

Summer 2016

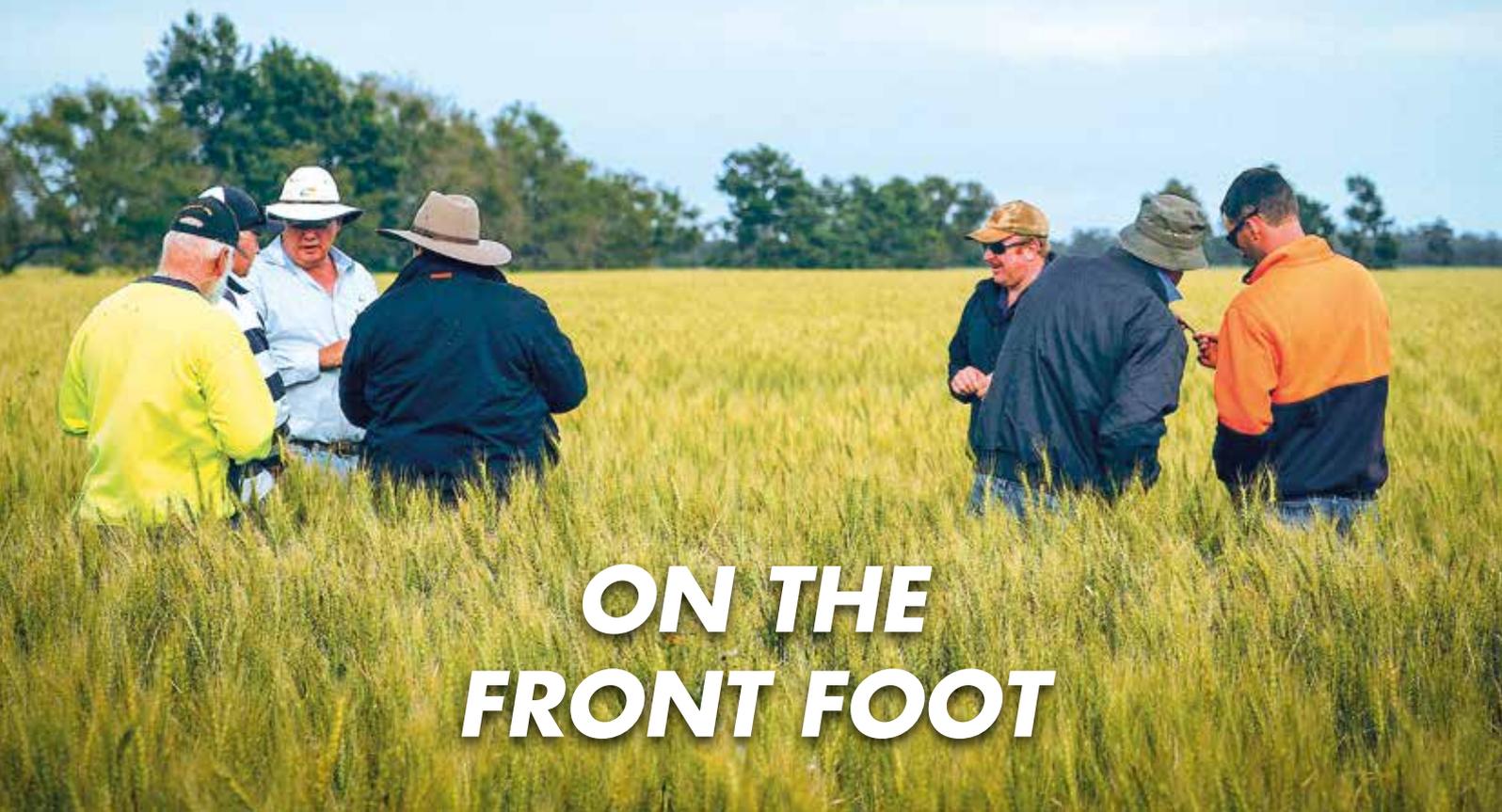
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BioAg COUNTRY

OCTOBER 2016: BioAg's Coribimilla Crop Walk in the Riverina NSW allowed growers from across the area to catch up and share best practices.

Anton Barton
Managing Director, BioAg



ON THE FRONT FOOT

For the majority of producers, the amount of rainfall this season has been fantastic for pasture and crop growth.

The down side of all this growth is the greater than normal quantity of nutrient removed by it, particularly phosphorus, sulphur, potassium and calcium.

Nutrient removal has come in the form of:

- Increased production (net export)
- Leaching (more rain means more leaching)
- Lockup of nutrient in soil

This explains the increased demand for nutrients this season, something that is being reinforced by favourable terms of trade for farmers, especially in the beef and sheep sectors.

In addition to major nutrients, trace elements may well require replacement in order for crops and pastures to perform optimally throughout the coming growing season.

The long wet winter and wet spring have the potential to delay summer fertiliser purchases, transport, and application, as the hay and silage making window gets pushed closer to Christmas.

If an early autumn break eventuates, this will result in the capabilities of fertiliser suppliers, transport operators and spreaders being pushed beyond capacity.

The upcoming summer and autumn fertiliser season has the potential to leave many farmers unhappy with fertiliser not applied on time – if at all.

The solution is to get in early.

Get your BioAg agronomist on the job with soil testing and nutrient program development now, so that you can beat the inevitable rush.

Get the right amount of the right products to meet your soil nutrient demands on farm on a timely basis.

Whether product is applied by ground spreading, aerial or drilled, the same rules apply.

Once you know what nutrients you need to buy, then you can take advantage of early bird (pay now, take later) or deferred terms (take now, pay later) deals.

BioAg traditionally offers deals at this time of year, every year, so talk to your BioAg agronomist or distributor for current pricing and available deals.

Phosphorus Solubilising microbes and the soil



- Studies show the pasture use efficiency of slow release P fertilisers is much higher than water-soluble fertilisers
- If you are able to ensure the right types of organisms in sufficient quantities are present in the soil, then this action alone will increase fertiliser effectiveness and PUE

Paul Medlock
Agronomy & Sales Manager
Northern NSW



There has been much talk in recent years about the benefits of healthy soil biology. But what does this actually mean?

Soil biology is closely related to the effective and efficient utilisation of applied fertiliser by a pasture.

The **National Phosphate Trial** (McLaughlin 1997) describes it as "a plants ability to scavenge any phosphorus that is plant available in the soil phosphorus pool".

This scavenging by the pasture for any applied P is known as pasture use efficiency (PUE).

McLaughlin (2011) also noted the importance of residual effectiveness of phosphorus and its importance in soil fertility.

This study showed that the pasture use efficiency of slow release P fertilisers is much higher than water-soluble fertilisers.

This is mainly attributed to water soluble P accumulating in the top 2-4 cm of the soil surface. In dry conditions this can lead to P deficiency from lack of water and poor root development.

Plants with poor root development cannot handle dry conditions as well as plants with an extensive root system.

Water Soluble fertiliser encourages herbage or tillering but not root development.

By delivering a slower and more constant release of P, an RPR based fertiliser such as BioAgPhos encourages more extensive root development.

This in turn improves P scavenging and increases the amount of moisture gathered, a very important characteristic during periods of low rainfall.

Microorganisms

Microorganisms are now recognised as part of the complete picture of long term pasture sustainability.

Microorganisms are able to store inorganic P internally, but only if there are high soil P levels available.

This is where P solubilising microbes and other soil organisms are crucial.

There are a range of bacteria (*Pseudomonas*, *Bacillus* and *Rhizobia*) and fungi (*Penicillium* and *Aspergillus*) that are considered to be the most effective in solubilising P.

If you are able to ensure these types of organisms in sufficient quantities are present

in the soil, then this action alone will increase fertiliser effectiveness and increase PUE.

So the aim is not just apply fertiliser, but apply the most effective fertiliser in conjunction with stimulating beneficial soil organisms (Mohammadi 2012, Sharma et al 2013).

Chemolithotrophic bacteria such as *Thiobacilli* use inorganic compounds, sulphur, ammonium and ferrous iron for self-nourishment.

So when used as an inoculant (such as with the BioAgPhos solid fertiliser range), these organisms will encourage the release of P in a plant available form (Ghani et al 1993).

If we continue along the lines of beneficial soil organisms I must mention the importance of worms.

Studies have found that earthworms not only increase the effectiveness of Reactive Phosphate Rock (RPR), but lime also (Mackay et al 1981).

This research found that earthworms improved the processes of nutrient enrichment and P cycling, and vertical distribution of ground applied soil ameliorants (for both pH and calcium) to a depth of 15cm.

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In terms of losing P to the environment, the trial showed that RPR loses far less P (virtually nil) than any of the other fertilisers

We all know how important the use of phosphate (P) fertiliser is to the growing of crops and pastures, and how it influences production.

P is essential for plant growth.

- It plays a role in photosynthesis, respiration, energy storage and transfer, cell division, cell enlargement, and many other vital plant functions
- P promotes early root formation and growth
- P is a large contributor to yield and profitability in pastures and crops
- P assists in the transportation of nutrients through the plant

What we must also take into account, especially after the wet conditions we have had recently, is nutrient wash (mostly nitrogen and phosphorus) into our dams and creeks.

This has the potential to cause and accelerate eutrophication of these waterways and the growth of algal blooms (cyanobacteria).

To complicate this issue, the eutrophication can occur many miles away from where the high P agricultural runoff may have occurred.

Water-soluble phosphate fertilisers such as single superphosphate, MAP and DAP can be a greater factor here.

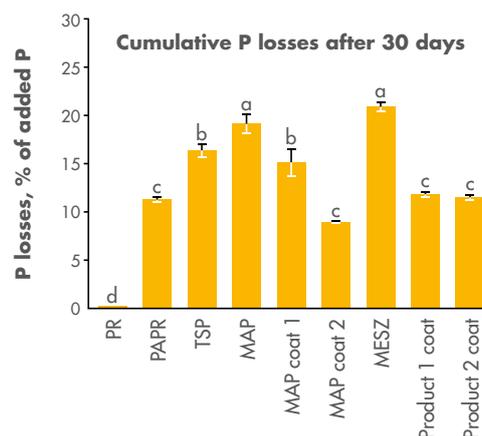
At the recent National Fertiliser conference, the Fertilizer Technology Research Centre (University of Adelaide) presented the findings

from their research of different fertiliser sources and their potential for runoff and water eutrophication.

The trial looked at various common, as well as coated fertilisers, including:

- Reactive Phosphate Rock (RPR)
- MAP (with and without coatings)
- Triple super phosphate (TSP)
- Partially acidulated phosphate rock (PAPR)

In terms of losing P to the environment, the trial showed that RPR loses far less P (virtually nil) than any of the other fertilisers (see graph below).



Ref: McLaughlin, Australian Fertiliser Conference, 2016

David Phelps
Agronomy and Sales Manager
Southern NSW (Pastures)



While this is good news for waterways, it is also good news for farmers when choosing a source of capital P supply.

This type of result from RPR is one of the reasons why BioAg chose it as the basis of its solid fertiliser range.

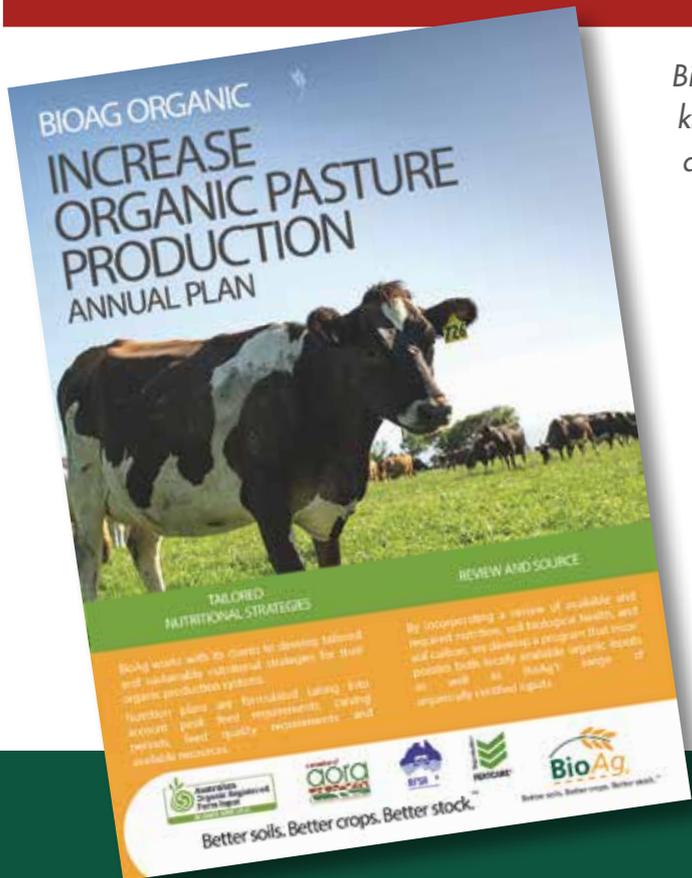
BioAg's **BioAgPhos** range of solid fertilisers is based on some of the best quality RPR available anywhere in the world. The characteristics of this RPR are:

- Naturally high levels of nutrient
- High levels of reactivity (increasing its rate of nutrient release when on farm)
- Well below the allowed limits of contaminants such as heavy metals
- Being so resistant to losses to the environment, allows for spreading at any time throughout the year

During manufacture, BioAg replaces more commonly used acids with its own nutrient solubilising digesting agent. By doing so, BioAg is able to deliver a source of P (and other nutrients) that releases immediately and continuously, without acidifying the soil.

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Organic Pasture Production



BioAg has recently compiled its organic pasture production knowledge, which is now available in one comprehensive document.

The Increase Organic Pasture Production brochure is a best practice guide on how to get the most and healthiest production from each season throughout the year.

The guide incorporates knowledge that resulted from BioAg's organic pasture trials conducted across 3 states in 2016, which added to BioAg's existing body of knowledge on the topic, gathered over the past 17+ years.

To get your own copy, contact a BioAg Agronomy & Sales Manager by heading to our web page www.bioag.com.au and clicking on Agronomy and Sales.

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It has also been noted that the exclusion of earthworms in pot trials lead to a reduction in PUE of both RPR and SSP.

So it can be said that there are many ways to enhance soil biology to access the phosphorus that is in the soil pool.

Choosing a fertiliser that is more effective in increasing pasture use efficiency, while also improving soil biology:

- Grows healthier plants
- Provides better ground cover
- Increases infiltration of rainfall
- Reduces runoff and waterway pollution

At the end of the day you want the fertiliser you apply on your farm to stay there, not be a fertiliser that will wash into your dams and rivers or the neighbour's farm.

If you would like to talk about pasture improvement strategies and getting more from your inputs, contact a BioAg agronomist.

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In addition to being resistant to leaching and wash-away (as highlighted by the trial results mentioned above), this also means the rate of lock up is reduced.

The improved microbial activity in the soil also helps to unlock previously applied phosphorus, sulphur, calcium and other nutrients, which assists in the development of improved soil structure and increased fertility.

The range is compatible with lime, gypsum, manure, and elemental sulphur.

Combining BioAg fertilisers with these ameliorants before spreading allows for single-pass applications via belt spreader or by air.

BioAgPhos contains a high amount of P (12.7%), as well as 35% calcium and 1% sulphur.

Around 1/3 of the P is soluble in a 2% citric acid solution, meaning it is immediately available to the plant upon spreading.

The remaining 2/3 undergoes a continuous solubilisation action by the microbial digesting agent, releasing over the entire season and into the second year following application.

<http://www.fertilizer.org.au/Portals/0/Documents/Conf2016/Rapid%20Screening%20of%20Controlled%20Release%20Fertilizers%20-%20McLaughlin.M.pdf?ver=2016-09-22-110810-110>

SAFE LOADING reminder

A reminder to anyone visiting the Narrandera plant to pick up liquids.

Please ensure your vehicle and/or trailer is correctly rated to carry the size and weight of the load you intend to pick up.

By law, BioAg cannot load any vehicle that is not sufficiently rated.



Better soils. Better crops. Better stock.™

**For more information,
phone 02 6958 9911 or visit www.bioag.com.au**