Spring 2017

Fertilizer News

Dry conditions and decreased crop yields – key nutrient decisions for next season

In many parts of the Wheatbelt this year, a late break and little winter rainfall until late July resulted in crops that really struggled. The logical question is, what does this mean for nutrients that were applied in fertilizer to failed or very low yielding 2017 crops? Will these nutrients be available to crops in 2018 and what would that mean for fertiliser decisions?

Here are five important points to consider. They come from Summit's extensive array of field trial data that extends over many years.

Starter P for target yield

Phosphorus (P) is an immobile nutrient in many soils. It's removed by plant uptake, then through grain harvest or hay cutting and grazing. Add to that a portion that will become so well-fixed to the soil that plant availability will be almost nil. This is partly dependent on soil composition but pH can also have an influence.

The answer to how much P will be available next season is not simple. A portion will be readily available, a portion will be more difficult for plants to access and may be considered unavailable to the next crop.

What is well known is availability of applied P decreases over time. This is part of the reason P is placed directly in the path of growing roots at each seeding. In long-term Summit trials at Yealering and Holt Rock, P between 0 and 30 kg/ha was applied annually for four years. Withholding P in the fifth year decreased grain yield in all plots compared to continued seeding P application, regardless of rate (Figure 1).

(continued on next page)

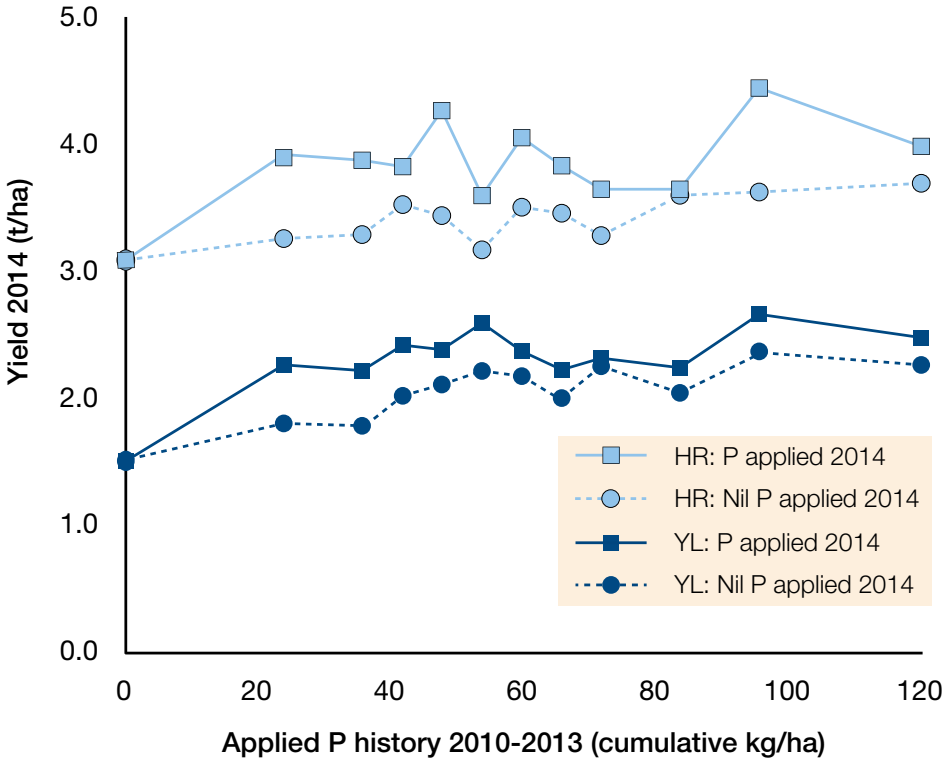

Figure 1. Neglecting P in a single year, even after high annual applications over four years, resulted in yield decreases at Holt Rock (HR) and Yealering (YL) long-term P trials in 2014.

In this issue!

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Key nutrient decisions (cont.)

Eight years of factorial N x P trials in the eastern wheat belt has demonstrated the value of applying P. Significant yield responses have been common, even where soil tests show Colwell P levels above indicators for minimal response (Figure 2).

These yield responses overwhelmingly result in positive gain in returns. Even in lower yielding seasons, margin impacts are mostly neutral, rarely negative, and yield response show the same pattern, but total gain is limited by other factors.

The key message from these trials is that in spite of yearly growing season variations, for a harvestable crop, fertilizing with a P rate of 3 to 4 kg/ha for each tonne of grain yield being targeted consistently produces the greatest yields and returns, and can also support higher yields when seasons are favourable.

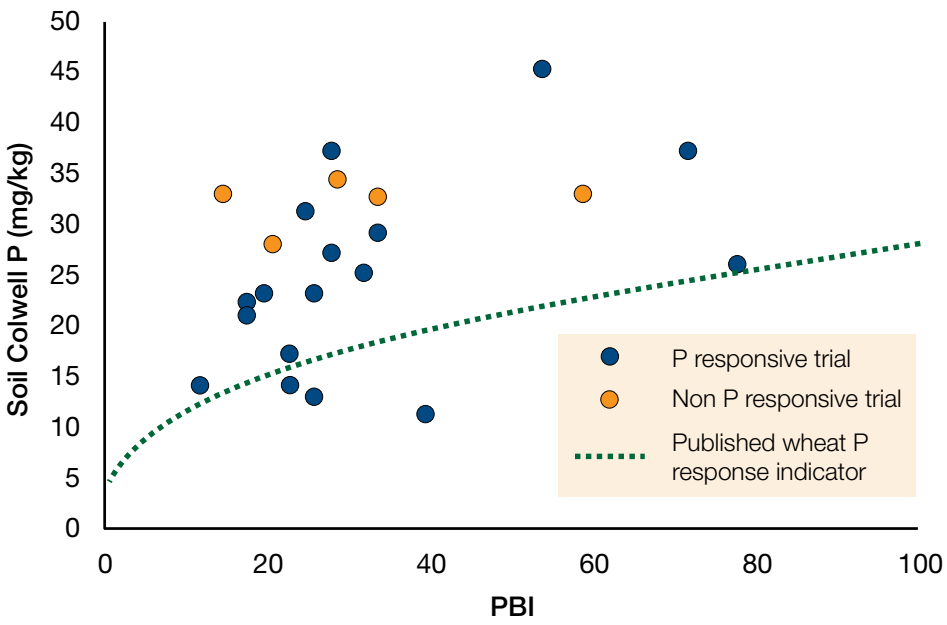

Figure 2. Summit's N x P rate field trials in the eastern wheatbelt 2012-2016 were overwhelmingly responsive to P, even when soil tests showed P levels higher than published critical indicator of P response (Moody 2007, Aust J Soil Res, Vol 45, 55-62).

Nitrogen, early or late?

Timing of N applications has production and risk ramifications. It is not simple, with soil type, sowing time, season and weather variations all having an impact.

High rates of nutrient salts close to seed can impact germination. Some can also move freely away from the root zone with water flow. Conversely, in dry conditions nutrients remain unavailable and, essentially, become a cost. Applying a crop's entire N requirement up-front may not be sensible or feasible.

Mineralization of N can happen when it rains. However, this N must come from sources related to the organic carbon in the soil. Continuous cropping will cause a gradual run-down of organic carbon levels, almost without exception in WA soils. Soil sampling now shows major tracts of cropping land with organic carbon below 0.5%, so mineralization of N is often not even close to crop requirements.

Summit field trials reveal that cereal crops that received a reasonable dose of N at establishment are not exposed to N-limiting conditions during early growth. Comparatively, those receiving little or no N at seeding start to lose yield potential quickly and require larger in-season N inputs to maximise yields.

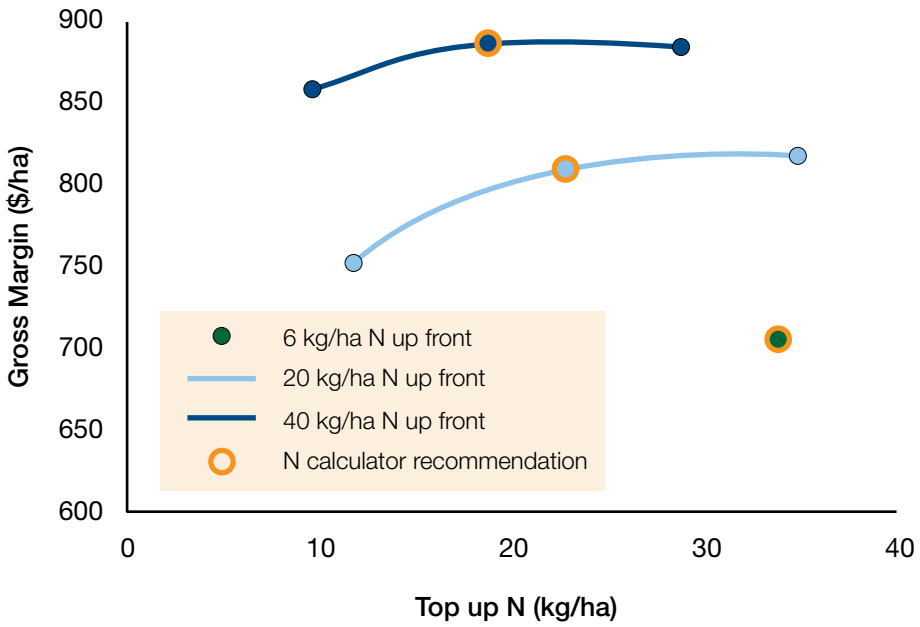

Figure 3. Nitrogen applied up front removed N as an early limit to wheat yield potential, decreased crop requirement for in-season N and improved returns, Binnu 2016.

They may never reach the productivity or returns of crop with early N (Figure 3).

A split N application strategy allows flexibility, but be mindful that access to adequate N early generates the tillers that set up yield potential. Rates of 20 to 40kg N/ha at seeding are generally a good start. An effective way of managing N from there is in combination with an N-rich strip which, if and when it starts to appear as a visible colour and crop biomass difference, indicates an N limitation is beginning to emerge. Summit's in-season N calculator can then help determine the optimal N rate for the crop.

Influence of P on cost-effectiveness of N

One of the most significant outcomes of our continuing factorial N x P trial series has been the overwhelming evidence that crops lacking in adequate P supply show impaired ability to respond to N applications (Figure 4).

A key role of P in plants is within the molecules needed for energy transfer. Limited P means limited ability to store and transport energy which fuels all growth processes. So, no matter how much N is applied and taken up by the plant intended for use in photosynthesis and protein generation, without the P-mediated energy transfer this N (and the dollars used to purchase it) will never be fully efficient.

Importantly, there is little chance to adequately rectify a P limiting situation after establishment. So P supply for your crop needs to be set up at seeding.

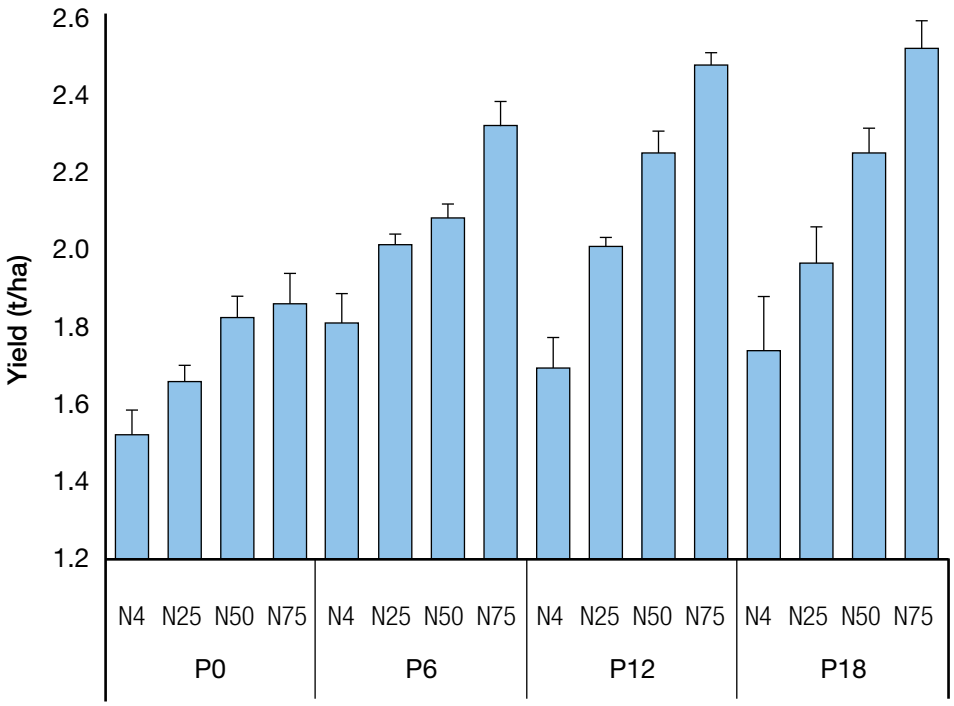

Figure 4. Wheat at Ballidu 2015 showing a significantly greater ability to respond to N applications when P is in adequate supply from fertiliser banded below the seed.

Blends versus compounds

While the Summit research team's focus is to ensure that field trials investigate fundamental nutrition and soil-plant fertility principles, products used to supply the nutrients occasionally stand out. A good example is Vigour.

Summit introduced a reformulated Vigour back into the range. With MOP-based K, N and P in a fully compounded granule, Vigour's performance in demonstration plots aligned with nutrient rate trials using MAP+MOP, MAPSZC+MOP and DAPSZC+MOP blends has been outstanding (see photo right) and is worthy of consideration if K is part of your soil fertility requirements.

Calingiri 2017 trial showing performance of Vigour (left 5P+5K/ha) equal or better than MAPSZC+MOP blend with higher K (right 5P+20K/ha).

For 2018, start with soil tests

Soil testing can identify areas where nutrients in the root uptake zone are limiting. They can also provide insight if nutrients are accumulating. Armed with response data from local and robust field trials, when growers combine this soil information with crop rotation, historic management, yields, site and environmental conditions, fertilizer can be adjusted to more closely reflect required rates and strategies for productivity targets. Repeated tests over time are also powerful to gauge trends in relation to paddock practice.

Soil tests can also identify other constraints, such as acidity, or inherent soil conditions such as nutrient exchange capacity or potential strength and speed of binding nutrients in forms unavailable to plants. These are important factors that will regulate the supply of nutrients to the roots from both the soil itself and any applied fertilizer.

Soil testing can be used for prediction, monitoring or diagnosis. It may not provide all the answers, but if you don't test, you definitely don't know.

Summit prepay and credit options

Summit prepay options

- BPAY – using the BPAY system with your bank, you can send funds directly to your Summit Fertilizers account.
- EFT – Transfer funds from your nominated account to Summit Fertilizers.
- Easy Pay – Summit Fertilizers Direct Debit the amount of the order in the month prior to collection.

Summit credit options*

- FASTPAY – 4 Day Collect & Pay option. For example, collect product on Monday, invoices forwarded on Tuesday and the exact amount direct debited on Thursday. Simple and efficient method for those growers that collect multiple loads on a weekly basis.
- PAY25 – Our Summit version of a 30-day account. Collect your product all month long and invoices are forwarded at the end of the month, along with your direct debit advice. On the 25th day of the next month, the nominated account is direct debited the exact amount of your previous month's collections.
- Deferred Harvest Terms – Collect your seasonal requirements; receive your invoices and statements each month along the way. Your nominated account will be direct debited on the 25th of January at the start of the new season. This option can have the payment due date tailored to coincide with cattle and/or sheep sales. Growers should contact our Credit Manager, Cheri Bowater, on 9439 8903 to discuss this option.
- Agent Finance -subject to agent approval. Agent terms and conditions apply.

Summit Credit Manager, Cheri Bowater

All of your Summit transactions can be viewed on Summit Connect. Ask your Area Manager for further information or contact our Credit Manager, Cheri Bowater on: 9439 8903 for more details.

*Terms and conditions apply, subject to Summit's approval.

Customer focus at Summit

Ease of doing business with Summit is something we prize highly!

Our despatch facilities located in Kwinana, Bunbury, Esperance, Albany and Geraldton are maintained to the highest standards, which enables us to deliver quality products with maximum efficiency.

We manufacture MaxamFLO and UAN from the Kwinana, Geraldton and Esperance locations and have flexible opening times across all depots when seasonal and customer demand is at its highest.

All five facilities have the ability to custom formulate to suit grower requirements.

A common blend is MAPSZC and MOP, which allows growers to alter the K rate, while continuing to supply a balanced NPS fertilizer with trace elements.

Fungicides like flutriafol can be applied to fertilizers at all five depots. And Summit fertilizers has a number of payment options for fertilizer transactions.

Growers should contact their Area Manager for more details.

Fuel Gauges prove their value in a dry season

This season, in drier parts of the Wheatbelt, the decision on whether or not to apply additional post-emergent nitrogen was complicated by the dry winter and a general lack of confidence in rainfall for the season going forward. Summit Fuel Gauges put down at seeding showed that in most cases a nitrogen top-up was not required as moisture was limiting crop growth, not nitrogen.

This 'no nitrogen' recommendation was a valuable outcome of having a Fuel Gauge installed.

In many areas the late July to September rainfall was better than average. Any established crops benefited greatly from these conditions. However, in many cases our Fuel Gauges have shown that these crops were being limited in late growth due to a lack of nitrogen (as these crops did not receive any top up N due to the dry winter).

This outcome has instigated discussions on nitrogen timing.

In hindsight, additional nitrogen applied to the crop at seeding would have been beneficial in this season - another valuable outcome from Fuel Gauges.

Putting more nitrogen up front means an in season decision on nitrogen is less critical. Many growers limit nitrogen application at seeding to minimise risk, however as shown this year making post emergent nitrogen decisions was difficult, particularly with adverse seasonal conditions.

Previous Summit trial work at Binnu in 2015 (see Figure 3) showed just how important timing is. Delaying decisions on nitrogen top up, with the intention of decreasing the risk of over application and not gaining returns with a sharp finish was false economy.

Other trial work has shown that unless crops are grown on light soils that are subject to leaching, the nitrogen applied in a dry year is available in the next season.

Summit Fuel Gauges are a valuable in-season tool for making nitrogen decisions. This year they have shown their value in a dry year as they can instigate discussions on overall nitrogen strategies.

Collaborative field trials are a real strength of the Summit business

With the onset of late and for many farmers - season saving rain, the Field Research team has been busy with the 2017 field trial program. There's been lots to do, including the application of top-up treatments and collecting growth and nutrient uptake data. It's been pleasing to see so many growers have taken the opportunity to visit our trials at local spring field days and paddock walks.

Our own staff too (pictured above) gain valuable information from these trials as they display trends and best nutrition practices for local regions. This extensive Summit trial program is done in collaboration with other businesses and consultants and is important as farming methods evolve.

Special thanks must go out to all our cooperating growers who are hosting trials on their properties this season. Having sites that not only represent the local area but are also well looked after with minimal disturbance means the quality of the information they provide is particularly valuable.

Grower trials provide real-time comparisons under local conditions. If growers are interested in hosting a trial, they should get in touch with their local Area Manager.

SummitConnect update

Recently, SummitConnect was updated to make the platform more usable and flexible for customers.

Getting setup on SummitConnect is now even easier and quicker. A simple email to:

summitconnect@summitfertz.com.au

will get a login and password. You can change these once you have logged in. One of the improvements is the ability for customers to be able to change their trading details on line, with a simple form. Details such as mailing address, phone number and other contact details can be quickly updated.

For security reasons, details such as bank accounts and ABN's cannot be updated using the online form.

If you want to know more about getting the best from SummitConnect, talk to your Summit Area Manager.

Welcome Renae

Renae Parsons joined the Summit team at the start of August as Customer Service Officer, based in the Albany Depot. From a family farming background in Tenteden, a Diploma in Aquaculture and on farm roles in both Mt Barker and Manypeaks, Renae has a wide range of agricultural knowledge. When she is not working, Renae can be found on the hockey field.

Soil amelioration, nitrogen & phosph

Collaborative research is an umbrella term Summit uses for procedures that actively engage rural communities - from farmers through to researchers, during the investigation process from start to finish.

It's where researchers, community-based organisations and individuals work together to:

- identify the problems to be tackled and the questions that need to be answered;
- undertake the research and interpret the results in terms of their significance; and
- spread the research findings more widely to encourage change.

Summit has collaborative research trials right across the State and the relationship with Warakirri Farming is a good example of the benefits that come from this approach.

Warakirri Farming is undertaking significant steps to remove soil constraints that have in the past significantly impacted on plant growth. They are tackling soil compaction and soil acidity with deep ripping and liming in a bid to significantly lift crop production.

These activities are ongoing and raise questions in terms of how they set new benchmarks for the requirement of crops to varied nutrition regimes following these operations

Research in this area is rare and assessment of yield and potential returns has not been widely investigated when such a system is pushed with high rates of fertilizer application.

In collaboration with Warakirri Farming, Summit Fertilizers has instigated a number of cropping trials to test the crop response, mainly to phosphorus rates applied at seeding and nitrogen rates split through the season.

Warakirri Farming's Mawarra farm at South Burracoppin provided an ideal site to research the value of investigating the nutrition package to accompany these soil amelioration activities.

Trial background

A significantly compacted yellow sand paddock was limed and deep ripped in 2016 prior to being sown to canola. In 2017, Summit established a factorial nitrogen (N) and phosphorus (P) trial at the site, including some relatively high rates to test the productive capacity of the paddock under wheat.

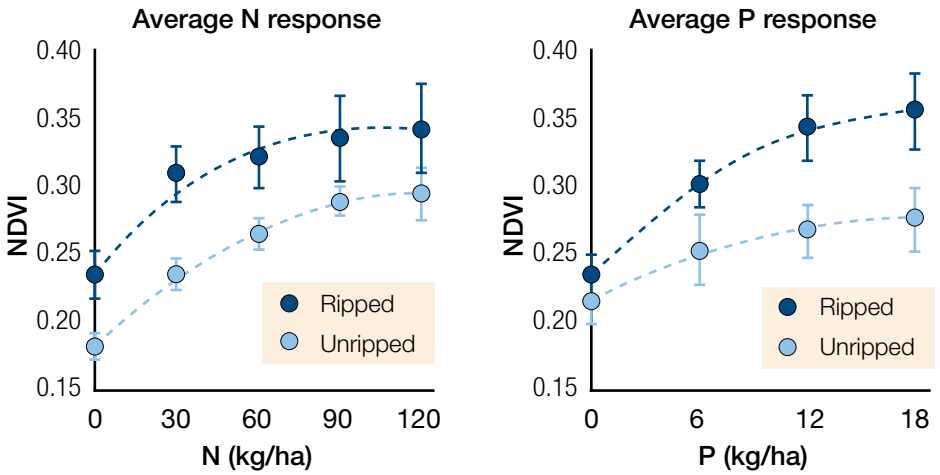

Figure 5. Biomass assessment by Greenseeker (grouped treatment means, 22/8/17) indicates strong crop growth responses achievable with increasing N and P and a strong nutrient x ripping interaction.

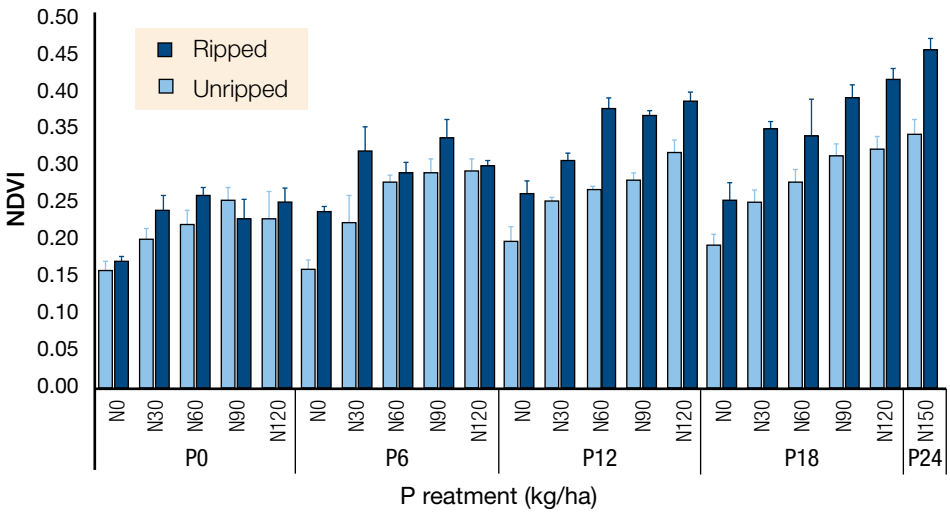

Figure 6. Individual treatment NDVI demonstrates an increasing ability for the wheat crop to respond to N where adequate P is applied at seeding.

Plant samples from a limed + ripped (left) and unr
Plant tissue sampling (whole tops) reinforced how
of lime and ripping in decreasing soil constraints is

horus combine for maximum yield

Season data to date shows very interesting trends.

Biomass assessment by Greenseeker® (Figures 5 and 6) highlights the strong crop growth responses achieved with increasing N and P and a strong nutrient x ripping interaction.

Plant tissue sampling validated the spectral NDVI assessments.
A key point being that increasing N appears ineffective without adequate P (Figure 7). The impact of lime and ripping in decreasing soil constraints is particularly notable. Plant growth continued to increase up to 24 kg/ha of P on ameliorated soil and appears to support targeting increased growth potential by higher nutrient application. The economic value of this will be assessed by grain harvest and grain quality analysis.

Plant tissue nitrate analysis demonstrated N uptake occurring (Figure 8), but along with the plant growth data indicated poor ability to utilise this N when P supply was deficient. We are seeing this response in many of our trial plant tissue samples around the state. Notable is the significantly higher N in plants on ripped plots, suggesting restricted root growth decreases nutrient uptake even if luxury amounts are applied.

The fact that these results are being achieved in a dry year after a late break offers a lot of excitement to growers. It means they should be able to tailor nutrient rates to capture the most from their efforts to address soil constraints.

Certainly, Warakirri is keenly awaiting harvest data and, being Calingiri wheat, the capacity to capitalise on a price premium for noodle quality specifications provides an additional incentive to look closely at the N responses.

ipped replicate (right).
ineffective N was without adequate P. The impact
s particularly notable.

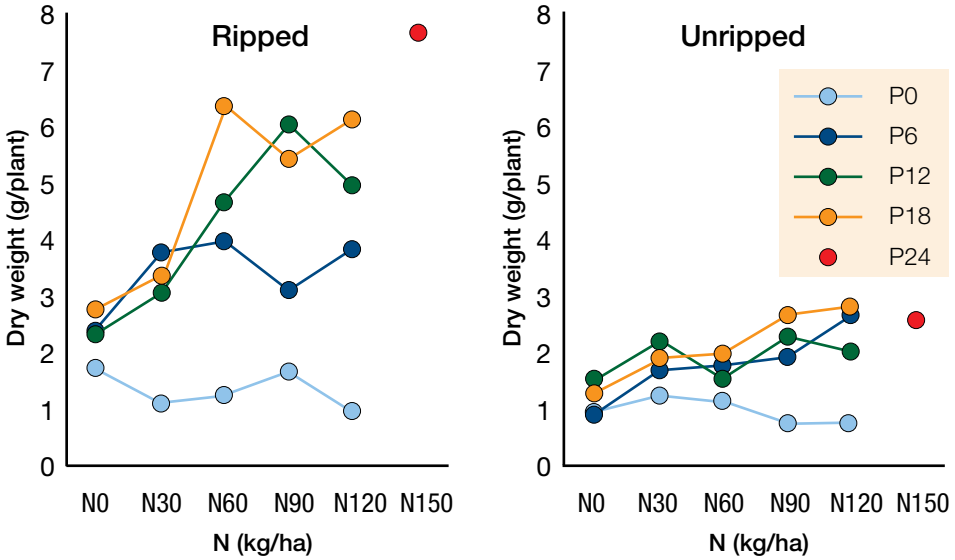

Figure 7. Plant tissue sampling (whole tops) validates the spectral NDVI assessments. Increasing N appears ineffective without adequate P. The impact of lime and ripping in decreasing soil constraints is particularly notable and appears to support achieving increased growth potential by higher nutrient application. Economics of this will be assessed by harvest and grain quality analysis.

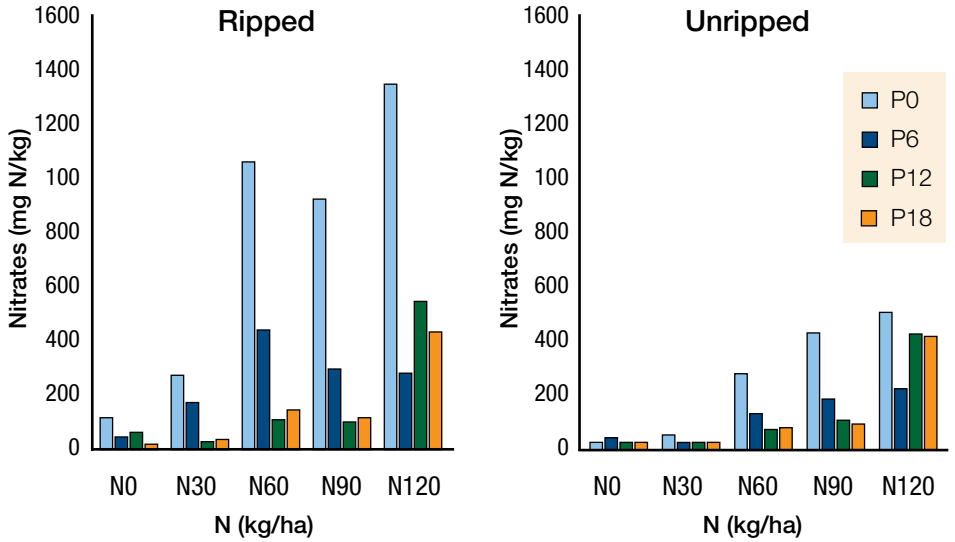

Figure 8. Plant tissue nitrate analysis demonstrates N uptake occurring but the plant growth data indicates variable ability to utilise this N when P supply is deficient. Notable is the significantly higher N in plants on ripped plots, suggesting restricted root growth decreases nutrient uptake even if luxury amounts are applied.

Summit rewarded for excellence at spring field days

Summit services

- Summit Fertilizers uses an independent laboratory for both soil and plant analysis, with interpretations based on WA research.
- Summit can coat fertilizer products with fungicide to help control disease in canola and cereals. Ask your Area Manager for more details
- Get over the phone or on the farm advice through Summit's own agronomists or our network of agents.
- Summit carry out a range of field trials every year.
- Custom formulations are a Summit specialty.

Stay connected!

SummitConnect is the convenient online option for farmers to:

☑ check orders
☑ download tax invoices
☑ see despatches for the season
☑ update customer details
☑ view and print statements

Now it's even quicker and easier to keep on top of your fertilizer business.

Summit Fertilizers has picked up another award for excellence in customer service and information. At this year's WA Machinery Field Days Summit was rewarded for excellence at Newdegate for the best marketing and financial display.

The judges awarded Summit top marks for both company presentation and information available to growers. It's an award reflective of the many years of support the Summit team has provided to rural communities and growers.

Newdegate saw large crowds pass through the marquee who were able to take advantage of the most up-to-date information and talk to Area Managers from across the southern regions.

Mingenew Expo and Dowerin Field Days were equally rewarding from a Summit perspective. They enabled direct dialogue with valued clients across the other regions, some of whom have experienced challenging conditions this season.

Mingenew Expo launched the start of the field days. Between welcomed showers, community spirits were high and the Summit Re-Boot competition brought a bright display of up-cycled work boots to the front of the marquee. With the season off to a slower than normal start in the region, the Mingenew Expo offered a great opportunity for the team of Area Managers and Senior Management to discuss the importance of Summit Technical Support.

Featured at this year's display was SummitQ. Showcasing the range of technical service offered by the company, SummitQ is all about increasing farm productivity. Field staff spent the field days discussing trial results, Fuel Gauges and the added advantage of SummitQ programs.

Dowerin Field Day brought sunshine and large crowds. A wide range of staff from sales, marketing, finance and field research provided clients with service knowledge and the opportunity to discuss the 2017/2018 market offer.

The latest in SummitConnect was on display inside the marquee. Customers were able to navigate through a real life example of the online customer service system.

They were among the first to see the latest updates, which include the ability to update personal details and add additional farming information specific to their enterprise. The changes will assist in making business transactions with Summit more personalised and easier.

SUMMIT
QUALITY TECHNICAL SERVICES

Hort blends hit the mark

When the WA Parliament cleared the way for full deregulation of the state's potato industry, it brought to an end seven decades of regulation under which the Potato Marketing Corporation controlled who grew potatoes, what sort they grew, how many they could grow, and at what price they were sold.

Roy and Naida Humfrey have been growing potatoes on their Gingin properties for more than 30 years. It's fair to say Roy is a positive person and he's looking forward to good times ahead. His view is that there's a strong future for growers who focus on quality, yield and producing what the market wants.

"WA produce is some of the cleanest and freshest on a worldwide scale," he said. "With the right inputs, including quality fertilizers, we can deliver potato quality and volume."

With their son Greg joining them in the business, the Humfrey's grow approximately 2000 tonnes of fresh potatoes annually for the local market.

Humfrey and Co P/L is based west of Gingin near the coast. All their produce is grown in very low PBI Bassendean sands. They have three properties in the area. One of about eight hectares grows roughly 200 tonne of seed potatoes. The other two of about 25 hectares each grow the main crop which is planted in February and March, and harvested from July through September.

"Growing the crop over winter is more difficult and yield can be down quite a bit if you get the wrong conditions," Roy said.

"When the market was regulated we grew 11 different varieties and now that it's deregulated, were down to three, maybe four that pay the way.

The Western Australian potato industry is not the conglomerate-dominated economy that some people might think. The entire WA industry is run by less than 70 local potato growers, many of whom are second or even third generation family businesses like Humfrey and Co. Greg Humfrey (right with son Oliver) who farms west of Gingin near the coast is second generation.

Roy said he aims for a balanced fertilizer program with good levels of all nutrients. That's about 300 kg of N/ha, 100 kg of P and 400 kg/ha of K.

"Down south they would use twice as much P because of the higher fixing on those soils. But up here on the sands, P is much more readily available. My PBI is close to zero.

"Yield depends on variety and we aim for 50 t/ha for Nadine (whites) and 40t/ha for Royal Blue and Rodeo coloured varieties."

Roy said they have been dealing with Summit for about 15 years and what they like most is that Summit will blend products to fit their requirements at a reasonable price.

"We go down and pick up our requirements in January. Summit are good to do business with. It's easy to make bookings and the blending is always reliable."

Roy said he is going away from fertigation to using more granular fertilizers because nitrates are an issue with disease - mainly verticillium.

Verticillium can thrive given the right conditions. Both alkaline soil and nitrate nitrogen are known to encourage its growth.

They fertilize weekly and have to watch the sulphate fertilizers on sands as they can tend to leach.

Some of the Summit horticulture range

Product	Nutrient content (%)									
	N	P	K	S	Cu	Zn	Mo	Mn	Ca	Mg
Summit Hort	12.1	4.7	11.3	15.9	0.02	0.04		0.30		1.12
Summit Spud	7.9	12.5	11.1	7.5	0.14	0.13	0.006	0.15	2.2	0.71
Potato Yield	7.3	12.7	12.7	7.6	0.16	0.14	0.008		2.9	
Sulphate of Potash			41.5	17.0						

At Summit Fertilizers we've got you covered

Summit Fertilizers has a wide range of products for broadacre crop and pasture, dairy production and also horticultural programs. And if we don't have a product in the line-up that meets your needs, we can blend one for you.

Cropping

Unique products like DAPSZC®, MAPSCZ® and Vigour have been developed specifically for WA and have a reputation of being very high quality compound fertilizers. These products are high analysis, easy to use and provide advantages in freight, storage and handling.

The sulphur content in DAPSCZ and MAPSZC has recently been increased to 8 percent. DAPSZC has had its copper content increased to 0.1% and the zinc increased to 0.2%.

Another product made exclusively for Summit Fertilizers is Vigour. An extremely high quality easy handling seeding fertilizer, Vigour is MAP and muriate of potash based (MOP) based. With nitrogen, phosphorus, potassium, sulphur and trace elements compounded into every granule, Vigour consistently delivers outstanding results in the field. If growers want a sulphate of potash based NPK fertilizer, the Gusto range of products is the preferred option.

When K is not required then many broadacre growers look to apply NPS at seeding. The Summit NPS range provides many options to deliver essential macro nutrients, as well as having the option to provide trace elements at seeding.

If a crop operation requires more N in a compound at seeding then a product like AllRich, providing 8.7% P and 16% N is ideal. There are another three products in the range that provide the same level of nutrients, with or without trace elements.

Where a more balanced NPS fertilizer providing 14% P and 14% N is best, compound formulations like AllMAP and AllStar are ideal.

Again there are other products with different price points that provide the same level of nutrients, with or without trace elements.

MAPRite and Cereal are NPS products that provide high P and lower N at seeding.

These products - and others providing the same level of nutrients - are ideal where a grower is applying N from another source like urea or UAN at seeding.

Liquids

Summit UAN is a concentrated nitrogen source suitable for injection at seeding. It can also be applied by spraying either before sowing, or post-emergent to the crop.

If a high analysis NP compound is used at seeding and S is required along with additional N, MAXamFLO provides an ideal source of N and S. It can also be used at seeding or as a top-up during the season.

Pastures

Phosphorus, sulphur and potassium are important nutrients for pasture growth, especially sub-clover based pastures. With grass based pastures N is required in addition to the other major nutrients.

Pastures, like crops, require good nutrition in autumn to ensure early growth and also benefit from additional fertilizer applications in spring. Summit has an extensive pasture fertilizer range with products that can be matched to all these situations.

For autumn application we have a high quality superphosphate with 9.1% P and 11% S, right through to the high analysis Pasture with 18.2% P and 10% S.

High analysis Pasture provides savings on freight and handling. SuperPasture, 13.7% P and 10.5% S is growing in popularity as it provides a mix of sulphate and elemental sulphur, and has benefits in freight and handling.

All these pasture fertilizers can be blended with potassium at any ratio as required.

For spring applications there is a wide range of fertilizers that provide NPK or S at ratios required for getting the best production from clover or grass pasture.

Custom formulations

If there is not a product that delivers a growers required mix of nutrients, Summit has the capacity at all depots to blend a range of fertilizer products to provide these nutrients. One common custom formulation is a mix of MAPSZC and MOP.

This allows growers to use a rate of K that differs from what Summit can provide in a compound, and also continues to provide N, P, S and trace elements.

For more information on the Summit range, growers should speak with their Summit Area Manager.

The Summit NPK Range comprises fully granulated products which cover all cropping situations where potassium is required.

Product	Nutrient content (%)						
	N	P	K	S	Cu	Zn	Mn
GUSTO	10.0	12.0	14.0	7.5	0.05	0.10	
GustoGold	10.2	13.1	12.0	7.6	0.07	0.14	0.01
GustoRich	11.2	11.3	11.2	8.5	0.04	0.08	
GustoStar	10.4	14.5	10.0	7.1	0.08	0.15	0.02
GustoRite	10.6	15.9	8.0	6.6	0.08	0.16	0.03

GUSTO products are sulphate of potash based.

VIGOUR®	10.0	12.0	12.0	5.0	0.10	0.20	
VIGOUR Rich	10.3	13.5	10.0	5.2	0.11	0.21	0.01
VIGOUR Star	10.5	14.9	8.0	5.3	0.11	0.22	0.02
VIGOUR Rite	10.7	16.4	6.0	5.4	0.11	0.23	0.03
VIGOUR Boost	8.6	11.2	16.4	4.7	0.10	0.20	0.01
VIGOUR Mn	10.1	14.4	9.0	4.2	0.08	0.15	1.0

New and reformulated, Vigour products are muriate of potash based.

Key ingredients for product quality

Quality fertilizers including Summit's premium cropping compounds DAPSZC and MAPSZC aim to minimise hold ups in farm operations, in particular where the timing of the operation is critical. For wheat for example, the accepted penalty for delayed seeding beyond the optimum, say mid-May, is 20 to 30 kg grain/ha per day. Delays at seeding can put yield losses into the tens of thousands of dollars and dwarf any cost advantage of using a lessor quality fertilizer.

For a fertilizer to flow and be poured, augured or conveyed it needs to be granulated. Granulation size for good flow characteristics is in the 2 to 4mm range. The tighter the range in granule size the better. Fertilizers with a wide spread in granule size are at risk of segregation during handling, which can mean altered application rates in equipment, decreased blend accuracy or 'hanging up' in bins.

Granule shape is important too! Fertilizer granules should be as close to spherical as possible. This ensures good flow ability and greater resistance to abrasion and fine particle generation. Hardness of granules determines how well they stand up to handling. Some softer granule fertilizers are only suitable for topdressing as the product can degrade into finer and dusty particles if repeatedly handled, as in a seeding operation, particularly where a product is augured.

A fertilizer's ability to absorb moisture at various temperatures and relative humidities is termed it's hygroscopicity. Phosphate fertilizers are generally less hygroscopic than nitrogen fertilizers with MAP based fertilizers absorbing less moisture than DAP based fertilizers.

The hygroscopicity of a fertilizer is affected by its granule size. A fertilizer with a high proportion of fine granules or dust will absorb significantly more moisture than a well granulated product. The relative humidity in the air at which a fertilizer begins to absorb moisture is termed the Critical Relative Humidity (CRH). The CRH of blends is almost always lower than for individual components that make up a blend.

Compound formulation refers to the combining of two or more nutrients in an even mix or slurry, before granulation, so that each granule contains the same nutrients in the same proportion. In WA, compounding trace elements into fertilizers is a particularly important feature as it allows even distribution of trace elements in the drill row and this ensures full availability to the plants.

Some of the extensive range of Summit Fertilizer products

Product	Nutrient content (%)								
	N	P	K	S	Cu	Zn	Mo	Mn	Ca
NPS examples									
AllRich	16.0	8.7		12.5					
AllMAP	14.1	14.2		8.4					
AllStar	13.9	14.0		10.3	0.10	0.19		0.05	
Cereal	12.5	17.6		8.9	0.16	0.32		0.08	
ZincPlus	11.7	21.2		3.0		0.20			
Liquids									
MAXamFLO	22.0			6.2					
UAN	32								
Pasture range									
Superphosphate		9.1		11.0					20.0
SuperPasture		13.7		10.5					17.0
SuperPasture Potash 11		5.5	30.0	4.6					6.8
SuperPasture Potash 21		7.9	21.0	6.4					9.9
SuperPasture Potash 31		8.7	18.0	7.0					10.9
SuperPasture Potash 32		6.8	25.0	5.6					8.5
SuperPasture Potash 41		10.0	13.5	7.9					12.4
SuperPasture Potash 51		10.4	12.0	8.1					12.9
Supreme	5.2	13.7		13.5					10.5
Supreme Potash	3.6	9.1	16.5	9.3					7.0
Pasture CZM		18.7		5.1	0.60	0.30	0.04		13.6

High product integrity

When Summit takes in product we test to ensure the fertilizer is fit for its intended use.

We have a laboratory at the Kwinana depot that enables testing for quality parameters. Testing is carried out on representative samples of the stock during receival.

The product sample is placed in a humidity chamber for up to 48 hours under conditions of 20C and 80% humidity. It is weighed at 24 and 48 hours to determine the amount of moisture it has absorbed.

Once removed from the chamber the granule is tested for integrity and dried to ensure it is still hard

This information can be used to advise customers how to best care for the product while in storage at farm i.e. liming and tarping products during wet and humid weather conditions

We test for hardness to ensure the granules are not susceptible to breaking down during handling, either ship to shed, shed to customer's trucks, farm storage to seeding equipment and finally seeding equipment to ground.

A hardness of 4 to 6kg's is what we expect to achieve. Summit does screening tests to measure the amount of fines (<2.0mm size) and independent laboratories are used for nutrient analysis.

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