

Spring 2016

In this edition

- **Wet feet!!!**
- **Rice Research Australia drill sown rice growing trial results**
- **Growing more pasture [BioAg Trial Results Summary 2016]**
- **Introducing two new products**
- **Commins achieve more success in cotton**
- **Spring breakfast in the Riverina**

BioAg COUNTRY

Whilst nitrogen is important to increase grain yields and pasture dry matter production, it is imperative not to forget about the other nutrients the plant requires to convert sunlight into glucose and nitrogen into protein.

An oatsen hay crop that has recently received a foliar application of Balance & Grow (2 l/ha) and calcium nitrate (5 l/ha), which has resulted in an increase in vegetative growth and will be cut for hay by the time we go to print

Wet feet!!!

How quickly fortunes can change, and confidence with it.

It doesn't seem that long ago that we were all talking about the terribly dry spring and summer, and the late autumn break. Now the conversation is about how the crops are suffering from waterlogged conditions, and how we can't get tractors onto some paddocks as they'll bog or tear up the paddocks, or both.

With a full or near full soil moisture profile, growers' confidence for good yields is improving and as a result there is increased demand for nitrogen applications to bolster that yield potential.

Whilst nitrogen is an important component in determining both yield and grain protein, it is not the only nutrient that the plant requires to convert sunlight and water into grain or pasture growth.

Unfortunately, with all this rain we now have a lot of anaerobic soils, and plants that have not been able to photosynthesise properly because of the extended periods of cloud cover.

What does mean from a crop nutrition point of view?

The reduced photosynthetic capacity of plants has reduced the plants ability to produce glucose (carbohydrates), which is the energy metabolite for the whole system.

Without sufficient glucose the cells within the plant cannot convert nitrogen into amino acids, amides or peptides. This has been the metabolic process that has caused the cases of nitrate poisoning in the western district this winter.

A lack of oxygen in the soil also impacts trace element availability.

What we typically see is an increase in iron and manganese availability, with the subsequent decrease in the uptake of zinc, boron and copper. These traces are important as they are precursors to many metabolic functions such as auxin production (zinc), nitrogen

Continued on back cover

Pasture and hay crop fertiliser strategy
(late winter/early spring)

Granular urea
Balance & Grow (2l/ha)
Calcium nitrate (5l/ha)

Crop fertiliser strategy with spray cart access
(late winter/early spring)

Foliar UAN (20 l/ha)
Fruit & Balance (2l/ha)
Zinc sulphate (hexahydrate) (300gms/ha)
Copper sulphur (pentahydrate) (150gms/ha)

Growing more Pasture

[BioAg Trial Results Summary 2016]

As we mentioned in the previous newsletter, stimulating growth of pasture during the winter months is pivotal for both productivity and profitability for our grass based livestock production systems.

Over the past months, BioAg has been conducting pasture trials in NSW, VIC and TAS, looking at dry matter production levels and pasture feed analysis changes, following the foliar application of the following products;

- Balance & Grow (B&G)
- Urea Ammonium Nitrate (UAN)
- Gibberellic Acid (GA)

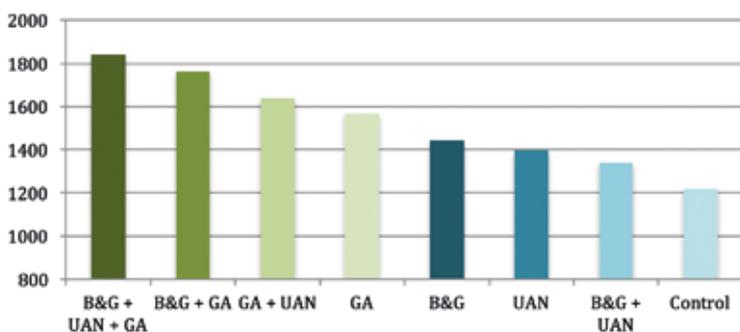
These products were applied separately, as well as in various combinations, with the idea of evaluating what combination provided the most value in terms of dry matter production and overall feed test.

Whilst only three trials have been harvested at the time of putting this newsletter together, the initial results are very interesting.

Unfortunately the results are a little late to benefit 2016 winter pastures, however will provide some knowledge for boosting spring pastures (less the GA), and provide protocols for enhancing production next winter.

While each product by itself, or when partnered with another product produced more dry matter than the control, there is no doubt that all three products combined produced the greatest result in three out of three trial site locations in NSW, VIC and TAS.

Dry matter (kg/ha)



Feed Quality Analysis

It is well recognised that the application of Gibberellic Acid produces more pasture dry matter, when applied through the cooler months of winter.

The mode of action of the natural plant hormone GA, is to stretch cells. This is why there is an increase in pasture growth.

As part of this trial we also analysed the quality of the feed on offer, to evaluate if the extra feed produced was of significant value for the stock grazing it. A complete feed analysis test was completed for each treatment, which has produced a significant amount of data.

The main point to draw from this was that the combination of B&G, UAN and GA produced the best results from a metabolisable energy (ME), rumen digestible protein (RDP) and total digestible nutrients (TDN).

It also had the lowest Neutral Detergent Fibre (NDF) and Acid Detergent Fibre (ADF) levels, which are indicators of the digestibility of the pasture.

Organic Pasture

There is currently significant interest in organic pastures systems, particularly dairy.



One of the perceived limitations with organic pasture systems is providing enough pasture growth through the winter months, with the alternative being supplementary feeding with expensive organically certified grain or hay.

Another component of this trial was to test similar strategies in organically certified combinations.

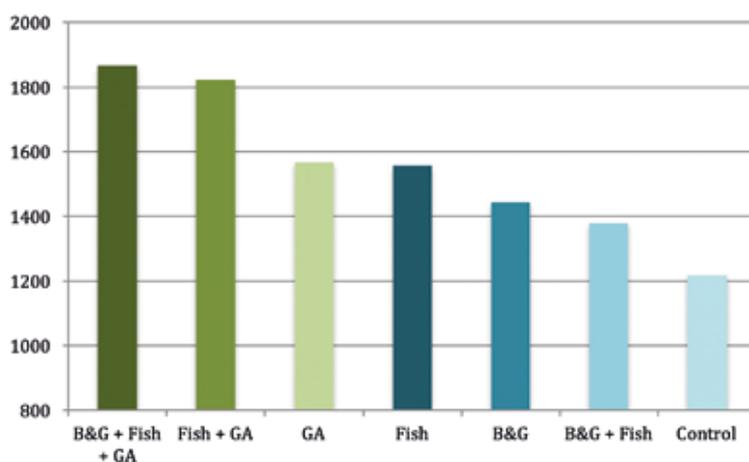
This part of the trial tested:

- Balance & Grow (Organic) (B&G)
- Gibberellic acid (GA), and
- Fish meal (as an organic source of nitrogen, replacing UAN)

The results of the organic pasture trial, mirrored the conventional pasture trial, where the combination of the three products provided not only the most dry matter production over the control, but also the greater level of protein, digestible carbohydrates and metabolisable energy.

Whilst the cost of the three products applied as a foliar is more expensive than the conventional alternative (because of the fish meal), it is still a far cheaper option than buying organically certified grain or hay.

Dry matter yield (kg/ha)



It should be noted that whilst GA is an important management tool to push winter pasture production, it can come at the expense of spring growth, as the extra growth draws on the carbohydrate reserve from within the plants root system.

Pasture trials in New Zealand have shown that the areas sprayed with GA have had more growth in winter, but generally less in spring.

If you have any questions about this trial, contact BioAg Sales and Agronomy Manager Dan Hill at dan@bioag.com.au or on 0448 453 412.

As this and other trials progress, we will continue to share the results with you.

Rice Research Australia

drill sown rice growing trial results

2016 marked the second year of trials conducted by Rice Research Australia, investigating the effect of BioAg's Soil & Seed on crop yield in drill sown rice.

- **14% yield increase**
- **\$603/ha additional return to the grower**
- **Cost of applied product \$24/ha**

The 2016 results showed a single application of BioAg's Soil & Seed applied at sowing resulted in a 14% yield increase and \$600 /ha return to the grower.

Anton Barton, Managing Director of BioAg said "these results reflect how BioAg products and programs work for conventional farming operations, by improving efficiency and sustainability".

"We achieve gains by improving the health of the soil, and therefore its ability to store and deliver nutrients in a plant available form when the plant needs them most", said Barton.

2016 is the second year that RRAPL have trialled BioAg's Soil & Seed on rice. In the 2015 trial, the Soil & Seed plots were the only plots in the trial that did not require top dressing of urea at panicle initiation. In the 2016 trial, there was sufficient nitrogen in all plots to not warrant top dressing at all.

The replicated and randomised trial was conducted at Rice Research Australia Pty Ltd (RRAPL), "Old Coree", Jerilderie NSW, and managed by Anna Jewell of RRAPL.

Plots were sown with 120 kg/ha MAP + 1% zinc and 150 kg/ha with a disk drill in October 2015. Soil & Seed was liquid injected into the soil at sowing, and the plots were individually harvested and yield data collected in April 2016. 250 kg of urea was applied pre permanent water in December 2015.

The greatest return per hectare (and per mega litre) was delivered by applying Soil & Seed at 3 L/ha.

BioAg's commercially recommended rate of application for Soil & Seed in drill sown rice in 2017 is 4 L/ha at a product cost of \$24-32/ha depending on volume.



"Trial results indicate Soil & Seed can deliver not only yield increases, but also reductions in the amount of top dressed nitrogen required"

2015 Results

- Soil & Seed treatment did not require N top dressing at PI
- Delivered a 550 kg/ha yield increase (\$220/ha yield return)

2016 is the second year of trials conducted by RRAPL using BioAg's Soil & Seed; the first series of trials were conducted in 2015.

The 2015 trials, which were also independently conducted, randomised and replicated, resulted in the Soil & Seed treatment being the only treatment that did not require top dressing of urea at panicle initiation.

For deep-water rice crops, this meant a 44% reduction in nitrogen used, and for shallow water crops, a 34% reduction.

Soil & Seed also delivered a 550 kg/ha yield increase.

The combined yield increase and nitrogen use efficiency resulted in the grower being \$238/ha better off.

About dry sown rice growing in Australia

Australia has an ideal climate for rice production and has the capacity to produce over 1 million tonnes of rice per year. Australian rice growers produce more rice per hectare than any other country, using around 50% less water.¹

There are a number of organisations (including BioAg) that are researching how to increase the returns to rice growers.

Brian Dunn, research agronomist with the NSW DPI (in conjunction with the Ricegrowers' Association and Australian Centre for International Agricultural Research) found that direct drilling, and delaying permanent watering can save rice growers around 2.5 mega litres of water per hectare when compared to traditional drill sowing, and 4.5 mega litres better than aerial sowing.²

He also found gross margins could be increased by around 59% if the water saved at this early stage was used to grow more rice.

If you are interested in growing more rice, using less water and less nitrogen, contact Robert Gill, BioAg Agronomy and Sales Manager, at robert@bioag.com.au or on 0427 247 844.

¹Ricegrowers' Association of Australia Inc, <http://www.rga.org.au/the-rice-industry.aspx>, viewed 15 August 2016.

²Emma Field, The Weekly Times, 21 January 2016, <http://www.weeklytimesnow.com.au/agribusiness/cropping/gains-in-dry-rice-method/news-story/30c38f3bee012ade21f086d9d843c951>, viewed 15 August 2016.

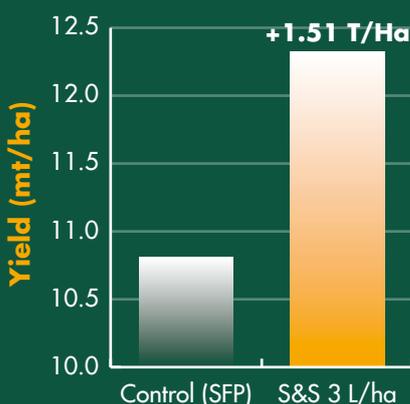


Table 1: Yield results



Table 2: Gross Margin return after deducting product, spreading, and water usage costs.

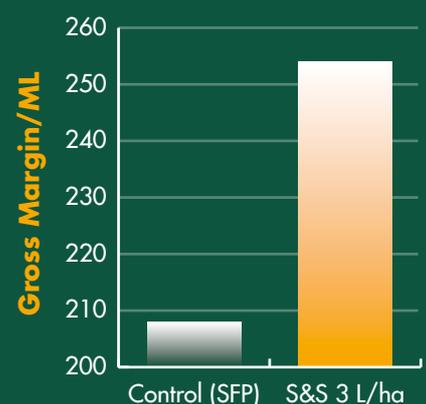


Table 3: Gross Margin return per mega litre of water used.

Introducing TWO NEW products to the BioAg range

- HydraHume™ for natural soil nutrition
- HydraFish™ an ideal source of nutrients, including nitrogen in organic systems

HydraHume™

Many growers are looking for an efficient and effective product to feed the soil, developing soil humus and soil carbon.

BioAg are pleased to now offer HydraHume, a rich source of food for the soil in a single, simple, liquid organic solution.

HydraHume helps build the soils fertility by providing a rich food source for soil microbiology.

HydraHume helps accelerate the beneficial role soil microbiology plays in the soil that ultimately benefits crops and pastures.

HydraHume works perfectly in combination with BioAg's Soil & Seed.

Soil & Seed conditions the soil, remediates poor soils, and delivers a broad spectrum of beneficial soil microbiology that assist in improving a range of soil functions such as:

- Nutrient solubilisation
- Nutrient cycling
- Nutrient accessibility
- Disease and drought resistance, and
- Residue breakdown

By using both products in combination, you receive the microbiology that work hard in your soils, and a rich source of food to help them do so.

Continued from front cover conversion (copper) and sugar movement (boron).

There are some microorganisms that use either nitrate or sulphate to breathe in anaerobic conditions. This process removes those nutrients from the soil and converts them into gaseous forms via denitrification, resulting in losses to the atmosphere.

Sulphur is critical for conversion of nitrogen into some of the amino acids. If sulphur is limited, some essential amino acids cannot be synthesised, thus compromising protein formation.

As we head towards late winter/early spring, our fertilisation program needs to be tailored to supply all of the nutrients that the plant requires to 'turn rain into grain'.

If we only focus on one nutrient, we will fall victim to 'Liebig's law of the minimum'.

Whilst nitrogen is important to increase grain yields and pasture dry matter production, it is imperative not to forget about the other nutrients the plant requires to convert sunlight into glucose and nitrogen into protein.

HydraFish™

HydraFish is an excellent and natural source of vital nutrients including nitrogen, phosphorus, potassium, calcium and trace elements that feeds soil-borne microorganisms, promoting plant growth without the risk of burning.

HydraFish can replace products like UAN as a source of nitrogen suitable for use in organic farming systems.

HydraFish is naturally high in protein, which is converted to nitrogen in well functioning soil.

HydraFish is 100% organic, and being a fine liquid, blockages in spray equipment are limited.

HydraFish is complemented by BioAg's Soil & Seed, which adds a broad spectrum of food sources and soil microbiology, and remediates poor soils.

Spring breakfast in the Riverina - Wed 28th September

BioAg would like to invite you to Spring Breakfast in the Riverina at Andrew and Kate Hawthorne's property "Uley", 4km down the Wagga Wagga Road from the Ardlethan end.

Topics for the Spring Breakfast will be:

- Barley, wheat, and canola fertiliser programs, and
- Discuss post-harvest soil testing and nutrition audits ahead of 2017.

Breakfast will be available from 7.30am,

To side step the losses associated with anaerobic soils, applying nutrients via foliar application is a useful tool to utilise in a season like this.

A strategy for some pasture fields and hay crops has been to apply some granular urea and then apply a foliar of Balance & Grow @ 2.0l/ha, Calcium Nitrate @ 5 kg/ha and when required some additional UAN @ 12l/ha.

The oaten hay crop pictured on the front cover has recently received this foliar application.

For cereal crops with spray cart access at the moment, the approach will be to apply



COMMINS ACHIEVE MORE SUCCESS IN COTTON

The management and staff of BioAg wish to congratulate Tim and Roger Commins of Commins Enterprises who won the 2016 AgriRisk High Achiever of the Year Award at the 2016 Australian Cotton Industry Awards.

Based in Whitton, in the Murrumbidgee Irrigation Area of NSW, Roger and Tim (along with their families) have developed and manage a diverse portfolio that includes cropping, horticulture and manufacturing.

In 2015, they harvested 1,500 ha of cotton, with around 50% of that using BioAg's BioAgPhos as its main source of phosphorus.

Their 2016 award is deserved recognition of all that they have achieved.

Congratulations Tim and Roger!

with a paddock walk and talk to follow starting around 8.30. Coffee and tea will finish up the breakfast at around 10.30am.

RSVP: As breakfast will be provided, RSVP's are needed back to us by Monday 19th September.

Send your RSVP or any questions to Robert Gill, BioAg's Riverina Manager at robert@bioag.com.au, or on 0427 247 844.

A special thankyou to Andrew and Kate for making their property available for the day.

a foliar mix of Fruit & Balance @ 2 l/ha, zinc sulphate (heptahydrate) @ 300 gm/ha, copper sulphur (pentahydrate) @ 150 gm/ha, along with UAN @ 20 l/ha prior to head emergence.

Both Balance & Grow and Fruit & Balance contain many of the metabolites that the plant is struggling to naturally synthesise itself, because of the waterlogged soil conditions and reduced sunlight hours.

These include (but are not limited too) glucose, essential amino acids, auxins and cytokinanes.



Better soils. Better crops. Better stock.

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