

## Autumn 2016

### In this edition

- **Want to get the most out of your autumn?**
- **Crookwell Fertiliser Trial shows the benefit of sustained release fertiliser**
- **The Pasture Ecosystem**
- **Martin Metz joins BioAg as Chief Operating Officer**
- **BioAg expands presence in Tasmania**

# BioAg COUNTRY

## Want to get the most out of your autumn?

**Whether you're chasing grain size and quality, or wanting to grow more nutritious pasture, an autumn application of BioAg's Soil & Seed can help you get the most out of your fertiliser, land and rainfall.**

### IMPROVE YIELD AND QUALITY THROUGH:

- Improved crop establishment
- Improved plant vigour
- Improved natural soil fertility
- Improved moisture and nutrient utilisation
- Encouraging rapid germination
- Encouraging early root development

With the arrival of autumn and the cooler months, it is time to start preparing to feed your crops and pastures through their growing season.

Soil & Seed is the perfect product for crop establishment and pasture production, converting fertiliser, moisture and soil into productivity.

It does this by delivering a broad spectrum of beneficial soil microbial species, as well as a food source for both the microbial populations and the crop or pasture.

Numerous independent, replicated trials have shown the statistically significant yield increases possible with Soil & Seed. These increases include reduced nitrogen replications that have still delivered significant returns. We invite you to take a look through our trial reports which are freely available on our website.

**Healthy soils that are not farmed contain a vast population of bacteria and fungi that are necessary in the processing and delivery of nutrients and moisture into plant-life. Farming reduces the population of these micro-organisms in the soil. Soil & Seed contains both nutrients and populations of micro-organisms.**

In short, Soil & Seed revitalises the delivery system of nutrients to the plant. The entire BioAg product range contains these microbial

populations. It is what sets our products apart and why we are leaders in agricultural microbial fermentation technology.

The microbial populations perform a range of functions in the soil including

- nitrogen fixation
- soil remediation of contaminated soils
- plant growth promotion, and
- suppression of root pathogens

Soil & Seed also contains a wide variety of amino acids, which help to feed this diverse microbial community, and the entire liquid range can be applied using a boom spray, aerial, furrow injection or irrigation systems.

### WHAT DO SOIL & SEED USERS SAY? CROPPING

*"The visual difference in the crop was observable from an early stage. From the initial emergence to when the crop had started to fill, the appearance of the grain size and vigour of the crop was chalk and cheese".*

*"The ability of the treated area to resist disease pressure was visible, with noticeably less leaf disease compared to the rest of the crop, which was mainly suffering from a spot form of net blotch. With the early vigour, the weed pressure was also considerably reduced in the treated area".*

*"Visual appearance does not always correlate to an increase in yield at harvest, but we also noticed the difference once the header was in the paddock. The sizes of the heads six weeks before harvest were 30% greater than those in untreated areas. This was supported by a 1.5 tonne per ha increase in yield. For a small increase in initial costs, the rewards were great".*

**Rob Calaby, Director of Mid North Ag Services in Clare commenting on a barley cropping trial at 'Woodlands Hill' in SA.**

*"Our irrigated crops require less frequent irrigation, saving us on water".*

**Scott Vincent, Narromine NSW**

*"Ploughing the subsequent seasons paddocks occurred in a higher gear and used 20% less diesel than before".*

**Justin Walsh, Coleambally NSW**

*"My crop matured a week before anyone else's in the area".*

**George Commins, Whitton NSW**

*"Soil & Seed treated areas seem to handle the environmental stresses better".*

**Bartyn Dall, Woodlands Hill, Kybunga SA**

**Continued on back cover**

# Crookwell Fertiliser Trial

## shows the benefit of sustained release fertiliser



**Both the annual and biennial (spread every second year) applications of BioAg Superb outperform the annual application of SSP**

Since 2014, McGeechan Farm Supplies have been conducting an independent fertiliser trial in Crookwell, comparing a range of BioAg natural fertilisers and single superphosphate against a control plot.

BioAg fertilisers were trialled for both annual and biennial (every second year) applications.

The most recent cut was taken in November 2015, which showed the annual application of BioAg Superb producing the greatest amount of dry matter at 10,151 kg's.

But perhaps the most exciting outcome to date is the biennial application of Superb. This treatment is sitting not far behind in second place with dry matter production totalling 9,990 kg's., while SSP (which was applied annually) has come in third with 9,804 kg's.

### What savings can you achieve with BioAg Superb?

What sort of savings could you achieve by spreading every second year?

Spreading less often is an obvious benefit, but did you know BioAg natural fertilisers can be spread at any time of the year?

This means you can arrange transport and spreading to occur out of season, further increasing your savings.

The ability to blend with other inputs such as lime, dolomite and gypsum can also reduce spreading costs.

While the gains in production in this trial are modest (2-4%), they do show that BioAg products produce as much if not more dry matter than traditional water soluble fertilisers. These small gains applied to your entire paddocks add up.

Applying 100% bioavailable P in a non-water soluble form means you will reduce fertiliser wastage through issues such as leaching and lockup.

And finally the ability to spread a non-polluting sustained release fertiliser to all areas of your farm, including waterways means less fertiliser washes away.

So if you're looking for where the next increase in your production will come from, contact your local BioAg Area Manager on 02 6958 9911 or at sales@bioag.com.au.



Total dry matter production from Sep 14-Nov 15.



BioAg Superb being spread on pasture.

### Looking for natural sustained and balanced soil fertility?

BioAg Superb (P 9% : S 7% : Ca 31%) is part of BioAg's non-synthetic and non-polluting natural fertiliser range.

It is safe to apply to all areas of your farm; even waterways that will grass up and fight erosion. The range eliminates eutrophication and contains low levels of contaminants and heavy metals, such as cadmium.

The BioAgPhos range is root exudate, biologically soluble and soil acidity soluble, but not water-soluble. This is a more efficient form of P, as it is the water-soluble form that is highly susceptible to leaching and lock up. Instead it will remain in a 100% bioavailable

state. 100% of the P you spread will be used by your pastures in a sustained release manner.

- Blendable with lime, dolomite and gypsum to meet optimum soil nutrition requirements.
- Neutralises soil acidity without waste from over application.
- Reduced susceptibility to pestilence, and more balanced animal nutrition resulting in less metabolic disease (e.g. bloat and tetany).

To grow high quality and high mineral density food and fibre, the BioAgPhos range delivers long lasting environmentally sustainable fertility and pasture production with superior pasture nutrition per dollar invested.

# THE PASTURE ECOSYSTEM

Part 3 (Part 1 appeared in BioAg Country Spring 2015 and Part 2 appeared in BioAg Country Summer 2015).

Compiled by David Phelps  
Area Manager, Southern NSW



*As pasture-based livestock producers, we are in the business of harvesting solar energy and converting it to food & fibre. We attempt to manage plants to optimise this harvesting of solar energy via the management of the above ground portion of the pasture. However, there is more biomass & biological activity occurring beneath us than we realise.*

## Nitrogen fixation and cycling

Pasture growth is highly dependent on available nitrogen. Nitrogen fixing legumes and their symbiotic bacteria are a critical component in the pasture ecosystem. Healthy and active nodules are identified by their red interior. This colour is caused by the iron-containing red hemoglobin used as part of the nitrogen fixing system and is similar to the hemoglobin in blood. Different strains of rhizobium form symbiotic relations with different legume species. When planting legumes it is important to inoculate the seed with the bacterial strain that will become a symbiont with the legume being planted.

Nitrogen fixed by the legume and bacteria is first supplied to the legume. Therefore, in a new seeding the grass at first does not get much nitrogen from the legume. Legume nitrogen enters the soil through nitrogen rich root exudates, root and nodule death, livestock trampling, and dung and urine deposits. This nitrogen is made available to grasses and legumes as the organic matter is broken apart by the shredders and decomposed by the detritus feeders, bacteria, and fungus.

With time, the legume roots meet with mycorrhizal fungus which attaches to the root. The mycorrhizal fungus also attaches to grass roots. Then the fungus offers the clover extra phosphate in exchange for carbohydrates and nitrogen. The fungus provides part of the nitrogen to the grass from which it obtained the phosphate in exchange for carbohydrates. The fungus also obtains phosphate and trace minerals from the soil that it uses in this bartering system.

Accumulation of ammonia in the plant or high nitrate in the soil limits N fixation. Legumes preferentially use available soil N since there is a high energy cost to fixing N. Grasses are more competitive than legumes in taking up soil N due to their fibrous root systems. In soils that are high in nitrate, grasses will have increased N uptake and be more competitive with the legume. This occurs in established grass-legume pastures as the organic matter builds up and a healthy microorganism community breaks the organic matter down releasing the nitrogen and converting it to nitrate. In these pastures, grasses have a competitive advantage and the legumes may disappear. After a period of time, the soil



organic matter decreases and the available soil nitrate decreases causing the grasses to be less vigorous and the clovers come back into the system. This is one of the causes of clover cycles in pastures.

## Management thoughts needed to help the system

So what are the management practices required to help the pasture ecosystem function at its best?

1. Lime the soil to provide the pH that is optimal for plant, rhizobia, and other microbes in the soil.
2. Apply adequate but not excessive amounts of mineral or organic fertilizers to the system.
3. When seeding legumes make sure to inoculate the seed with the bacteria that will become a symbiont with the legume species being planted.
4. Manage the nutrients already on the farm. Grazing recycles nutrients in pastures. Manure management should recycle nutrients to the fields from which the feed was harvested. Manure stimulates earthworm populations and activity as well as microbial populations and activity. Organic on-farm sources of nutrients include hay, other feed wastes, manure, and bedding. Where hay is fed back on pastures, forage yields can be increased 2-fold during late spring droughts. This is due to higher soil organic matter holding additional plant available water. In wet years, yields can be 1.5 fold greater than where no hay was fed.
5. Graze pastures at the timing and intensity suitable for the forage species present. Grazing tall grass pastures to a 5 cm residual height during cool, moist weather benefits legumes and their rhizobia which fix nitrogen for all the organisms in the pasture system. Grazing too close during hot droughts can be detrimental to cool-

season grasses and legume. Do not overgraze.

6. Close, rotational grazing of pastures in the autumn helps develop tillers in the cool-season grasses and stolons on white clovers.
7. Rotationally graze pastures to get good ground cover between grazing events to provide breeding and feeding cover for night crawler earthworms. Night crawlers need adequate food and cover for reproduction especially in the cool moist weather of spring and autumn. Earthworms, like most other animals, prefer legumes over grasses for forage.
8. When choosing fly and parasite control options consider their effect on dung beetles and other dung-feeding insects and organisms.
9. When choosing weed control options consider their effect on other plants and soil microorganisms. Co-grazing livestock such as sheep and goats that convert "weeds" to marketable animal products and manure has a positive effect on the pasture ecosystem.

Above ground, we manage grasses, legumes, and forbs with animals to capture solar energy, convert solar energy into marketable livestock products, and to cycle nutrients so that our pasture-livestock system can be sustainable. The result of our management influences the soil environment and the organic matter available to feed macro- and microorganisms in the soil. This affects the soil's physical condition, availability of macro- and micronutrients to grasses, legumes, and forbs, and plant available soil moisture. Understanding how our management affects the soil community can assist us in our management of the entire pasture ecosystem.

## References:

E.B Rayburn - Pasture Ecology: Managing Things That We Cannot See: 2009  
USDA/NRCS. Soil Biology Web Site.  
[http://soils.usda.gov/sqi/concepts/soil\\_biology/biology.html](http://soils.usda.gov/sqi/concepts/soil_biology/biology.html)

## Martin Metz joins BioAg as CHIEF OPERATING OFFICER

BioAg is pleased to announce that it has secured the knowledge and experience of long time industry figure Martin Metz, who has joined the BioAg executive team in the role of Chief Operating Officer.



Qualified with a Bachelor of Chemical Engineering, Martin has over 25 years experience in the Australian and Global fertiliser industries, including executive and directors roles in fertiliser manufacture and supply, and global trading. As well as experience from senior roles in industrial chemicals manufacture and trade, and fast moving consumer goods.

Martin has been engaged to support the BioAg team in increasing uptake of BioAg's natural fertilisers and proprietary

biostimulants. BioAg intends to continue to rapidly grow its share of nutrient supply, enhancing agricultural production in Australia and around the world.

Should you wish to become part of the clean, regenerative and sustainable production programs that BioAg provides to an increasing numbers of Australia's leading producers, you're invited to contact Martin on 0408 385 197 to start the conversation with BioAg. With our accumulated science, quality people and reliable superior

products, BioAg has a lot to offer Australian agriculture. If you are not part of the BioAg supply chain ask yourself should I be?

Martin said, "I see great potential in working with BioAg and nurturing its cutting edge products and technology that are unique in today's agricultural landscape. The opportunities that BioAg products offer to agricultural production are too good to be ignored and I am pleased to join and be part of this team."

## BioAg *expands* presence in Tasmania

We here at BioAg are pleased to announce that our foot print has now expanded into Tasmania with the employment of Andrew Jack, who will be based at Launceston in the states north.

Andrew comes to BioAg with a wealth of experience in broadacre dry land and irrigated cropping, livestock, winter cereals, summer

forage and intensive pasture systems.

Andrew's experience has been largely accumulated in the Riverina in southern NSW, and from the Liverpool Plains to the New England tablelands.

Prior to this, Andrew gained farm management experience in both Tasmania and New South Wales.

Currently studying, Andrew is working towards a Diploma of Agriculture, majoring in Animal Nutrition, while he already holds an Associate Diploma in Farm Management, and is Fertcare and Agsafe accredited.

Andrew can be contacted on 0439 791 588 or via email [andrew@bioag.com.au](mailto:andrew@bioag.com.au).



### Want to get the most out of your autumn?

Continued from cover

#### PASTURE

"At Simpson in Victoria, after trying to grow grass with conventional fertilisers with little success, Soil & Seed in combination with other conventional and non-conventional fertilisers resulted in increases in dry matter production and better pasture composition (rye-grass/clover ratio). There has also been increased soil microorganisms and their biological activity in all paddocks.

This has led to the adoption of this system across the entire farm for the second year."

Independent pasture systems agronomist Robby Zeissig, who specialises in pasture and dairy management, cropping and silage.

#### SOIL & SEED'S EFFECT ON SOIL MICROBE POPULATIONS

After use, Soil & Seed improves the biomass of the soils.

The following analysis was performed by Creation Innovation Agricultural and Forestry (CIAAF) and shows the microbial biomass (kg/ha) before and after treatment with Soil & Seed.

Sample cropping and pasture programs are available from [www.bioag.com.au](http://www.bioag.com.au) or contact your local BioAg Area Manager for a program tailored to suit your individual paddock.

kg/ha

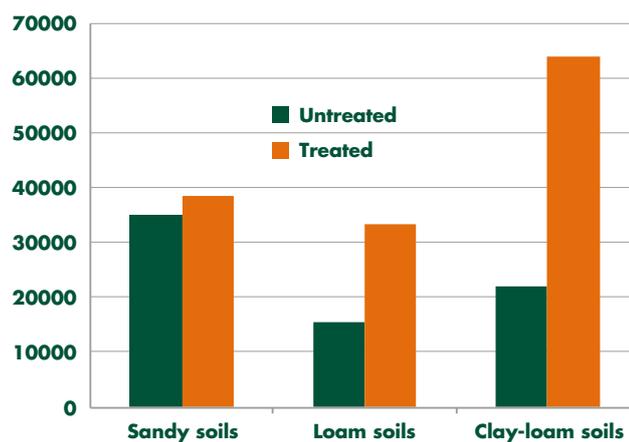


Table 1: Analysis of microbial population in various soils before and after treatment with Soil & Seed.



Better soils. Better crops. Better stock.™

For more information,  
phone 02 6958 9911 or visit [www.bioag.com.au](http://www.bioag.com.au)