

Fertilizer News

Fine tuning 2020 fertilizer decisions

Growers are now busy fine tuning their 2020 fertilizer plans. Based on a 2019 harvest that was below expectations in many regions and well below in some, the first reaction could be to reduce sowing fertilizer inputs to limit expenditure.

This would be an understandable reaction, but is it the right strategy for this season?

What growers need to do now, before they finalise their sowing plan, is make sure they budget for enough early nutrition for anticipated 2020 yield targets. Indeed, yield potential for this season may have changed since they first sat down to calculate their fertilizer inputs.

In February and March significant parts of the WA wheatbelt had good rain, leading to soil moisture reserves in many areas. Depending on the amount and circumstances, that could enable some earlier sowing, which would in turn help set up

some higher yield potential crops with higher demand for nutrients.

For some, the cropping program or rotation may have been updated due to a change in circumstances. For example, soil moisture may make sowing more canola a likely proposition. Growing more of a crop like canola or even lupins would require a different fertilizer strategy than the wheat or barley they replaced.

We know canola has a higher requirement for sulphur (S) than cereals, which may change early fertilizer nutrition.

It would indeed be short sighted if a 'knee jerk' reaction to last season and subsequent under fertilization limited yield potential for the coming season.

Given all of that, growers will need to weigh up their own individual circumstances and make sure their plans are as up to date as they can be. Our Summit Area Managers are here to help.

Going forward, some basics hold true for sowing crops every season.



Eddy Pol

Executive Manager – Marketing & Sales.

epol@summitfertz.com.au

Mobile: 0429 902 582

Phone: (08) 9439 8919

Ensure enough starter P

Where growers are cropping phosphorus (P) responsive country in particular, cutting P rates can limit yield potential and significantly reduce yields. The same applies to potassium (K) if soil reserves are low and K is not applied early enough.

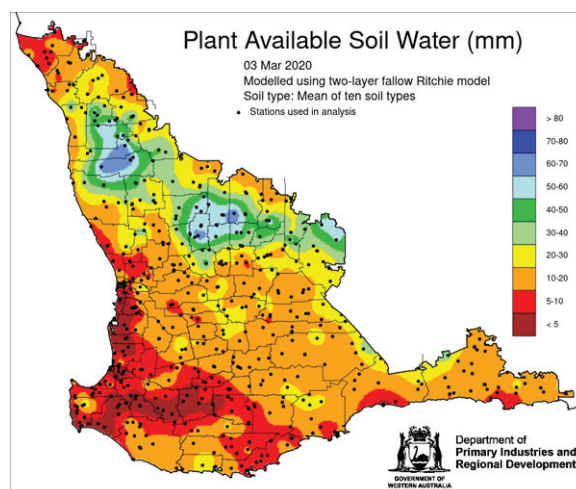
The P rate is critical to get right at seeding. P is not mobile in the soil like nitrogen (N), S or K and therefore cannot be topped up later in the season if conditions become more favourable for crop production.

A key role of P in plants is within the molecules needed for energy transfer.

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Ensure enough starter P

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 for use in photosynthesis and protein generation, without the P-mediated energy transfer this N (and the dollars used to purchase and apply it) will never be fully efficient.

P is removed from the soil 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 and pH can also have an influence.

What is well known is the availability of applied P decreases over time. This is part of the reason adequate P needs to be applied every year and 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.

One of the most significant outcomes of Summit's 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 1).

Soil testing

Numerous paddocks have been soil tested by Summit over summer and into autumn to determine their nutrient status and make informed fertilizer decisions based on that information and the potential yield in the paddock.

But not every paddock gets tested every year. In that situation, nutrient requirement can be roughly calculated on what the 2019 crop removed from the paddock and a decision made to at least replace what has been removed. The crop nutrient removal table below is a good general guide.

In the case of P, growers should factor in a portion that may become so well-fixed to the soil that plant availability will be almost nil.

The influence of P on the effectiveness of N

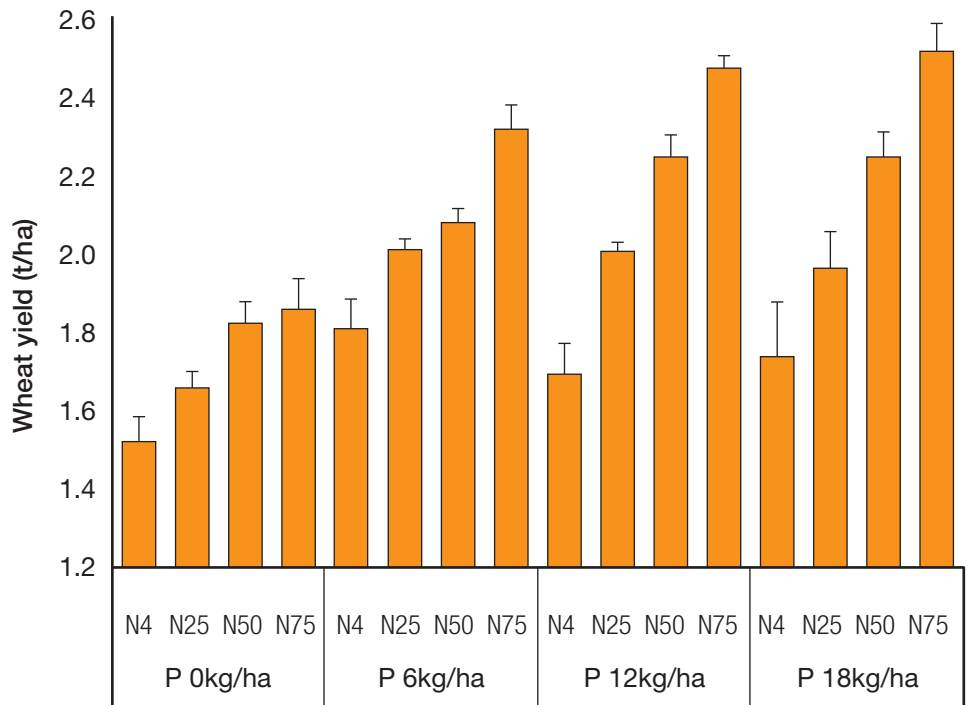


Figure 1. Wheat in a Ballidu trial showing a significantly greater ability to respond to N applications when P is in adequate supply from fertilizer banded below the seed.

Table 1. Crop nutrient removal table - at least replace what you've lost

	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



Summit Area Manager, Kobus Marais, updates Merredin growers on Summit's canola trial on ameliorated soil at Nokaning Farms at a field walk last year. - Story on page 3.

Canola returns after soil amelioration

Maximising returns from crops grown on soils improved by processes such as liming, gypsum application or deep ripping is critical. Growers need to recover what are typically expensive amelioration costs and take advantage of the improved soil conditions with higher production.

Research on crop nutrition after soil amelioration is continuing to build and Summit is a major contributor to filling the knowledge gap with WA trials.

One of our field trials at South Burracoppin in wheat in 2017 saw a large improvement in rainfall use efficiency due to a combination of liming, ripping and extra nutrition on a previously compact acidic sandy soil. This translated to a substantial increase in returns two years after.

In 2019, as part of our ongoing commitment to researching nutrition requirements after soil amelioration we ran a new trial, this time in canola at Nokaning Farms. Establishing small plot trials of canola on recently ameliorated soil is often difficult because variable sowing depth with a small seed has a big impact on growth.

Working together with Nokaning Farms, we were able to utilise their seeding equipment to establish the canola, after laying down additional supplementary phosphorus (P) and potassium (K) on ripped and non-ripped soil that had received gypsum and lime surface amendments.

In a year characterised by a late start, low sub-surface moisture and a sharp finish to less than 200 mm growing season rainfall, deep ripping alone improved the yield of Bonito canola and allowed nitrogen (N) applications to be utilised slightly better. However, additional P improved this yield response to nitrogen on the deep-ripped plots significantly and, the addition of K increased the yield response even more. Only P improved yield on the non-ripped plots whereas N and K were ineffective.

The additive effect of soil amelioration and increasing fertilizer supply is clearly expressed when we calculate the additional margin returned from nutrient application to ameliorated soil. (Figure 3.)

Where ripping improved profit by around \$50/ha on its own, the addition of another 10 kg/ha P, 20 kg/ha K and 40 kg/ha N to ripped soil lifted profit by up to \$140/ha. The trial demonstrated what is readily achievable in what were less than ideal

seasonal conditions for canola.

The key message for growers is that nutrition is a vital component of a suite of things that, when properly matched, work together to produce the best agronomic and economic outcomes.

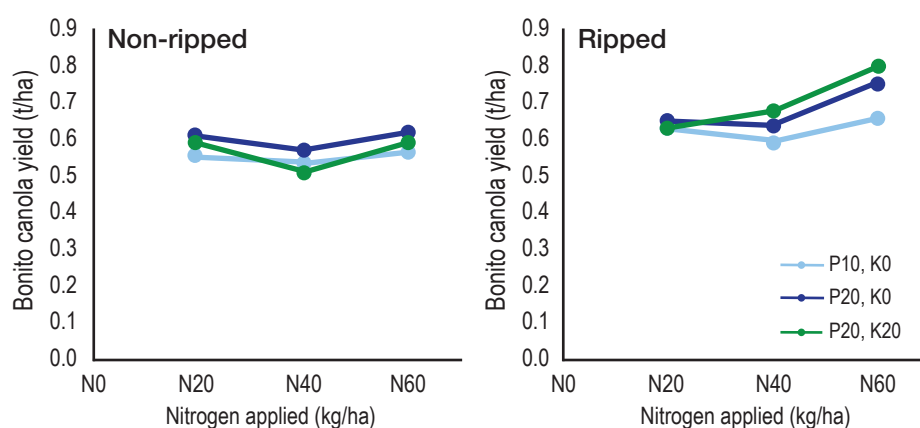


Figure 2. Applying extra P and K to ameliorated soil allowed 2019 canola to respond to in-season N applications at Nokaning for significantly higher yield production.

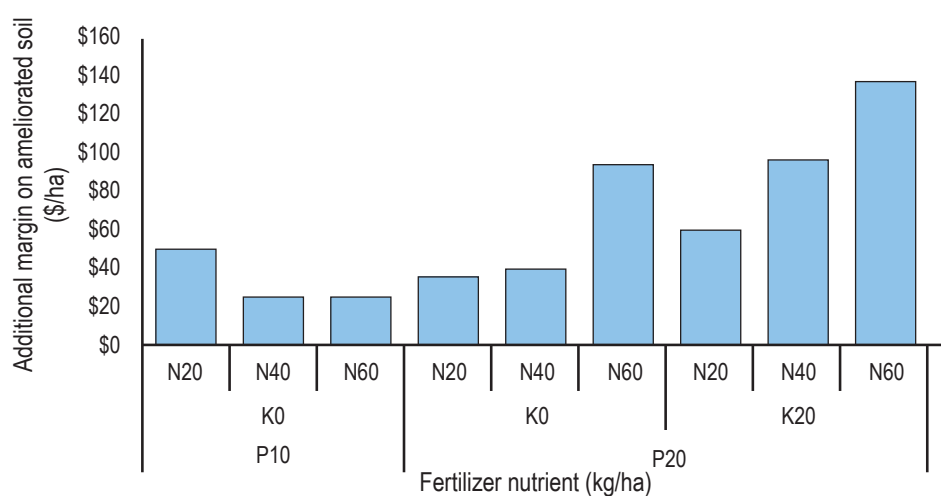


Figure 3. Soil amelioration and nutrient application had additive effects on gross profit from canola in the Nokaning trial.

Key messages

- Amelioration has a significant positive impact on yield potential.
- Reassessment of all resource inputs to cropping programs after amelioration is very important.
- Small investments in supplementary nutrition post-amelioration can have a substantial additive effect on crop production relative to the cost of extensive mechanical soil cultivation actions.
- Matching the improved yield potential with appropriate nutrient rates at establishment:
 - Enables the achievement of higher yields and greater rainfall use efficiency than those attained from amelioration alone;
 - Provides adequate base nutrition to allow maximum efficiency of in-season nitrogen when the opportunity arises;
 - Improves pay-back to cover and exceed costs of amelioration operations in a short timeframe.

Compound vs coated fertilizers

At Summit we supply compound fertilizers, coated and straight fertilizers as well as blended products. It's really up to the client as to what suits the budget and the program best. Farmers often ask about compounds versus coated as the analysis may well be similar and yet the cost is different.

Compound fertilizers are the result of a chemical process in manufacture. They combine the nutrients in an even slurry or mix before granulation, so that each granule produced contains the same nutrients in the same proportion. Premium compound fertilizer examples would be DAPZSC and MAPZSC (both with N and P) and Vigour (supplying N, P and K). DAPZSC, MAPZSC and Vigour all have zinc (Zn), sulphur (S) and copper (Cu) also compounded into every granule. That makes them an ideal broad-spectrum nutrient source for early crop establishment.

In the past few years Summit has replaced coated zinc and manganese (Mn) fertilizers with full compound products. The new products include DAP Cu & Zn, MAP & Zn, MAP & Mn and MAP Cu & Zn.

Because of our soil types in WA, compounding trace elements into fertilizers is particularly important as it allows even distribution of trace elements in the drill row and this ensures full availability to the plants.

These popular products offer premium handling, high concentration and effective in-furrow nutrient distribution and of course they cost a little more.

History has shown that coated products don't always deliver the same outcomes as fully compounded ones. With coating, trace elements are held onto the compound with



Fully compounded Vigour granules

oil or a sticker, which itself may create handling issues at seeding. This problem can be exacerbated if a fungicide is also applied onto the coated fertilizer granule, because it is not absorbed into the fertilizer granule due to the oil coating. Hence the product remains wet.

Alternatively, if the oil or sticker rate is reduced to limit the impact on handling at seeding, there is a risk that applied trace elements can rub off the fertilizer. Granules can be abraded by handling during dispatch, transport or on-farm handling. This abrasion would lead to poor distribution of the trace elements for the crop and may well result in poor yields if the crop nutrient levels become deficient.

To ensure even coating, Summit coated products are manufactured in a fertilizer drum well before dispatch. This enables the product to dry before delivery and/or storage. So in summary, coated fertilizers can be cheaper, but they can also have their own unique handling issues.

Growers should contact their local Summit Area Manager for more information on these trace element fertilizers.

Soil chemistry & manganese availability

The chemistry of manganese (Mn) in the soil is complex and a history of Mn agronomy based research world-wide has typically shown a weak relationship between soil test values and rate responses in crops. Similarly, WA agriculture has seen specific and localised Mn deficiencies, but predictive indicators are not consistent across a wide range of soil types and conditions.

Mn deficiency remains a concern for growers. Lupin is subject to split seed and yield loss with insufficient Mn supply. Growers are reporting some new lupin varieties, such as Jurien, to have a thin seed coat and be susceptible to seed splitting.

Cereals can also be susceptible to Mn deficiency on alkaline soils and others with high organic matter and Mn-fixing properties.

Availability of Mn in soils is governed by reduction and oxidation processes. The divalent or 'reduced' form (Mn²⁺) is readily available and taken up by plants while oxidised Mn (predominantly Mn⁴⁺) is not.

The aim of Mn fertilizers, therefore, is to release Mn²⁺, and many compounds have been utilised as sources of Mn for plants. Soil conditions and processes, such as pH, will strongly influence this release and transformation. Ultimately, Mn fertilizer must provide a net increase in Mn²⁺ where plant roots and soil solution interact to be effective.

Table 2. Summit compound fertilizer product analysis

	N	P	K	S	Cu	Zn	Mn	t/m ³
DAPSZC®	16.9	18.2		8	0.1	0.2	0.1	0.98
MAPSZC®	11.6	19.8		8	0.2	0.4	0.1	1.03
GUSTO	10	12	14	7.5	0.05	0.1		1.12
Vigour®	10	12	12	5	0.1	0.2		1.03
DAP Cu & Zn	17.8	19.7		1.7	0.32	0.64		0.96
MAP Cu & Zn	10.5	22.5		1	0.32	0.64		0.95
MAP & Mn	9	18.8		11			4	1
MAP & Zn	11.2	22.4		1.9		0.5		0.95

Table 3. The old and the new

	MAP&Mn (%)	
	Old	New
Nitrogen	10.4	9.0
Phosphorus	21.5	18.8
Sulphur	1.9	11.0
Manganese	4.0	4.0

Better Mn uptake from compounded MAP & Mn

In 2020, Summit Fertilizers introduced a new formulation of MAP & Mn. It continues to be a fully compounded product however is now manufactured using 100% manganese (Mn) sulphate. With excellent handling characteristics, 4% Mn in every granule, much higher sulphur and slightly lower phosphorus analysis than its predecessor, MAP & Mn can be used as a standalone seeding product. It can also be custom blended with other products to achieve optimal nutrient rates for your soil types and farming system. Summit field research has guided the development of this new product.

One of Summit Fertilizers' key aims is to continue to supply the highest quality crop nutrient products with the best agronomic efficiency.

A suite of products containing manganese (Mn) is now available for crop application. In 2019, we established a number of trials around the state to assess the effectiveness and impact of different Mn fertilizer strategies. In-particular, how the form of Mn used in different products provided Mn for uptake by lupin and cereal crops in comparison to a straight Mn sulphate salt.

Grain yield was only affected at the Eradu lupin site where significant Mn deficiency was evident. However, plant tissue samples are a very effective way of determining nutrient supply differences, especially for trace elements. Extensive plant sampling of the trial sites was undertaken. The laboratory analysis revealed that:

- Uptake of Mn from the different fertilizer sources differed substantially in all crops.
- Manganese oxide sources appear to be inefficient in supplying Mn to crops in the year of application, even when acidulation is expected to have occurred in the manufacture of a phosphate compound fertilizer.
- Foliar Mn application can increase plant tissue Mn concentration,

although growers should be aware that a correction of deficiency in this way must be done as early as possible to limit growth and yield impacts.

- If a cropping system has an ongoing Mn input requirement, a granular fertilizer with Mn originating

from a sulphate source will provide the best agronomic benefit.

- Manganese sulphate blends can effectively supply Mn, but care needs to be taken using these since storage and handling can be more demanding than using a compounded product.

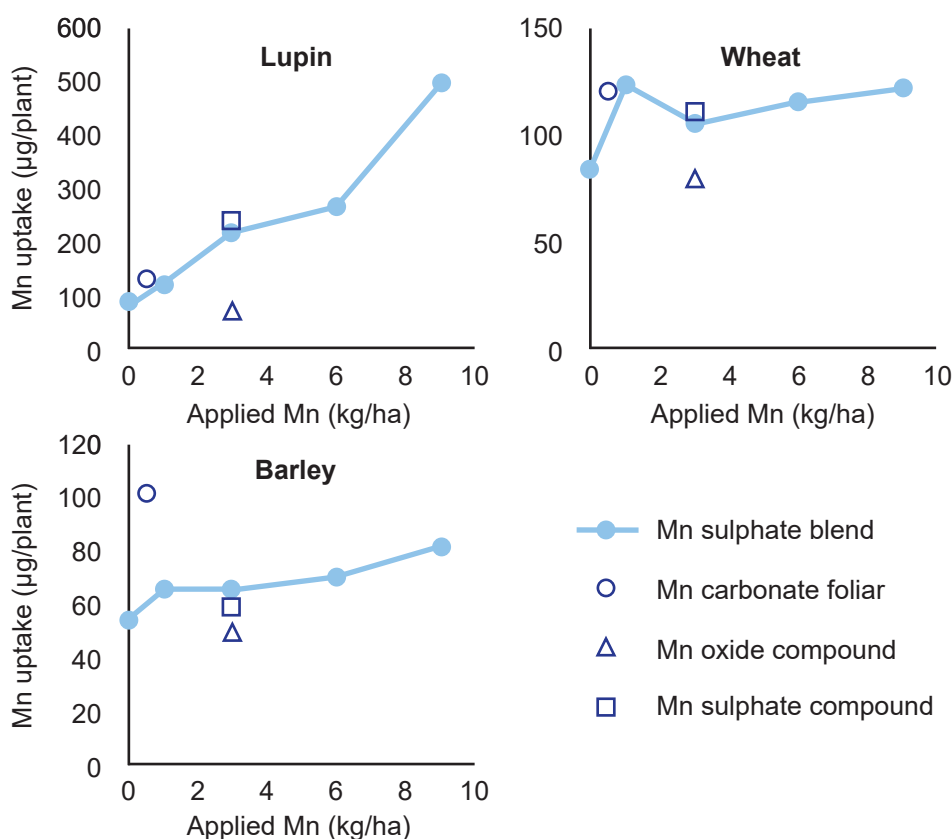


Figure 4. Plant uptake of manganese from different sources in 2019 experiments against benchmark MAP.

Table 4. Summit Fertilizers manganese trial locations and design

Location	Crop	Mn rates (kg/ha)	Replicates	Soil	pH
Eradu	Lupin	0, 0.5#f, 1, 2, 3^, 6, 9	6	Eradu sand	5.2 - 6.6
Cordering	Barley	0, 0.5#f, 1, 3*, 9	6	High PBI forest gravel	4.6 - 5.5
Tincurrin	Wheat	0, 0.5#f, 1, 2, 3*, 6, 9	6	Light grey sand	4.4 - 5.0
Dandaragan	Lupin	0, 0.5#f, 1, 2, 3*, 6, 9	6	Loamy sand	5.5 - 6.8

#f Foliar liquid Mn carbonate

^ MAP + Mn sulphate blend/Mn oxide compound comparison

* MAP + Mn sulphate blend/Mn oxide compound/Mn sulphate compound comparison

Summit Technical Services

In addition to supplying farmers with the highest quality fertilizers available, we also provide value to our customers through delivering impartial, best-practice fertilizer recommendations based on robust scientific data.

Our Technical Services package encompasses three core elements;

- Field Research,
- inSITE (soil and plant testing model)
- and Fuel Gauges.

Field Research

Last year, Summit Fertilizers carried out 34 trials across the WA agricultural region and worked alongside Grower Groups, research organisations and farmers. Data collected from our field research program is used to continually refine our inSITE soil and plant testing recommendation model, improve our products and keep our Area Managers up to date with the latest information relevant to their region.

inSITE

Accurate soil testing is an essential part of developing a comprehensive fertilizer strategy, and plant testing can be a great way of determining whether specific nutrients are limiting growth once the crop is up.

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

Based on the lab results and inSITE modelling, our Area Managers can then recommend the best fertilizer to achieve target yields.

All results and reports are available to customers through the SummitConnect portal.

Fuel Gauges

A Fuel Gauge is a strip in the paddock (typically 2m x 100m) containing a non-limiting rate of a specific nutrient (most often nitrogen). They can be carried out across a wide range of crops.

Fuel gauges are an excellent way of in-season nutrient monitoring, and allow Summit Area Managers to measure nutrient response against farmer practice. Once applied, the strips can be analysed throughout the growing season with a GreenSeeker® and results calibrated using N-Calc software.

N-Calc can then predict the required rate of nitrogen to be applied and the potential yield loss from not applying additional nitrogen.

For more information on Summit Technical Services speak to your local Area Manager or visit <https://www.summitfertz.com.au/services/.html>

Let's connect with SummitConnect

Summit Fertilizers is committed to ease of doing business and freeing up more time for our customers so they can spend it on what's important to them.

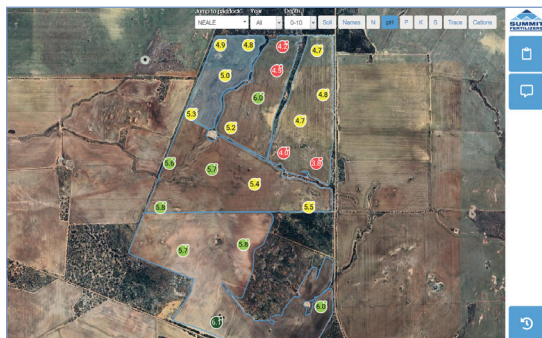
We have recently launched our new and improved SummitConnect online customer portal, which has a number of impressive new features.

Anywhere and anytime

The latest version of SummitConnect links customers to our inSITE platform, so they can view and download their entire soil and plant test history, including recommendation reports.

Another exciting feature that has been added are trend maps, which allows farmers to visualize how soil nutrients, pH and other soil properties are tracking over time, across different depths and in different paddocks.

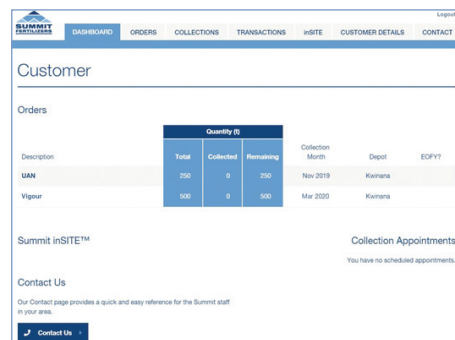
Ultimately our aim is to provide our customers with the most accurate data, in the most accessible way, enabling them to make better decisions with regard to their fertilizer inputs for next season and beyond.



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

The new SummitConnect dashboard (above right).

If you'd like to learn more about how our new SummitConnect customer portal could benefit you, get in touch with your local Summit Area Manager. To get started on the new version of SummitConnect for the first time, contact our team at support@summitconnect.net.au or call 08 9439 8999.



More simple and convenient

We've also developed a new user-friendly interface, allowing clients to easily view:

- Orders - see details of all your orders with Summit, including collection month and payment terms
- Collections - view individual fertilizer collections and download loading and weight dockets.

- Transactions - review your payments, credit limit, monthly statements and download your tax invoices.

With the new SummitConnect portal everything you need is in one place, which makes it easier than ever to manage your business with us. You can even provide your accountant or consultant with access to your SummitConnect to save time when it comes to the end of the financial year.

The best time to Fuel Gauge



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 are in need of this extremely useful tool, contact your local Summit Area Manager now.

Eddy Pol takes on Executive Manager role



Former Northern Regional Sales Manager Eddy Pol has stepped up to the position of Summit Fertilizers Executive Manager – Marketing and Sales. With many years experience in agricultural advice, sales and marketing, Eddy was the perfect candidate to fill this challenging role.

A fond farewell to Frank



After 13 years with Summit, and 35 years in the fertilizer industry we said a fond farewell to Frank Ripper, our now previous Executive Manager of Marketing & Sales late last year. Frank decided to retire from Summit, and is looking forward to pursuing his passion for WA agriculture by committing more of his time to farming.

Frank was instrumental in the formation of Summit's Field Research program, the development of the SummitConnect customer portal and the introduction of a plan to improve Area Manager retention, all of which have enhanced value for Summit customers throughout the years.

Welcome Rey Jabonero



Summit Fertilizers is delighted to welcome Rey Jabonero to the Finance and Administration team. Rey has a Bachelor of Commerce degree from Curtin University, and is well equipped to assist customers with billing and accounts enquiries. His previous role was helping small to medium sized family owned businesses with their accounting needs.

Outside of the office, Rey enjoys playing volleyball at UWA and at Curtin University.

He started with Summit in December and can be contacted directly on (08) 9439-8937 or email accounts@summitfertz.com.au.

Welcome Wayne Foot



Wayne Foot has recently joined the sales team as the new Northern Regional Manager, taking over from Eddy Pol. Wayne is originally from Wongan Hills and has a wealth of experience in the agricultural industry. He previously owned a Landmark agency in Dumbleyung, and worked at Elders as a Regional Fertilizer Manager from 2005-2009. Over the last 10 years Wayne has supported a number of small agricultural companies with sales/demand planning and logistics services through his own business. He is looking forward to working with the Northern Area Manager group and meeting old acquaintances.

Your Local Summit Fertilizers Area Manager



GERALDTON
Shane Turner
0429 947 919



COOROW
Juliet McDonald
0429 945 332



WONGAN HILLS
Brenna Gray
0408 711 954



MOORA
Brett Beard
0429 900 607



NORTHAM
Brayden Noble
0417 490 047



KELLERBERRIN
Tracey Hobbs
0447 248 732



MERREDIN
Kobus Marais
0427 766 508



NARROGIN
Brett Coxon
0427 766 506



CORRIGIN
Steve Cooke
0429 934 243



BUNBURY
Ralph Papalia
0427 766 535



WILLIAMS
Jarrad Martin
0427 788 521



KOJONUP
Chloe Turner
0447 469 245



LAKE GRACE
Mark Stephens
0427 766 517



ESPERANCE (WEST)
Tim Donkin
0408 092 355



ESPERANCE (EAST)
Nick Donkin
0428 715 045



ALBANY (WEST)
Mark Ladny
0498 223 421



ALBANY (EAST)
Andrew Wallace
0427 083 820



www.summitfertz.com.au

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