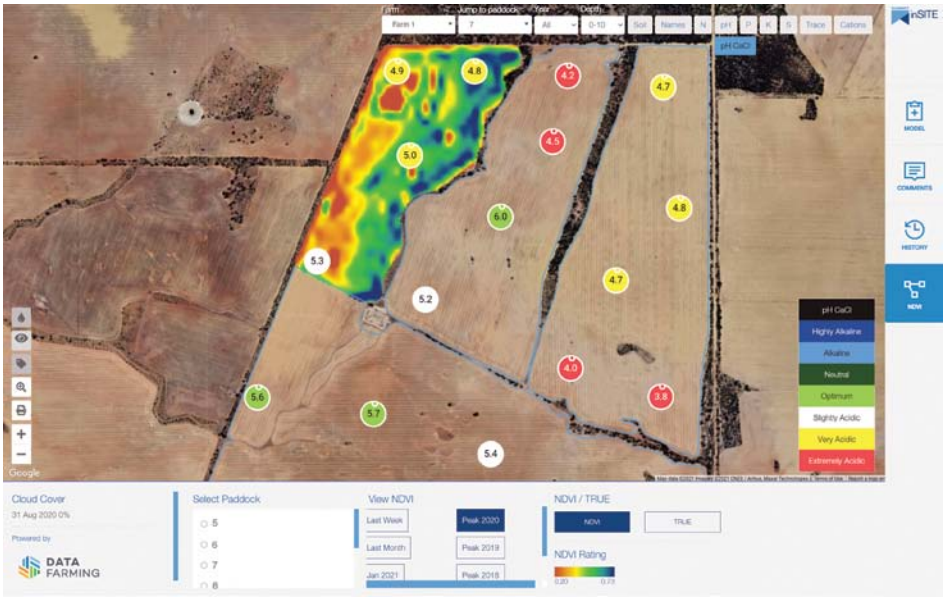
Growers can connect with Summit anywhere at any time.

SummitConnect is your link to our inSITE platform, so you can view and download your entire soil and plant test history, including recommendation reports.

An exciting inSITE feature is trend maps, which allows you to visualize how soil nutrients, pH and other soil properties are tracking over time, across different depths and in different paddocks.

Ultimately our aim is to provide you with the most accurate data, in the most accessible way, enabling you to make better fertilizer decisions.

Vital information at your fingertips!



A SummitConnect trend map showing pH results at 0-10cm depth across all years.

Summit welcomes Dennika and Sam

Dennika Reynolds joined the Summit Area Manager team in December last year taking over from Jarrad Martin. Her area covers the shires of West Arthur, Williams and Boddington.

She has a strong passion for agriculture, having grown up and worked on the family farm in Kalannie in the central wheatbelt.

Dennika is keen to support growers in her region and work alongside them to help increase productivity and profitability.

She can be contacted on 0427 788 521 or dreynolds@summitfertz.com.au

Sam Marsh recently graduated from Curtin University with a bachelor degree in Agribusiness. He has a keen interest in agricultural research and is looking forward to using his skills in his new role with our technical services team.

Growing up in Denmark, Sam attended Denmark Ag College and spent a gap year working on various farms in the Great Southern, before moving to Perth to complete his degree. Outside of work he enjoys spending time at the beach surfing or swimming, tinkering with technology, four-wheel-driving and videography.

Easy to use fertilizer calculators

MAXamFLO and UAN are sold by weight and used by volume. Hence, converting between tonnes and litres (or vice versa) is often required when budgeting for and using these liquid fertilizers.

Taking this into account, Summit has developed a series of easy-to-use fertilizer calculators that are available on our website.

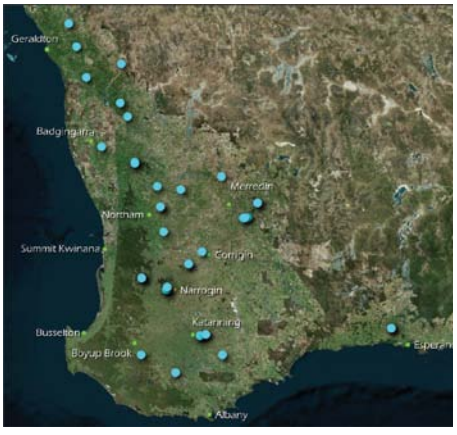
Our calculators make answering questions, such as these a breeze!

- How many litres are there per tonne of UAN or MAXamFLO?
- How much Urea, UAN or MAXamFLO do I need to apply to meet my target N rate?
- How much liquid fertilizer will I use at a particular application rate and paddock size?

Find the answers at
www.summitfertz.com.au/field-research-agronomy/fertilizer-calculator

Now's the time to plan Fuel Gauges

Farmers often ask us, when is the best time to put down a Fuel Gauge test strip? The answer is quite simple...the closer to sowing the better. So if you want to make a plan and take advantage of this extremely useful tool, contact your local Summit Area Manager. They have all the necessary equipment.



Summit had 42 trials in 2021 across the State along with countless Fuel Gauges. Many of the locations pictured above have multiple trials. Trial results can be accessed from the Summit Fertilizers website.

Your Local Summit Fertilizers Area Manager

GERALDTON
Shane Turner
0429 947 919

COOROW
Juliet McDonald
0429 945 332

WONGAN HILLS
Saritha Marais
0429 579 541

MOORA
Brett Beard
0429 900 607

NORTHAM
Brayden Noble
0417 490 047

KELLERBERRIN
Tracey Hobbs
0429 470 007

MERREDIN
Kobus Marais
0427 766 508

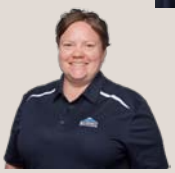
WILLIAMS
Dennika Reynolds
0427 788 521

CORRIGIN
Steve Cooke
0429 934 243

LAKE GRACE
Brett Coxon
0427 766 506

ESPERANCE (WEST)
Tim Donkin
0408 092 355

ESPERANCE (EAST)
Nick Donkin
0428 715 045



KOJONUP
Chloe Turner
0447 469 245

BUNBURY
Ralph Papalia
0427 766 535

ALBANY (EAST)
Andrew Wallace
0427 083 820

ALBANY (WEST)
Mark Ladny
0498 223 421

SUMMIT FERTILIZERS

www.summitfertz.com.au

Summit Fertilizers - 29 Ocean St, Kwinana Beach, WA 6167
ABN 49 058 794 737