



Independent Trial

Tasmania Dual Purpose Wheat Trial – 2016

Campbell Town, Tasmania Australia 2016

Location

Year

Southern Farming Systems

Wheat

Conducted by

Crop

Small plot replicated

Trial Type

Aim

To evaluate the effect of a BioAg fertiliser program on dual-purpose wheat.





Introduction

Successful farmers make the most out of every resource available to them. For some farmers, dual-purpose wheat is proving to be one of those resources.

Dual-purpose wheat is a viable option for high rainfall zones and irrigation areas, where farmers are adopting and successfully integrating it into their farming systems.

If managed correctly it can be grazed through the winter months. This allows farmers to capitalise on the strong commodity pricing for both beef and sheep, while still harvesting a crop at the end of the season.

To maximise the return on investment for a dual-purpose cereal, it is important to have:

- Healthy plants (above and below ground)
- A good tiller number per square metre
- A soil system that can deliver the required nutrients to a rapidly growing crop, post grazing.

Whilst the timing of when stock are removed, the volume of growing season rainfall and the variety of cereal planted all influence the quantity of dry matter produced and grain harvested, how nutrients are delivered and how plants access these nutrients also play a key role in the productivity of the system.

Method

A randomised, replicated plot trial was set up and completed in Campbell Town, Tasmania to evaluate a unique fertiliser regime from BioAg, compared to the standard practice for this region. A list of inputs and timings for the trial are shown in table 1.

The plots were planted on the 16th of May and were allowed to grow, without any grazing pressure until mid August. Prior to the stock being introduced a SAP analysis was completed by AgVita Pty Ltd, with a summary of the results listed in table 2. Once introduced, the stock were allowed to graze up until the 30th of August, which was the growth stage GS30.

Table 1: Treatment List

Timing	Product	BioAg treatment	Control (standard)
Pre-sowing	Lime	2.5t/ha	2.5t/ha
	<i>BioAgPhos</i>	250kg/ha	–
	<i>Soil & Seed</i>	3L/ha	–
	Urea	–	100kg/ha
At planting	DAP	75kg/ha	125kg/ha
	Seed (Revenue)	80kg/ha	80kg/ha
Prior to grazing	Tissue test	Completed	Completed
Post grazing	<i>Balance & Grow</i>	3L/ha	–
	Calcium Nitrate	15kg/ha	–
	Urea	–	200kg/ha
Flag leaf emergence	<i>Fruit & Balance</i>	2L/ha	–
	Total solid inputs	2920kg/ha	3005 (+85kg/ha)
	Total liquid inputs	8L/ha	0 (-8L/ha)

Formulations

BioAgPhos – a biologically inoculated reactive phosphate rock.

BioAg Soil & Seed – a microbial inoculant, containing a diverse range of micro-organisms and a complexed food source.

BioAg Balance & Grow – a fermented liquid culture designed to supply the plant metabolites required for vegetative growth.

BioAg Fruit & Balance – a fermented liquid culture formulated to enhance the plants natural ability to shift its reserves from vegetative to reproductive.

Table 2: SAP Analysis

	BioAg treatment	Control (standard)
Nitrogen (%)	1.77	1.82
Phosphorus (%)	0.23	0.19
Potassium (%)	1.87	1.59
Calcium (%)	0.26	0.29
Magnesium (%)	0.13	0.13

Results

The plots were harvested on the 21st of January 2017, with both a yield and grain quality assessment completed. The BioAg plots increased yield by 17% over the control being 1.2t/ha.

There was a reduction in the protein content of wheat harvested under the BioAg program, this is likely due to a combination of factors. Firstly the fact nitrogen applications were not increased to support the higher yields, and secondly that the BioAg treated crop was higher in moisture indicating it was harvested slightly early. Overall the BioAg treated crop delivered 1,045 kg of protein per hectare versus the conventional program of 970 kg of protein per hectare.

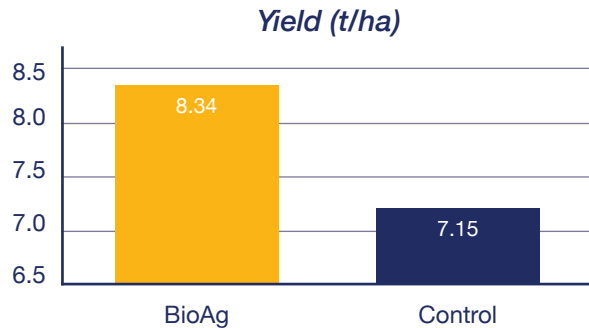


Table 3: Results

	Plants/m ²	Yield (t/ha)	Head count/m ²	Test weight (kg/ha)	Screenings (%)	Protein (%)	Moisture (%)
BioAg treatment	181.3	8.34a	689	60.6b	2.76b	12.53b	11.87a
Control	196.0	7.15b	675	64.57a	0.65a	13.57a	11.67b

Note: The results followed by a different letter indicate a statistical significance between the treatments.

Conclusion

The strategy behind the BioAg treatment was to deliver improved grazing and higher yields at harvest. The SAP analysis prior to grazing reveals no significant difference in the nutrient content of feed between the BioAg and conventional programs

The at harvest trial data highlights that the BioAg treatment produced a statistically significant yield response over the control. This was achieved from improved tillering and recovery post grazing, which can be seen in the grain head count per square metre.

It is also evident that the increased yield and lower late season nitrogen application of the BioAg treated plot has restricted the protein accumulation in the treated area, compared to the control.

Despite this the protein per hectare produced under the BioAg program was higher than the control.

The trial highlights benefits that can be achieved in dual purpose wheat when grown under a program incorporating sustained release phosphorus (*BioAgPhos*) and biostimulants (*Soil & Seed, Balance & Grow and Fruit & Balance*).



Additional Background – About BioAg

BioAg is an Australian manufacturer of liquid biostimulants and natural phosphate fertilisers. BioAg's liquid biostimulant are a range of proprietary microbial cultures, specifically formulated to support different plant growth stages by improving plant and soil performance.

Each culture / product contains a:

- Balanced food supply of carbohydrates, amino acids, enzymes, vitamins, essential nutrients and growth promoters, that feed both plants and beneficial micro-organisms
- Large and diverse population of beneficial micro-organisms, including fungi, bacteria, yeast and protozoa.

Each product has been developed to:

- Stimulate soil biology and plant processes
- Feed soil biology to ensure it is active and able to interact with the plant
- Improve the balance of beneficial microorganisms in soils, and
- Provides microbial food and microorganisms into soils that are low in microbial activity or diversity due to factors such as, stress (cold, heat or water logging), lack of plant activity (fallow) and/or due to a lack of plant diversity (monoculture).

Applying the appropriate product at the requisite growth stage will support and enhance:

- Structured vegetative growth and enhance root development
- Nutrient cycling and improved plant availability of nutrients
 - Chelation of nutrients, via amino bonds
 - Conversion of in-organic nutrients into a microbial form (becomes part of the biomass)
 - Helps to unlock nutrients previously bound in soil complexes
 - Improves the flow of nutrients through the plant
- Water retention and uptake, and
- Plant vigour and tolerance to abiotic stresses.

The benefits of biostimulants can be depleted with time. In addition, as plants develop reach their next growth stage the nutritional needs of the plant also change. Applying the appropriate biostimulant, soil inoculant or foliar application, at the right time is a key attribute of any program.

BioAg's three core biostimulant products are:

1. *Soil & Seed* is a broad-spectrum microbial inoculant that assists; nutrient accessibility, nutrient solubilisation, nutrient cycling, enhanced seed germination, root development, disease and drought resistance and residue breakdown.



2. *Balance & Grow* is a broad-spectrum source of foods and stimulants for balanced plant functions, plant health, and vegetative growth including; calcium and phosphate, vitamins, minerals, proteins, enzymes, amino acids and carbohydrates.
3. *Fruit & Balance* is formulated to increase flowering, fruit set and soil microbial activity. It delivers a rich source of plant-available phosphate when the plant is under peak load, stimulating strong fruiting and enhancing yield potential. *Fruit & Balance* contains a rich source of vitamins, minerals, proteins, enzymes, amino acids, carbohydrates, and growth promoters.

Each product is also available as an organic variant.

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