Autumn 2023

Fertilizer News

Huge investment in Kwinana UAN storage

At Summit, we are excited to announce that a huge multimillion dollar development is well underway to expand our capacity to store and supply liquid UAN (Urea Ammonium Nitrate). The development will add a further 50,000 tonnes of liquid UAN storage capacity.

Over the past decade there has been an ever constant increase in demand for liquid fertilizers, in particular UAN.

This growth in popularity can be largely put down to UAN's ease of storage and handling, uniformity in application, and compatibility with a wide range of commonly used crop protection products.

What we have also seen in recent years, is that the global fertilizer market has experienced some severe supply chain disruptions, brought about by issues like the COVID pandemic and overseas geopolitical tensions.

Excavation commences at the new storage site. Milestone Services Managing Director/ Project Manager Lee Benger (left) and Summit Fertilizers Executive Manager of Engineering Phil Hargreaves.

Our most recent investment will help sure-up our ability to store UAN, and greatly improve our supply chain resilience for the future.

We are currently in the process of building two storage ponds located adjacent to the Kwinana Depot.

Construction of the new facility began in July 2022.

Continued next page

Inside this issue!

The site in mid-January 2023. This is an exciting project, designed to meet the changing needs of WA agriculture and is set to benefit growers.

Continued from front page

Since then, the site has been cleared, levelled and all major excavation earthworks have been completed. The next step is liner installation and pond cover.

It is estimated that the new facility will be commissioned in August of this year and will serve to greatly expand our storage capacity.

We would like to thank the great work of our main project management and execution team, and Perth based project and engineering company, Milestone Mining Services.

Kwinana depot open 24/7

Last season's high grain production and extended harvest has meant a slower start to fertilizer despatches across WA this year.

With most growers gearing up for seeding, our depots are now at peak capacity and operations staff are working as efficiently as possible to ensure product is on-farm in time.

A fast, efficient fertilizer despatch is a hallmark of Summit operations, and our aim is to ensure non-stop truck movement through the depot with a well-designed layout and loading facilities that are second to none.

It's all part of our commitment to ease of doing business.

For transport companies and farmers alike, we realise that 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 we have tackled the issue of moving big volumes of fertilizer is through building more flexibility into our procedures and by opening the Kwinana Depot 24 hours a day, seven days a week throughout the year.

We would like to remind growers our Summit Fertilizers Kwinana Depot is open 24/7, with collection appointments at all times day and night.

Many drivers prefer to load at night, when there is less traffic on the roads.

They say they can save themselves up to an hour and a half by not being in heavy traffic at peak times, and in that scenario there is a lot less stress for the driver if that's the way they prefer to do it.

If you haven't done so already, make sure to get your collection appointments organised by getting in touch with the Summit Depot.

A return to normal with fully compounded Summit fertilizers ready for pick-up

IT is great news for growers who have established high yielding crops in the past with MAPSZC, DAPSZC and other fully compounded Summit fertilizers, that new stocks are in our depots ready for pick-up.

It will be a welcome return to normal seeding for many.

Testing has shown just how good the new products are. For example, lab analysis shows our 2023 MAPSZC has greater than 90% of granules within the 2 to 4mm size range, and an average granule hardness of 4.5kg.

With even sized granules and very good levels of copper (Cu 0.2%) and zinc (Zn 0.4%) compounded into every granule, MAPSZC handles conditions other fertilizers can't, especially where seeding conditions can be difficult due to moisture or high humidity.

The combining of sulphur (S), Cu and Zn during manufacture gives a far superior distribution in the soil compared to many other products.

High P levels mean seeding rates with MAPSZC can be kept to easily manageable quantities. Rates of 50 to 80 kg/ha are common with this concentrated product, which also helps reduce storage and freight costs and minimise refilling at seeding.

The high quality of MAPSZC allows it to be safely blended with MOP to provide a low volume solution to supplying N, P, K and S, plus Cu and Zn at seeding.

Other unique Summit products available now for pick-up include Vigour, AllRich, MAP & Zn and MAP Cu & Zn.

MAPSZC was developed by Summit to meet the needs of our clients. Over many years it has built a reputation as one of the most reliable and popular cropping fertilizers. MAPSZC is suited to all crops, in particular wheat, barley and canola.

The fact that MAPSZC stores and handles so well means it is one product that is suited to early collection.

Some of the Summit cropping fertilizers that have nutrients compounded into every granule.

Product	Full compound	Typical analysis (%)							Bulk Density t/m³
		N	P	K	S	Cu	Zn	Mn	
MAPSZC	Yes	12.0	21.0		4.0	0.20	0.40		1.03
DAPSZC	Yes	16.0	18.8		8.0	0.10	0.20		0.98
MAP Cu & Zn	Yes	10.5	22.5		1.0	0.32	0.64		0.95
MAP & Mn	Yes	9.0	18.8		11.0			4.0	1.00
MAP & Zn	Yes	11.2	22.4		1.9		0.50		0.95
AllRich	Yes	16.0	8.7		12.5				1.00
Vigour	Yes	10.0	12.0	12.0	5.0	0.10	0.20		1.03

Will applying K pay its way this season?

By Wayne Foot
Northern Regional Manager
Summit Fertilizers

There has been a lot of talk in recent months on potassium (K) nutrition and current prices. Growers obviously want to make the best fertilizer choices for 2023, and they can only make those decisions based on the best information we have at hand.

It led me to recalculate the return on investment (ROI = grain value less K and N cost) of Tracey Hobbs' 2021 nitrogen (N) x K Wyalkatchem trial.

Trial yield information is shown in the figure right, and the table below details the ROI of the three K rates (applied up-front) and five N rates.

The phosphorus rate for all treatments was 10kg/ha.

I thought it would be interesting to compare the return on fertilizer investment for the prices that existed in 2021 against up-to-date 2023 values.

Coming off some good summer rains the trial was sown on May 13th to Scepter wheat. February to October rainfall for the area was 445mm with some excellent yields achieved.

In scenario 1, the Summit Fertilizers list price in April 2021 was used to calculate K and N costs. Grain values were based on Kwinana deliveries on November 18, 2021.

For scenario 2, March 2023 prices for fertilizer and Kwinana grain prices were used.

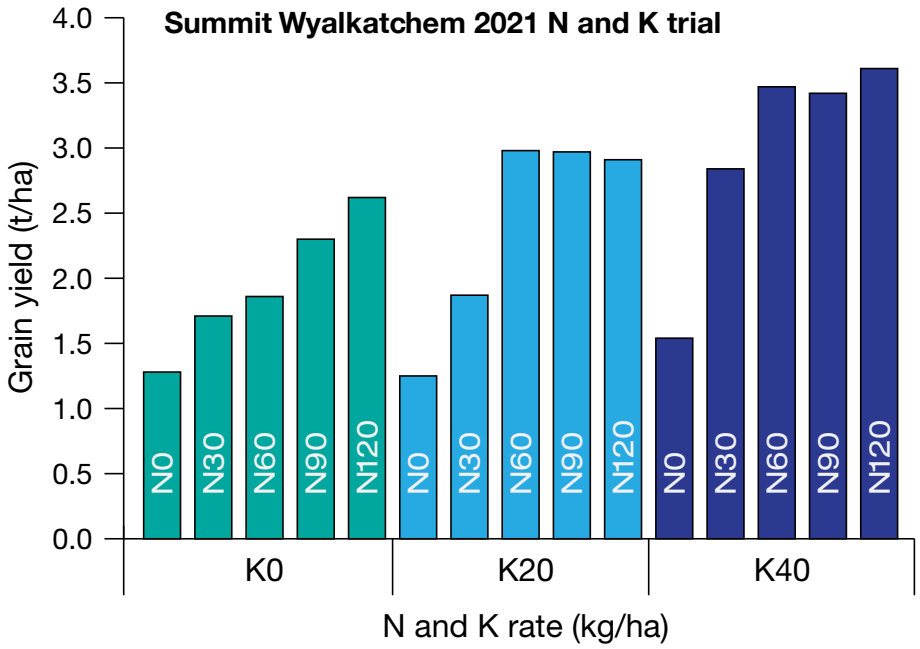
The trial showed yield responses to both applied K and N.

Importantly, the ROI calculations (see table below) showed yield alone didn't tell the whole story, and grain quality also had a significant influence on crop returns.

The key message would be that well balanced nutrition will remain the best nutrition for the coming season.

For example, while the grain yield for the K0 x N120 treatment was relatively good, the cost of extra N and downgraded grain quality punished the ROI. Increasing the fertilizer cost in scenario 2, didn't really change the order of results when it came to ROI, because there was more to be factored into the equation than just the direct cost.

If your soil has shown it is K responsive, it will remain an important nutrient this season.



Nutrient rate (kg/ha)		Wyalkatchem 2021 trial yield (t/ha) and grade		Fertilizer cost ($/ha)		Grain value less fertilizer cost ($/ha)	
K	N			April 2021	March 2023	Scenario 1 Grain value (2021) less fert cost (2021)	Scenario 2 Grain value (2023) less fert cost (2023)
0	0	1.28	AGP1	35	60	362	435
0	30	1.71	APW1	86	114	587	679
0	60	1.86	H2	139	179	616	688
0	90	2.30	H2	191	245	739	823
0	120	2.62	AGP1	243	309	569	706
20	0	1.25	AGP1	57	111	331	374
20	30	1.87	AGP1	109	165	470	561
20	**60**	**2.98**	**APW1**	**161**	**230**	**1014**	**1154**
20	90	2.97	AGP1	213	296	707	856
20	120	2.91	H2	265	360	912	991
40	0	1.54	AGP1	79	162	399	436
40	30	2.84	AGP1	131	215	749	886
40	**60**	**3.47**	**ASW1**	**183**	**281**	**911**	**1067**
40	**90**	**3.42**	**APW2**	**236**	**346**	**1029**	**1199**
40	120	3.61	AGP1	287	411	833	991

New agricultural lime supply near Albany

Great Southern Lime in conjunction with Summit Fertilizers are pleased to announce that the Nullaki lime pit is now fully operational.

The new lime pit is located on the Nullaki peninsula, west of Albany and south of Denmark. With limited other lime sources nearby, this offers a fantastic opportunity for local growers to make significant savings on freight costs. It may also enable some farmers to apply lime to increase or maintain soil pH where they have previously considered it uneconomic to do so.

Testing has shown the lime to be of high quality, with a weighted average neutralizing value of 79%.

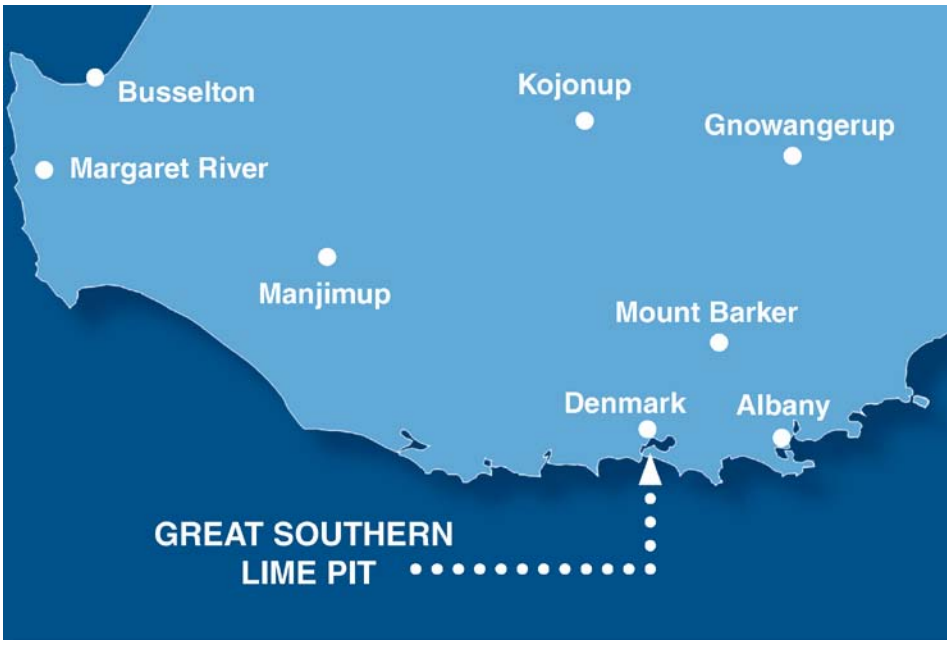
This new supply has arisen from a long-term development project that required considerable time and investment to gain government approvals, to allow the potential lime pit to be mined, processed and transported off-site to farming properties.

Operations are limited to strict conditions including;

- Extraction not to exceed 50,000 tonnes in any 12 month period;
- Laden truck movements from the site to not exceed 14 per day.
- The lime pit is only open for 4 months of the year, from the start of January through to the end of April.

Collection appointments are still available for this season, with Summit Fertilizers acting as the exclusive sales agent for Great Southern Lime.

Bookings can be made via the Albany Depot on 6819 6300 or email: albany@summitfertz.com.au.



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

Happy retirements and warm welcomes in the north

After close to 25 years with Summit Fertilizers, Shane Turner has retired. Shane started with Summit back in 1998, and we would like to thank him for the dedication and hard work he has given to Summit and clients in the Geraldton region. Shane has moved to the Mandurah area and we wish him all the very best in his retirement.

Alongside Shane, long standing Summit Agents Rick and Kerry Hasleby from Hasleby's Hardware in Northampton have also transitioned into retirement. Hasleby's Hardware was established in 1988 and became a Summit Agent in 1991 through SBS IAMA. Shane, Rick and Kerry enjoyed a close working relationship for more than 24 years and together provided a strong support network to growers in the Northampton area. Rick and Kerry plan to stay in Northampton and are looking forward to traveling and supporting Fremantle Dockers in their retirement.

Murray McCartney has been appointed as the new Summit Geraldton Area Manager and we are delighted to have him on-board with us. Murray is already well known in the region, having previously worked as a local sales manager in the agricultural chemical industry. He is actively involved in the family farm and has an agriculture degree from UWA. Murray is keen to get to know clients in his area and help growers in making the best decisions when it comes to managing their soil nutrition. He can be contacted on 0429 947 919, mmccartney@summitfertz.com.au.

Supporting Murray is our new Summit Agent, Brett Lines, based in Narngulu just outside Geraldton. Murray and Brett had an established working relationship prior to their new roles and are looking forward to working together in assisting growers with their fertilizer and technical service requirements. Brett was born and bred in Ballidu and spent 16 years in agricultural sales and management in Wongan Hills and Geraldton prior to establishing his own business, Agri Gain at the start of this year.

As an independent rural merchandise supplier, Agri Gain is available to provide a variety of farm inputs, including our wide range of quality fertilizers for cropping and pasture production. We've been working with Brett since he first established Agri Gain and wish him every success with his new business. Brett's contact number is 0457 255 727.

Shane Turner (centre) alongside Rick and Kerry Hasleby.

Summit Geraldton Area Manager, Murray McCartney (left) alongside Brett Lines from Agri Gain.

Another welcome addition to the Geraldton team is Bo Rennie, who has taken up the role of Customer Service Officer alongside Michele George in the Geraldton Depot. Bo has a professional background in customer service and is looking forward to getting to know all the local clients.

Bo Rennie at the Summit Geraldton Depot. For fertilizer collection appointments, growers can contact Bo on 9960 8100.

You can now share your soil and plant test data with our updated app

We've been busy improving our Summit Fertilizers App, to help make doing business with us even easier. Our latest update allows customers to share their SummitConnect and inSITE data with third parties if they want to.

All soil and plant test results in inSITE are owned by customers, and our new functionality makes it easier to securely share this data with your business partners such as agronomists and agricultural consultants.

We've designed the app for optimal viewing of SummitConnect on mobile and tablet devices, and the user-friendly interface allows the app to be easily navigable, with everything you need to know about your business with Summit in one place.

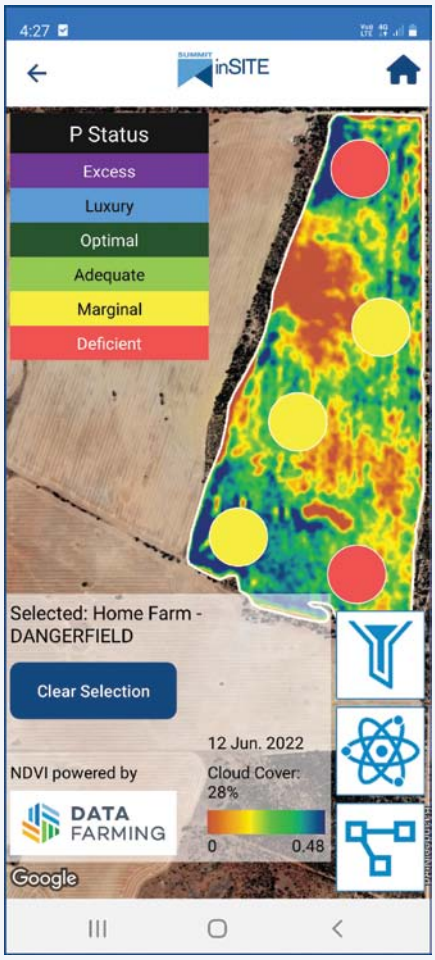
On the Summit Fertilizers App you can view your:

- Orders - see details of all your orders with Summit, including collection month and payment terms.
- Collections – keep on top of individual fertilizer collections and download loading and weight dockets.
- Transactions - review your payments, credit limit, monthly statements and download your tax invoices.
- inSITE Soil & Plant test history and recommendation reports.
- Summit trend maps – get a visual interpretation of soil test results across different depths and growing seasons, so you can see how your farm is tracking over time. We've also integrated freely available NDVI biomass satellite imagery through our partnership with DataFarming.

The Summit Fertilizers App also contains a range of useful tools and information, such as product analysis data, nitrogen and liquid fertilizer calculators and our liquid fertilizer and pesticide compatibility checker.

To download the app, simply search for Summit Fertilizers in either Google Play or the Apple App store.

If you're a Summit customer and you haven't signed up to SummitConnect yet, getting started couldn't be easier.



Get in touch with your local Area Manager to register, or call our Customer Support Centre on (08) 9439 8999.

Farewell to Liong

We would like to give a special mention in this newsletter to Liong Cheah, who has recently retired from Summit.

Liong joined Summit Fertilizers in 1989, when the company was first formed and worked for us for more than 33 years.

He started at Summit as an accountant and moved into the role of Chief Financial Officer in 2004.

Liong has experienced the complete evolution of the business and worked as a key part of the Summit team to help guide the company through the many twists and turns over the past three decades, including rapid growth in the initial start-up period, the GFC in 2008-2009, and the COVID-19 global pandemic.

Liong Cheah at Summit head office in 1993.

In his well-deserved retirement, Liong plans to spend more time with his family, travel and some social golf plus a lot more walking.

We wish him all the best and he will be sorely missed by everyone at Summit. Liong's successor, Rebecca Harris has now taken up the reins to lead the finance and admin team.

SUMMIT inSITE

Soil test with inSITE, the industry leading soil analysis program.

Benefits include:

- Independent laboratory
- Fast turnaround times
- Wide range of analytes measured.
- Recommendations based on results
- Support from your experienced local Area Manager
- View results on SummitConnect
- Customers own their data

Response to N and P at Carrabin

The 2022 Summit trial at Carrabin assessed the response of Scepter wheat to applied nitrogen (N) and phosphorus (P) and aimed to improve our overall understanding of optimal rates for wheat yield, grain quality and the most profitable returns.

The large number of N and P trials completed over the years, across a wide range of soil types and rainfall deciles is helping us build a comprehensive data set.

It all feeds into the Summit inSITE soil test recommendations given by our Area Managers.

Sown in mid-May, the Carrabin trial was on a loamy-sand with low Colwell P soil test result (P Col 13 mg/kg at 0 to 10 cm).

It contained 18 treatments, with P rates ranging from 0 to 24 kg/ha and N rates ranging from 0 to 125 kg/ha.

Results

An above average, decile 8 growing season rainfall resulted in yields ranging from 1.2 to 3.6 t/ha.

Yields increased significantly with increasing P and N rates, up to 18 kg P/ha and 75 kg N/ha.

The interaction between the two nutrients was also statistically significant i.e.

- Where no N was applied, yields remained relatively consistent as P rates increased.
- Where 25 kg N/ha was applied, yields increased slightly to 6 kg P/ha.
- Where at least 50 kg N/ha was applied, a yield response was observed up to 18 kg P/ha, and even up to 24 kg P/ha where 125 kg N/ha was applied.

Grain protein was also variable across the trial, ranging from 8.1% up to 9.6%. Across most P rates, there was a trend of higher protein with increasing N rates.

Gross margin returns on N and P investment were influenced by both nutrient responsiveness in yield and protein.

With significant N and P yield responses, the most profitable treatment was when 18 kg P/ha and 75 kg N/ha was applied. This had an indicative gross margin of $855/ha and was $480/ha more than the nil P, nil N control.

Kobus Marais, Summit Fertilizers Area Manager, Merredin, had N and P trials at Carrabin and Merredin in 2022. For more information on these trials, growers can contact Kobus on 0427 766 508.

Summit soil analysis

Summit soil testing will provide a guide as to whether you need to apply additional nutrients to maintain productivity.

It assists in deciding how much fertilizer to apply as it measures the quantities of available nutrients in the soil and where in the soil profile they are located.

The analytical results are interpreted using models developed from trials conducted in WA. These models also take into account the potential yield, soil type, past crop rotations and soil constraints like pH or aluminium levels, to determine a fertilizer recommendation for the coming year. Your local Summit Area Manager can provide more information on the impact of nutrient removal after last year's crop.

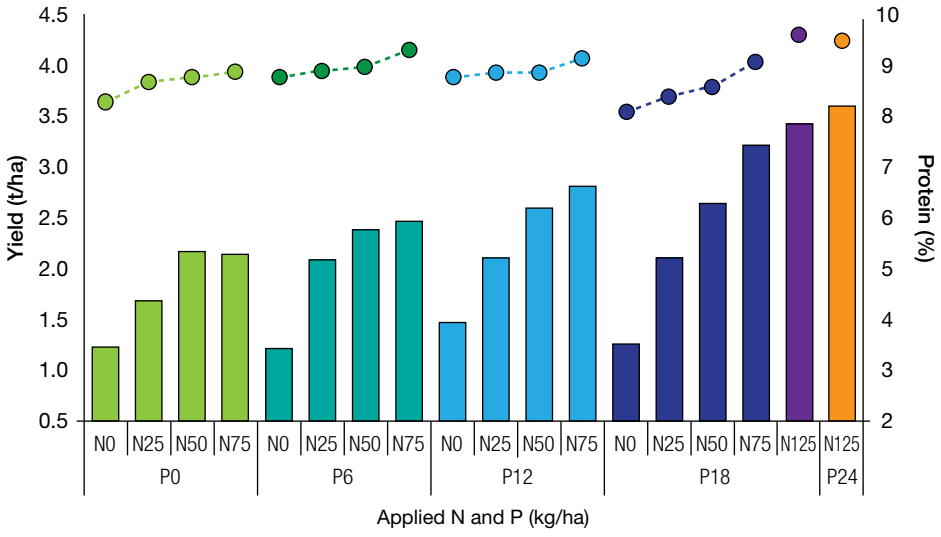


Fig 1. Scepter wheat harvest yield (bars) and protein (dots) for the 2022 Carrabin N and P trial.

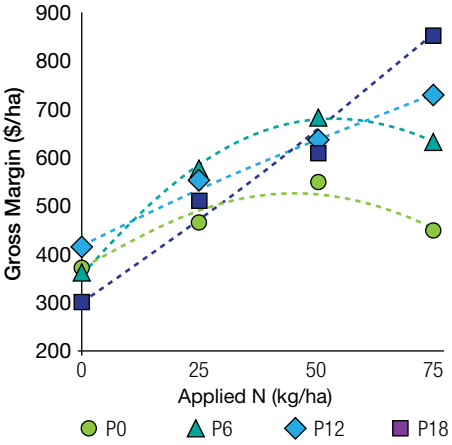


Figure 2. Individual N gross margin responses demonstrate the increases in average gross margin returns with N rates.

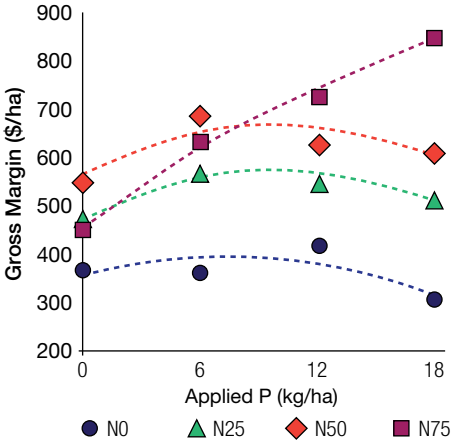


Figure 3. Individual P gross margin responses showed a relatively smaller increase in returns, except where 75kg N/ha was applied.

N and P response at Merredin in low PBI soil

Last season a Summit trial at Merredin assessed the response of Buff barley to nitrogen (N) and phosphorus (P). A key point of difference between this site and the Carrabin trial was much higher soil Colwell P values (31 mg/kg at 0 to 10cm) with a very low phosphorus buffering index (PBI) of 30. Hence, it was not predicted to be P responsive.

In total there were 18 treatments, with P rates ranging from 0 to 24 kg/ha and N rates ranging from 0 to 100 kg/ha.

Results

Favourable conditions and decile 10 rainfall for the growing season resulted in a relatively high average trial yield of 3.7 t/ha.

Increasing N rates, resulted in huge increases in yield, with yields responding up to 100 kg N/ha.

As predicted by Summit inSITE soil testing, the trial was unresponsive to P applications.

However, it is important to bear in mind the nutrient removal of P in barley, which is approximately 2.9 kg/t.

With high yields in 2022 a considerable amount of soil P would have been extracted, which could lead to run-down over time if continuously low amounts of P were applied.

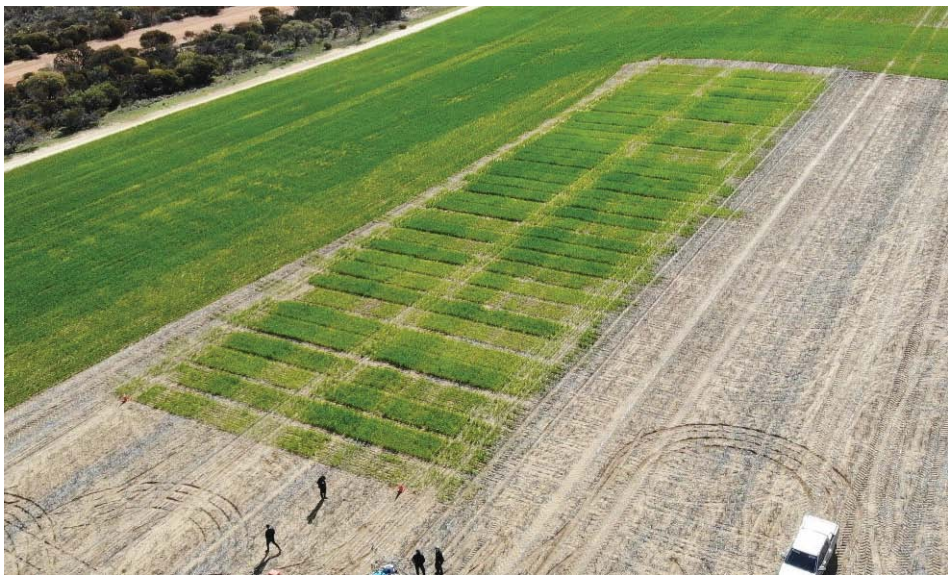
At the time of harvest, Buff barley was in the stage two of the Barley Australia malt accreditation process, with the earliest possible accreditation date being March 2023.

As a result, all treatments were only receivable as feed grade barley in 2022, meaning yield was the primary factor in this trial to influence grain returns.

Return on N and P investment

The lowest return was $705/ha when 18kg P/ha was applied without N, while the most profitable treatment was $1320/ha when 6 kg P/ha was applied with 60 kg N/ha, a 58% additional return to when no P or N was applied.

Good yield responses to increasing N rates were reflected in the average gross margin response which showed profitability increases with higher N rates up to 60 kg N/ha.



The 2022 Merredin N and P in Buff barley trial in late July showing good responses to treatments.

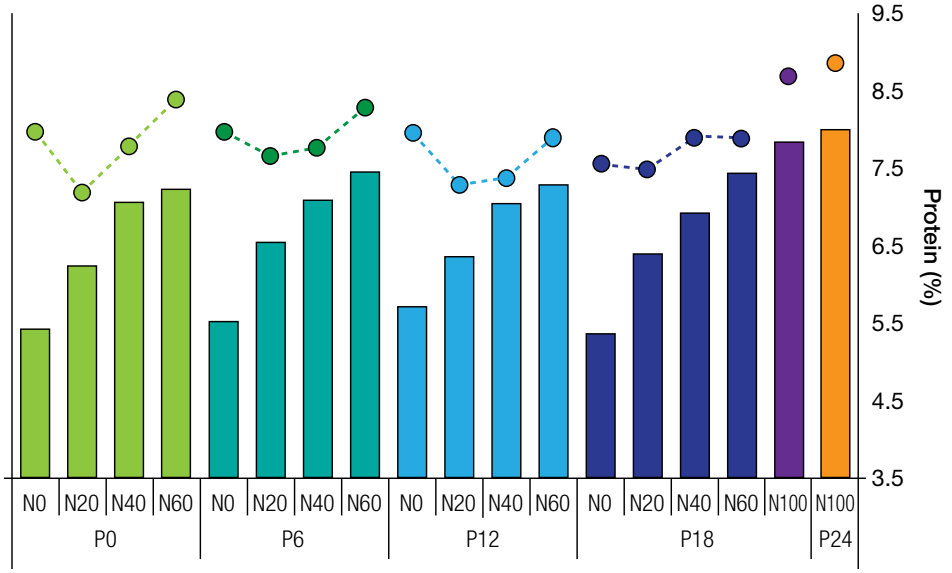


Figure 4. Buff barley harvest yield (bars) and protein (dots) for the 2022 Merredin N and P trial.

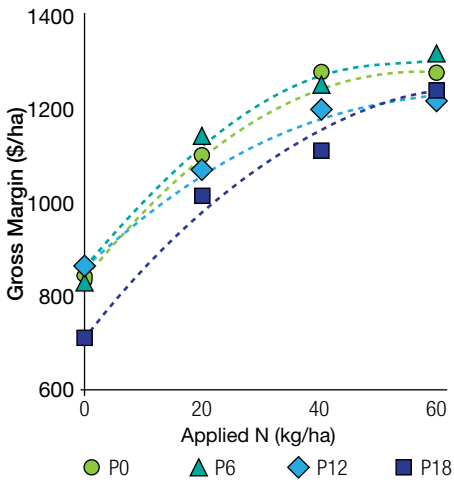


Figure 5. Individual N gross margin responses demonstrated increases in average gross margin returns with N rates.

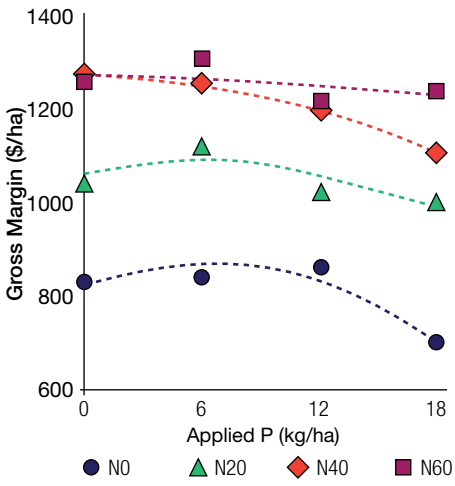


Figure 6. Individual P gross margin responses declined with increasing P rates.

Optimising N and P at Regans Ford in a high input

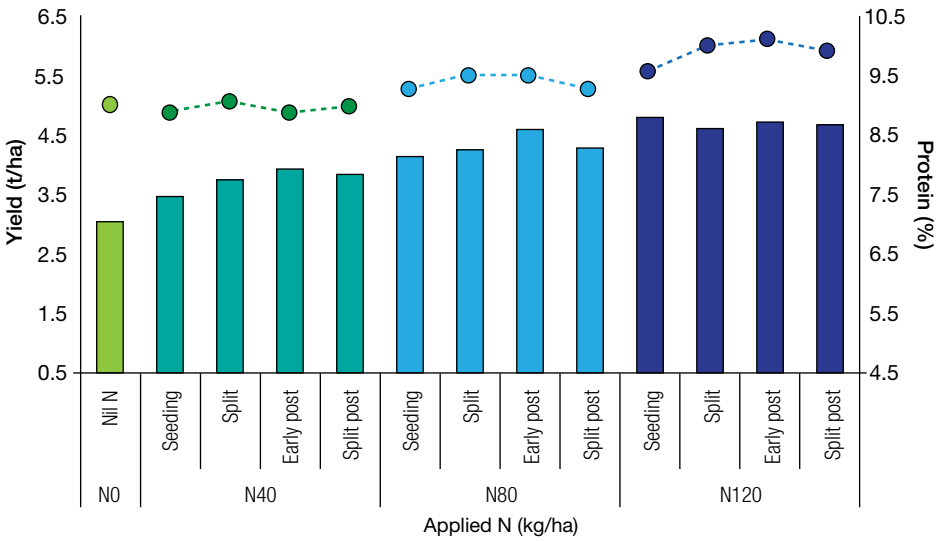


Figure 7. Calibre wheat harvest yield (bars) and grain protein (dots) to N rates and strategies.

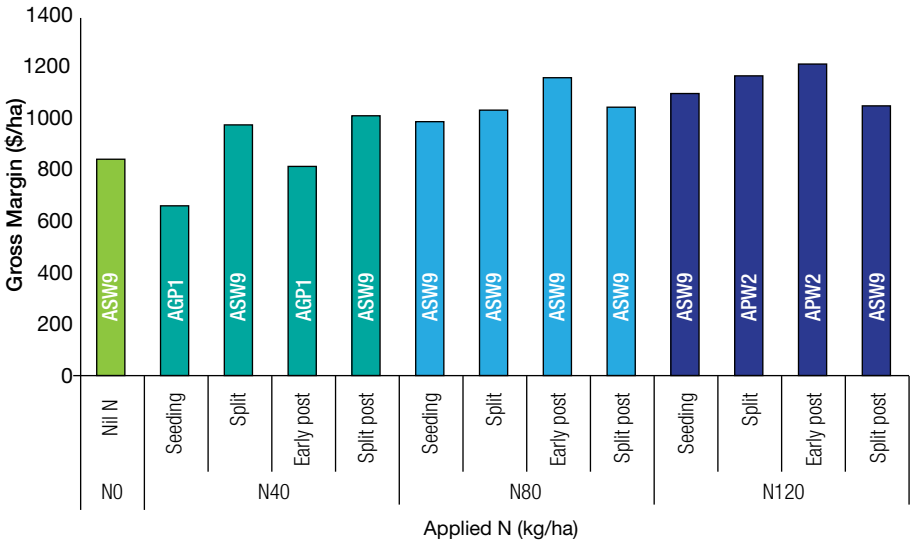


Figure 8. Gross margins and grain grades across the different treatments.

Brett Beard, Summit Fertilizers Area Manager Moora, initiated several trials last season to help investigate a range of crop nutrition issues facing his local farmers.

Two of the trials were at the Regans Ford West Midlands Group trial site. Both were sown to Calibre wheat on May 21st.

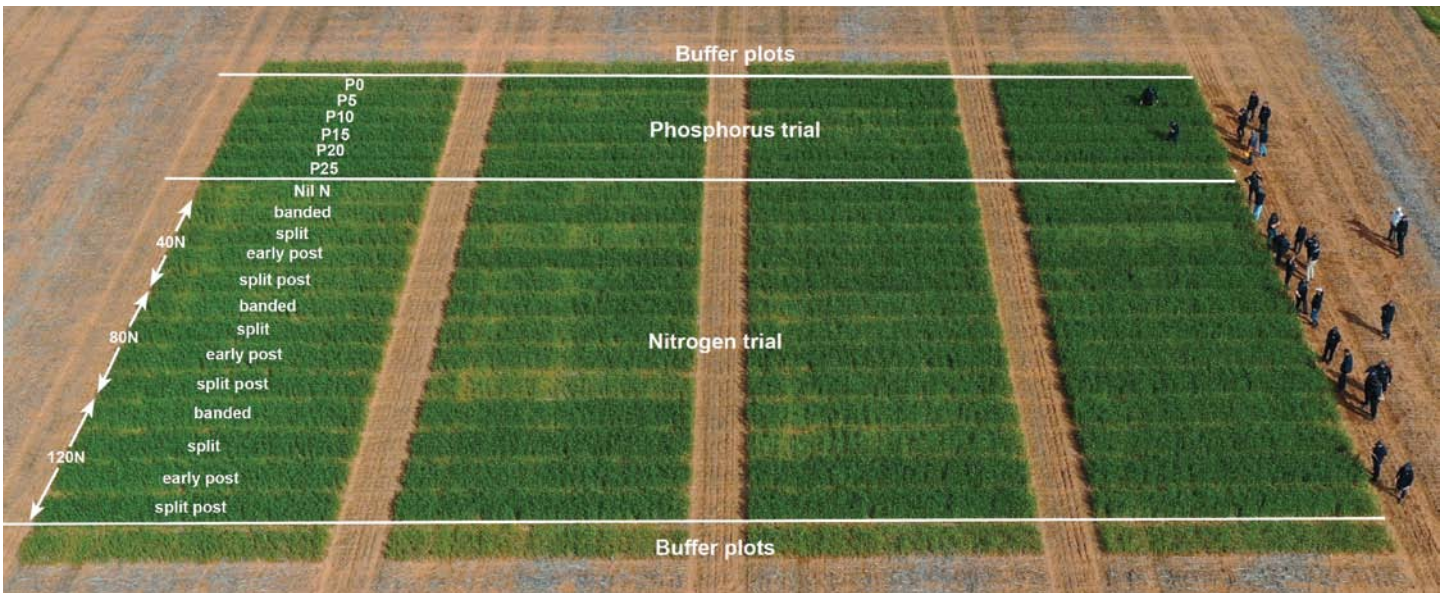
The main objective for these trials was to determine how to optimise Nitrogen (N) and Phosphorus (P) in a high input cost season, where budget considerations were a major contributing factor in fertilizer decisions, as opposed to maximising production. Conditions were excellent throughout the season, with growing season rainfall at the site 74mm above the 30-year average.

Regans Ford N strategies trial

The N strategies trial included rates of nil, 40, 80 and 120 kg/N ha. Each N rate had four different N timing strategies:

- All N applied at seeding.
- N applied in split applications – 50% at seeding and 50% at the mid-late tillering stage.
- Early post - 7 kg/ha of N at seeding with the remainder applied at the 2 to 4 leaf stage.
- Split Post - 7 kg/ha of N at seeding with 50% of the remaining N applied at the 2 to 4 leaf stage and the remainder applied at the mid to late tillering stage.

Some of the Summit team (below) inspect the Regans Ford Trial Site in mid-August 2022.



cost season

Brett Beard, Summit Fertilizers Area Manager, Moora, had an N strategy trial and a P rate trial at the Regans Ford WMG trial site in 2022. For more information on these trials, growers can contact Brett on 0429 900 607.

N results

Trial yields ranged from 3.06 t/ha where no N was applied, up to 4.81 t/ha where 120 kg N/ha was applied at seeding.

The N strategies trial at Regans Ford showed a clear trend that higher N rates resulted in higher yields.

At the 40 and 80 kg N/ha rates, the early-post strategy outperformed the seeding strategy, with yield differences of 0.46 and 0.45 t/ha respectively.

At the highest N rate of 120 kg N/ha however, this reversed with the 'at seeding' strategy performing slightly better than the early post strategy.

At the highest N rate of 120 kg/ha there was less variation in yields between the timing strategies.

Grain protein levels increased with increasing N rates and ranged from 8.9% up to 10.1%. The highest grade in the trial was APW2, which was achieved at the 120kg N/ha split and early post treatments.

Gross margins increased with increasing N rates. The 120 kg N/ha early post treatment had the highest gross margin of $1,210/ha, which was 44% above the nil rate (control).

In terms of timings, the early post strategy had the highest average gross margin of $1,059/ha, with the seeding strategy having the lowest at $913/ha.

Regans Ford P strategies trial

Alongside the N rates and timing trial at Regans Ford was the Summit phosphorus (P) rates trial.

This trial had P rates that ranged from 0 up to 25 kg P/ha.

P results

Yields ranged from 2.91 t/ha where no P was applied, up to a high of 4.95 t/ha at the highest rate of 25 kg P/ha.

There was a clear, significant trend showing yield increasing with increasing rates of P ($p<0.05$).

The yield response curve suggests yield increases to P were beginning to plateau around the highest rate of 25 kg P/ha.

Protein levels increased with increasing rates of P up to 20 kg P/ha, before falling at 25 kg P/ha.

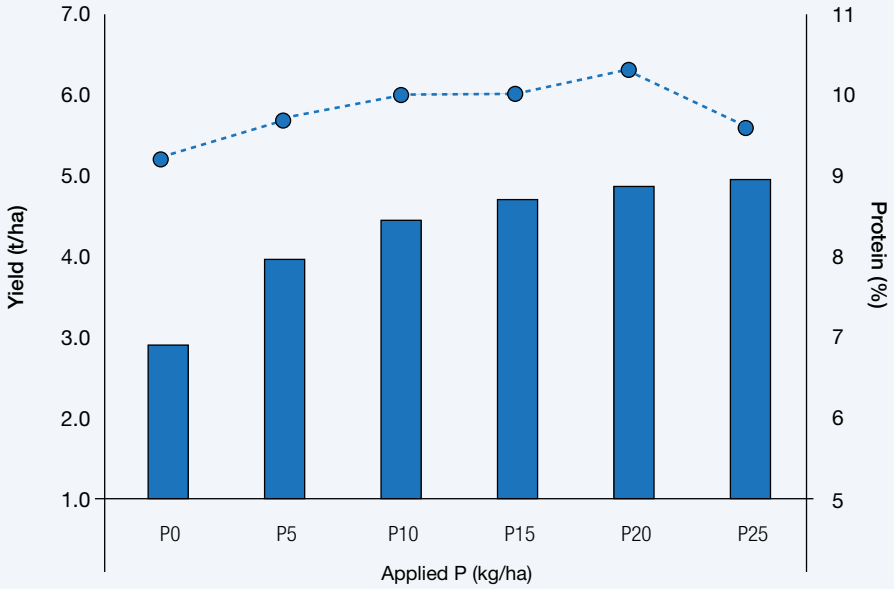


Figure 9. Calibre wheat harvest yield (bars) and grain protein (dots) with increasing rates of P. Gross margins also increased with increasing P rates up to 20 kg P/ha. The highest gross margin achieved was $1,227/ha (20 kg P/ha). It should be noted that all treatments resulted in substantial increases in the gross margin additional to the 0 kg P/ha control, ranging from a $556/ha increase at 5 kg P/ha up to a $969/ha increase at 20 kg P/ha.

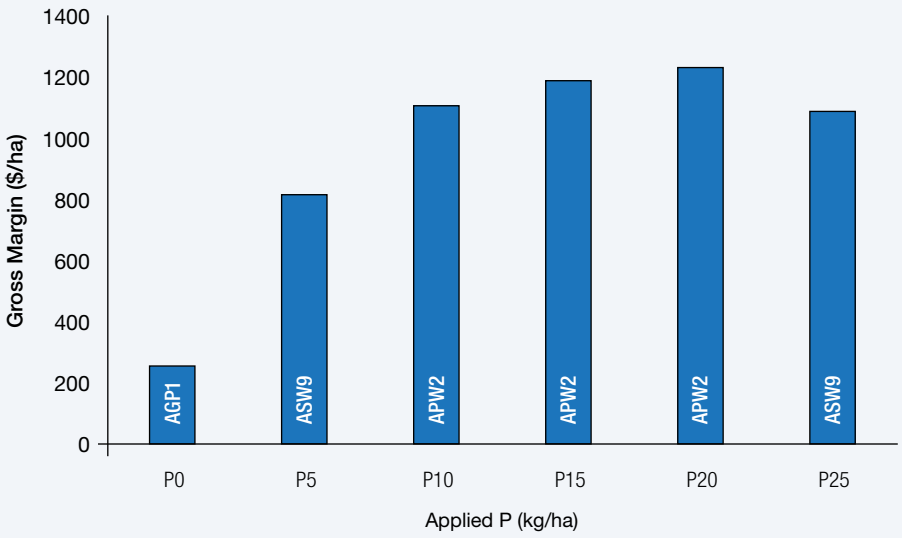


Figure 10. Gross margins and grain gradings across the different treatments.

Year three of Brett's long-term Badgingarra K trial

This trial started in Brett Beard's Moora area in 2020 with the aim of investigating muriate of potash (MOP) and sulphate of potash (SOP) placed with or below the seed at different rates ranging from 0 to 75 kg/ha of potassium (K).

There are 18 treatments in total. Each plot in the trial has received the same application every year, creating a compounding effect over time. The rates used are designed to run-down, maintain or build soil K reserves over time.

Brett's trial is designed to follow the host grower's paddock rotation over multiple years, and for the 2022 season was sown to Jurien lupins.

The Badgingarra site has a low clay and high sand content.

Results

Some interesting plant emergence observations were made in June 2022, with SOP showing to be a much safer K option for lupins, especially when banded with the seed at higher rates.

Where MOP was applied, the average emergence count was just 25 plants/m^2, while the emergence was 34 plants/m^2 when SOP had been applied.

The average yield across the trial was 3.37 t/ha and despite the variable establishment, yields were relatively consistent across K rates and placement.

Where no fertilizer was applied, the yield was just 1.39 t/ha. The next lowest yield was 3.03 t/ha where 45 kg K/ha of MOP was banded below the seed.

The highest yield was 3.74 t/ha when no K was applied (basal fertilizer rates applied to all plots were 7 kg N/ha, 14 kg P/ha, 8 kg S/ha), followed by a 3.69 t/ha yield when 75 kg K/ha was banded below the seed as SOP.

As there was no yield response to K, the most profitable treatment under 2022 conditions was when no K was applied, with an indicative gross margin of $956/ha.

This trial will continue into 2023, where it will be interesting to observe any possible redistribution of K in the profile from the lupin crop.

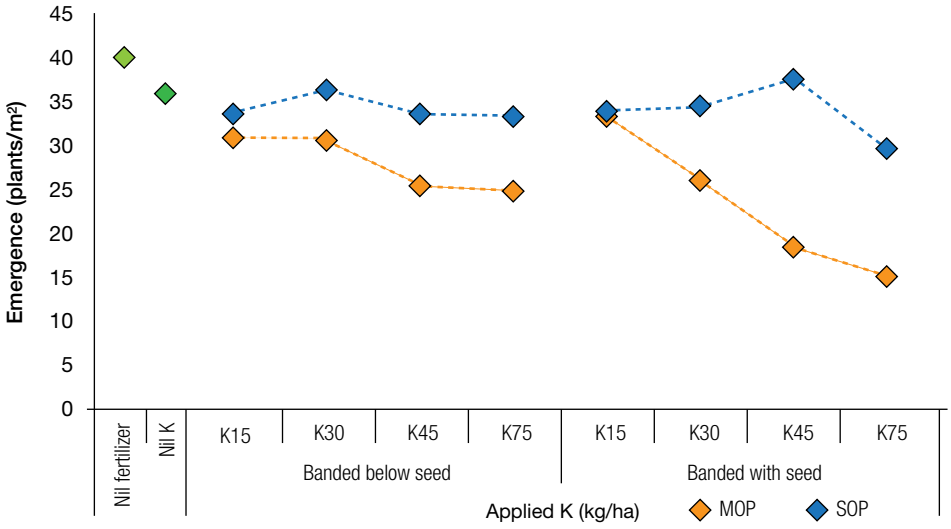


Figure 11. Plant emergence counts demonstrate MOP had a negative impact on lupin plant establishment, when it was banded with the seed and as rates increased.

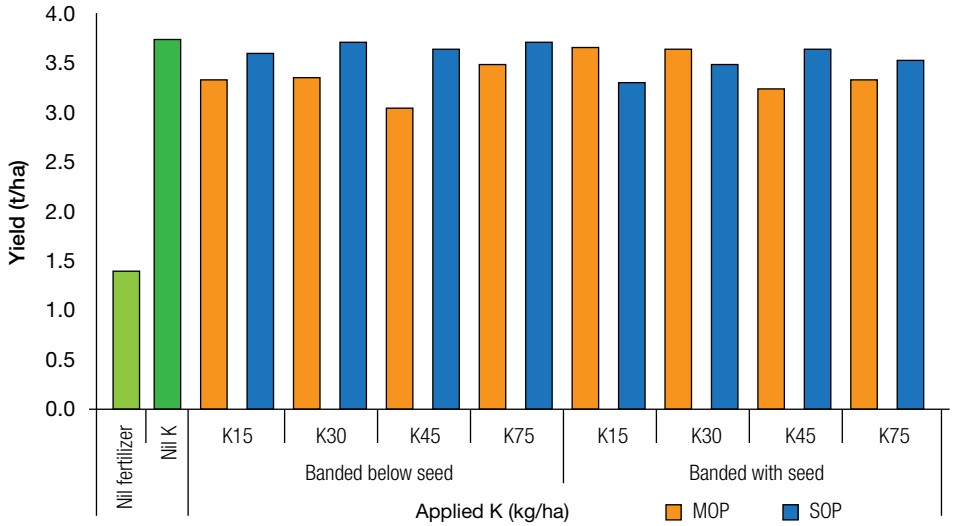


Figure 12. Individual treatment harvest yield results demonstrated relatively consistent yields across K rates and strategies, and a markedly lower yield when no fertilizer was applied.

Summit Fertilizers can supply high quality muriate of potash (containing chloride), pictured above, and sulphate of potash (containing sulphate).

High yielding N and P requirements +/- compost

Last season Brayden Noble, Summit Fertilizers Area Manager, Northam, had this N and P trial at The Lakes, and a trial on residual N levels after canola (featured on the next page). For more information, growers can contact Brayden on 0417 490 047.

The aim of Brayden Noble's trial at The Lakes (just east of Mundaring) in 2022 was to investigate the interaction between high nitrogen (N) and phosphorus (P) rates in a high rainfall environment. The trial was conducted on forest gravel soil representative of the area.

Being near a facility that processes organic household waste into compost, Brayden's chosen site presented a unique trial opportunity. The final composted product is designed to be spread across cropping land.

An assessment of the impact of added compost was incorporated into the trial, to gauge it's potential to be complementary, or even replace some traditional fertilizer sources. An economical analysis, with freight considerations was also calculated.

P rates ranged from 0 to 40 kg/ha and N from 0 to 280 kg/ha. Where compost was applied, the rate was 5 t/ha. In total there were 30 treatments. The hybrid canola variety 45Y28RR was sown on May 9th at 4 kg/ha. The Lakes had a decile 9 growing season rainfall of 700mm.

Results

Yields in this trial varied greatly with fertilizer inputs, ranging from as low as 1.8 t/ha when no P, N or compost was applied and up to a high of 3.8 t/ha when 40 kg P/ha and 280 kg N/ha was applied without compost.

Yields increased with P up to 40 kg P/ha and with N up to 140 kg N/ha, both with and without compost.

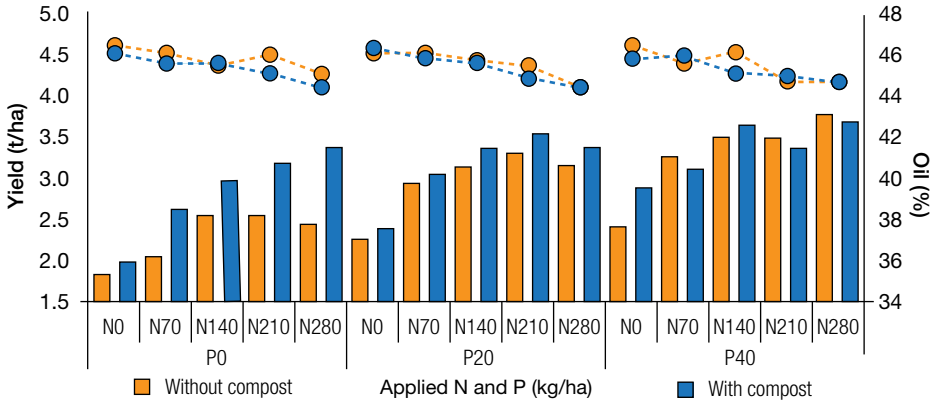


Figure 3. Individual treatment canola yields (bars) and oil content (dots) show how yields and oil content vary with different rates of N and P, with and without compost.

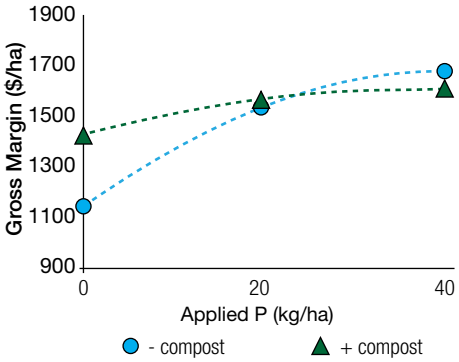


Figure 14. Gross margin responses to applied P, with and without compost .

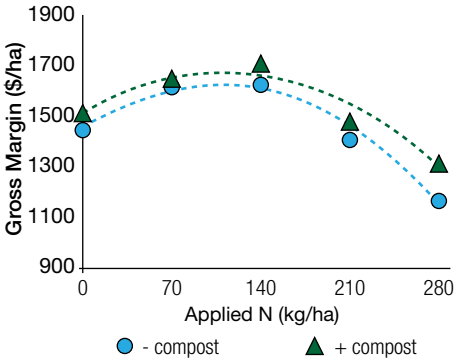


Figure 15. Gross margin responses to applied N, with and without compost.

The application of compost improved yields greatly when no granular P fertilizer was applied and to a lesser extent when 20 kg P/ha was applied. Where 40 kg P/ha was applied the canola plants evidently had sufficient P from granular fertilizer as there was no yield response from applying the compost.

Oil decreased with N rates, P rates and with the application of compost, demonstrating an inverse relationship with yields.

The highest returning individual treatment was when 40 kg P/ha and 70 kg N/ha was applied without compost. This application had an indicative gross margin of $1910/ha, which was $610/ha more than the nil control.

Where no P was applied, the compost material resulted in considerably higher profits, however this reversed at the highest P rate of 40 kg/ha, where it proved un-economical to apply the compost additional to granular fertilizer, as there was no yield benefit.

As compost is applied in such large quantities, freight would pose a considerable logistical challenge, with costs incurred.

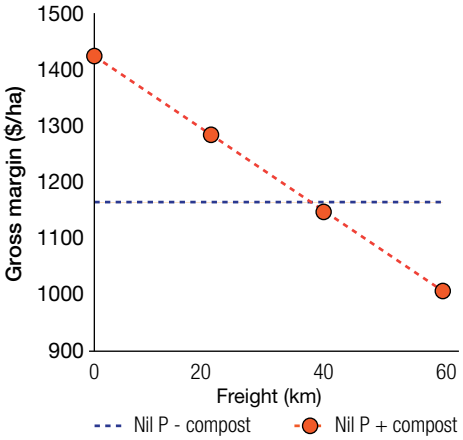


Fig 16. Average gross margins when no granular P was applied factoring in costs for freighting the compost product.

Using a typical freight rate of $7/km the indicative gross margins were compared where no granular P fertilizer was applied, factoring only freight of the compost product. Calculations showed compost remained profitable at distances just under 40km from where it was sourced.

Residual N tested after high yielding canola

In 2021 Summit Area Manager, Northam, Brayden Noble, applied high nitrogen (N) rates in a Goomalling hybrid canola trial to really test yield potential.

While a N response was observed up to 160 kg N/ha in that season, it was relatively minor and not great enough to say that increasing N rates had a significant influence on canola yields.

The same trial site provided an ideal opportunity in 2022 for follow-up residual N work.

Summit ran a trial over the same plots to see if there was any residual N left over that would be available to the following wheat crop in 2022.

To test this, last year's plots were remarked and dry sown on May 6th with 90 kg/ha of Scepter wheat.

A basal fertilizer rate of 20 kg N/ha, 9 kg P/ha, 9 kg K/ha, 6 kg sulphur/ha, plus copper and zinc was applied across all plots, as per farmer practice.

2022 results

Decile 8 rainfall in the 2022 growing season at the Goomalling area resulted in a high average yield across the trial of 4.5 t/ha.

Yields ranged from 4.2 t/ha when no N was applied in 2021, up to an average of 4.5 t/ha in all treatments that received at least 120 kg N/ha in 2021. There was a minor yield response from nil to 120 kg N/ha, suggesting that there may have been a slight carryover effect from 2021 applications. However, this response was relatively minor and not great enough to deem the trend to be statistically significant.

Grain protein varied from 7.6% up to 8.3%, and was higher when at least 120 kg N/ha had been applied in 2021. Grain protein increased marginally with N rates from 120 kg N/ha up to 200 kg N/ha. As grain protein failed to exceed 9%, all treatments had a receival grade of ASW1 ($340/t).

All treatments received the same fertilizer applications in 2022, meaning inputs costs were the same and gross margins were reflective of trends in yield. Combining 2021 indicative gross margins with grain value from 2022 suggests that 2021 N applications between 40 and 120 kg N/ha were the most profitable over the two seasons, exceeding profits from the nil N control by close to $300/ha (see figure below).

As N rates increased beyond 120 kg/ha, profitability begun to decrease.

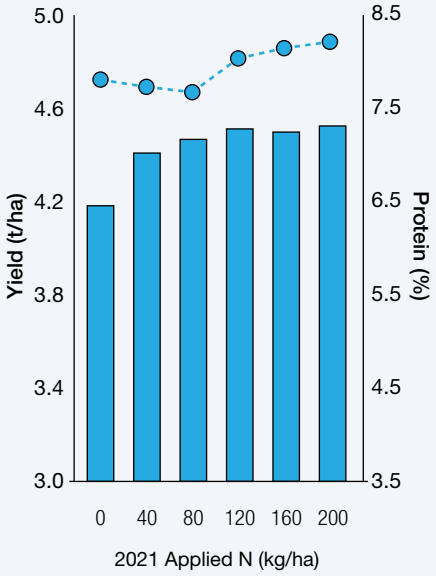


Figure 17. 2022 wheat yield (bars) and grain protein (dots). Note: N rates shown are for the 2021 applications. All plots in the 2022 trial received the same N rate (20 kg N/ha).

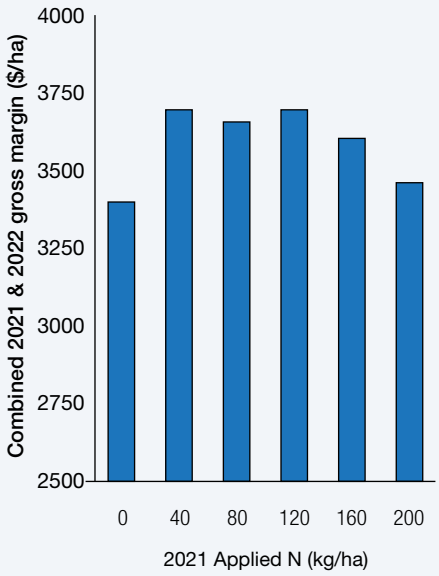


Figure 18. Combined 2021 and 2022 gross margins demonstrated highest combined profits where 40-120 kg N/ha was applied in 2021.

Update on Tim

Summit Esperance Area Managers, Tim Donkin (West) and Nick Donkin (East) started long-term phosphorus (P) and nitrogen (N) trials in their region in 2021. Their aim was to assess the cumulative long-term effect of applied P and K fertilizer and cropping rotation in building, maintaining, and drawing down soil P and K levels.

Since then, each plot in the trials have received the same fertilizer application each year, to create a compounding effect over the seasons.

For 2022 (year 2), both trials were sown to Scepter wheat, following on from canola in 2021.

- For the P rate trial, there are 6 treatments ranging from 0 to 30 kg P/ha.
- For the K rate trial, SOP was used as the K source, with 5 treatments ranging from 0 to 60 kg K/ha.

Last years growing season rainfall for the area was decile 6, with well above average rainfall for October and November.

Soil test results

Soil tests taken on March 11th 2022, showed the nil P treatment had the lowest soil P at most depths and was lower than the initial 2021 test results. This highlighted that applying no P resulted in soil P rundown.

In the top 10 cm, 9 kg and 30 kg P/ha were effectively the same as the 2021 results, suggesting these rates were suitable for maintaining soil P levels. 18 kg P/ha was higher than any other 2021 treatment in the top 10cm, but then merged with the rest of the treatments at lower depths where there were marginal differences between treatments.

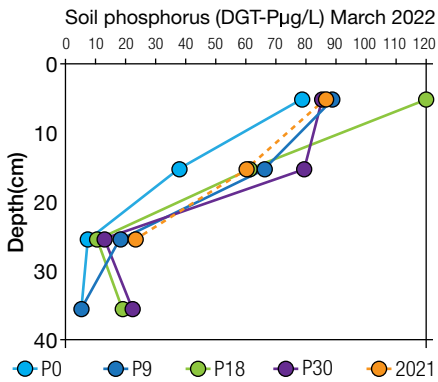


Figure 19. DGT-P soil test results for samples taken on March 11th at different depths.

and Nick's long-term P and K trials

The long term Dalyup trial site, image taken late August 2022. For more information on these trials, growers can contact Nick Donkin on 0428 715 045 or Tim Donkin on 0408 092 355.

In the top 10 cm, testing showed nil and 15 kg K/ha treatments had lower soil K than prior to 2021's canola crop.

In contrast, 30 and 60 kg K/ha had higher soil K after high-yielding canola compared to 2021 soil test results. This suggests that rates under 30 kg K/ha run-down the soil K reserves and rates above 30 kg K/ha build up soil K.

At depths below 10 cm, results showed increased soil K compared with 2021 test results, regardless of 2021 applied K. This indicated the deep-rooted canola crop was able to re-distribute K from the deeper soil layers to higher in the profile over the season.

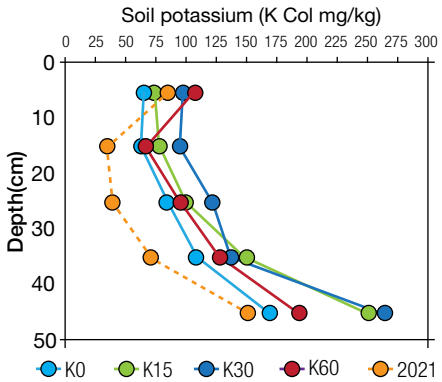


Figure 20. Colwell K soil test results for samples taken March 11th at different depths.

2022 results – long term P trial

Scepter wheat yields ranged from a high of 5.4 t/ha at the top rate of 30 kg P/ha down to 3.8 t/ha where no P was applied. There was a significant trend demonstrating that higher P rates resulted in higher yields ($p<0.05$).

Protein levels remained relatively consistent, with 24 kg P/ha the only treatment that was graded APW1.

The highest gross margin was $1552/ha when 30 kg P/ha was applied and the lowest was $1037/ha at 0 kg P/ha. When P was applied (9 to 30 kg P/ha) there was limited variation in gross margins which ranged from $1552 – $1519/ha.

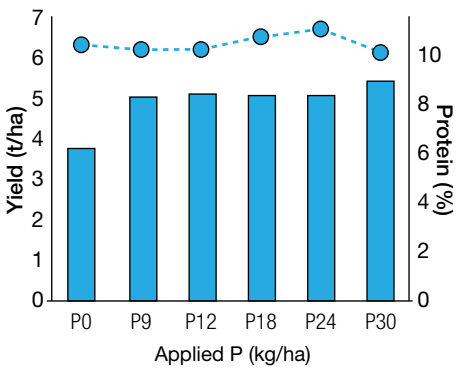


Figure 21. Scepter wheat yields (bars) and grain protein (dots) with increasing rates of P.

2022 Results – long term K trial

The yield average across all treatments in the K trial was 5.5 t/ha. This trial was unresponsive to K, which was expected given the high soil Colwell K levels identified during Summit inSITE soil testing.

Grain protein levels were relatively consistent across all treatments.

Gross margins decreased with increasing K rate. The highest gross margin was $1707/ha at 0 kg K/ha and the lowest gross margin was $1521/ha at the highest rate of 60 kg K/ha.

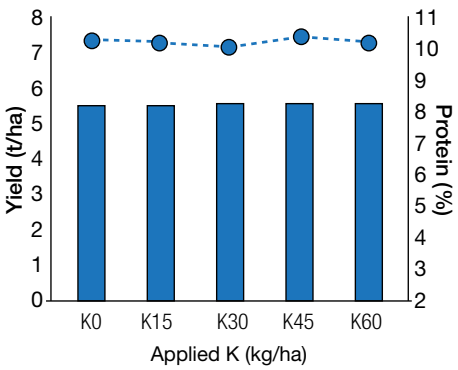


Figure 22. Scepter wheat yields (bars) and grain protein (dots) with increasing rates of K.

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