

Autumn 2017

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BioAg COUNTRY



Fourth year of corn, cotton and soybean trials completed

Cotton	+25%	Additional cotton yield using 15% less N.
Corn	+17%	Additional corn yield using full N. (+14% additional yield using 15% less N).
Soybean	+20%	Additional soybean yield.

Three BioAg products have been trialled each year since 2013 to measure their effect on corn, cotton and soybean crop yields.

The fourth year of results (2016 season) have just been received.

2016 marked the fourth year of BioAg products being trialled in corn, cotton and soybean.

The complete series of trials (2013-16) were conducted by Agricenter International and managed by their Director of Farm and Research, Bruce Kirksey PH.D. While the weather during the season made it a tough one for growing crops (especially cotton) these are still strong results.

As in previous years, the trials measured the effect of BioAg's biostimulant Soil & Seed

applied to the soil, along with the foliar **Balance & Grow** and **Fruit & Balance** that deliver plant nutrition, growth and health.

Highlights from the 2016 Trial Results

The trial had two key groups of replications:

- With the BioAg suite used in conjunction with the district standard practice (Full N).
- The BioAg suite with -1.5% N taken out of the district standard practice (1.5% less N). (Not trialled on soybean).

The complete trial reports are available at www.bioag.com.au/trials-case-studies.

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Chart 1: Average Yield Increases (%) over 4-years of trials

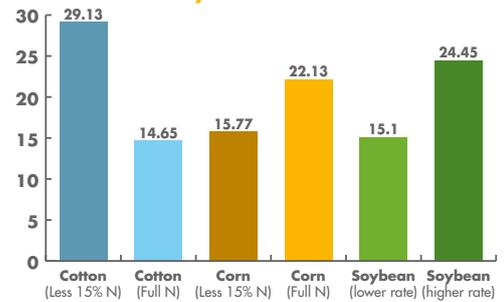


Chart 2: Four years of Cotton trial results (average yield increases) (%)



Chart 3: Four years of Corn trial results (average yield increases) (%)

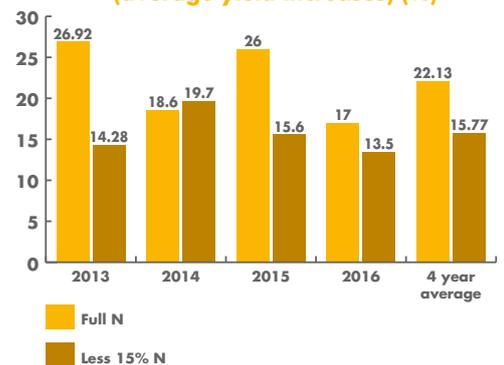


Chart 4: Four years of Soybean trial results (average yield increases) (%)



NEW PRODUCTS RELEASED by BioAg

BioAgBor™

BioAg is pleased to announce the release of four new products into Australia. For further information, talk to your BioAg distributor or Area Manager.

BioAgBor™

For sustained supply of boron

Boron is typically deficient in many Australian soils, particularly in high rainfall zones.

BioAgBor is an organic form of boron that is suited to a range of enterprises such as horticulture, pastures and field crops.

In BioAgBor, we have a unique form of boron (hydroboricite) that will not readily leach. BioAgBor provides continuous availability of boron that will be accessed as borax and sodium borates, and used by the plant over extended periods.

BioAgSOP™

For chloride sensitive crops and high sulphur demand crops

BioAgSOP is an organically certified, granular form of concentrated potassium sulphate fertiliser that is immediately available to the plant in soluble forms.

Containing no chloride, it has a low salt index, making BioAgSOP perfect for chloride sensitive crops such as fruits, vegetables, and grapes.

BioAgSOP™

Being a good source of sulphur, it is ideal for crops with a high sulphur demand. The high sulphur content improves nitrogen use efficiency and positively effects yield and fruit quality.

Potassium plays a vital role in:

- Photosynthesis
- Starch accumulation
- Protein synthesis
- Controlling ionic balance within the plant
- Metabolism of carbohydrates
- Disease suppression
- Improving the plant's ability to withstand both drought and frost tolerance

BioAg CuZin™ and BioAg Zinc™

Address and prevent copper and/or zinc deficiencies

Delivers the added benefits of sulphur

BioAg Cuzin is a fertiliser solution of zinc, copper and sulphur, while BioAg Zinc is a zinc and sulphur solution.

Each is ideal for use in a range of farming enterprises, especially when addressing and preventing zinc and copper deficiencies.

CuZin™

Each product provides the added benefits from its sulphate content.

BioAg CuZin and BioAg Zinc are free flowing and non-settling liquid fertilisers that are 100% solution.

Being in highly available liquid forms, uptake to the plant occurs quickly allowing for the fast correction of deficiencies. We highly recommended applying the appropriate product variant before a deficiency occurs.



They are suitable for use in grains, horticulture, pastures and vines, and can be applied through foliar application or fertigation, or sprayed directly onto soils.

BioAg CuZin contains zinc as sulphate (110 g/l), copper as sulphate (40 g/l) and sulphur as sulphate (70 g/l). BioAg Zinc contains zinc as zinc sulphate (165 g/l) and sulphur as sulphate (78 g/l).

BioAg CuZin sample

CROOKWELL FERTILISER TRIAL

The McGeechan Farm Supplies/BioAg fertiliser trial is now into its third year and the latest harvest results follow. The trial, based near Crookwell (NSW) has had 15 cuts taken so far, with the most recent cut occurring in January 2017.

The aim of this fully replicated trial (4 reps) is to compare the dry matter production of various BioAg fertilisers and rates, and single superphosphate. The trial also investigates how well biennial applications (applied every second year) of BioAg fertilisers compare against annual applications of water-soluble fertilisers.

Results Discussion (2014-Jan 17)

+ 500 kg/ha	Additional dry matter production grown by Superb (annual application) over SSP (annual application).
13/15	Superb has produced the most dry matter in 13 out of the 15 cuts taken since May 2014.

Superb (at the annual rate) has consistently produced the most dry matter production since month 7 of the trial. There was very little difference between the Superb (annual application rate), SSP (annual application rate), and Superb (biennial/applied every second year rate) until this point.

Superb (applied every second year) has consistently produced more dry matter than the annual application of SSP since month 18 of the trial.

What we have witnessed is, the longer the trial has run, the better Superb's performance has been. This is put down to the sustained release of nutrient delivered by Superb, and the gradual breakdown

(digestion and delivery in a plant available form) of that nutrient by the biological digesting agent added by BioAg. Production from the nil treatment continues to drop off quickly.

If you don't spread annually

One of the aims of this trial was to test the production obtained from spreading Superb at a biennial rate (every second year).

This section of the trial was designed to benefit pastoralists in marginal country who may only spread on some paddocks periodically. The chart below compares the benefits of spreading

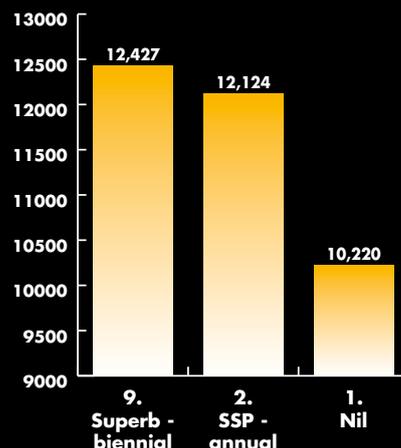


Chart 1: The benefits of biennial spreading versus annual SSP and doing nothing.

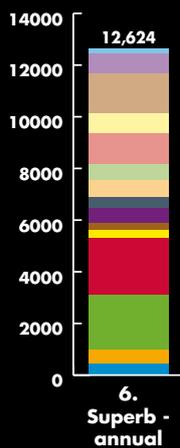


Chart 2: Total d...

BioAg Liquids Deliver in 2016 Crops



Jon's barley crop, captured in September 2016.



Wheat crop coming into the Spring of 2016.

Jon and Kerrie Hacker run a mixed cropping operation at Summerhope in Muckadilla (40km west of Roma, QLD). In 2016 they grew wheat, barley and chickpeas. Jon also conducted his own trials on wheat, where he added the foliar Balance & Grow to the mix.

Wheat	Wheat Trial
4.5 t/ha Prime Hard	+17% yield increase (+1/2 t/ha)
Barley	Chickpeas
4.5 t/ha	2.5 t/ha

Wheat - 4.5 t/ha Prime Hard

Jon took the photo (above) of his wheat crop at the end of August 2016.

The flag leaves measured 22mm in width, and the crop was entering Spring with a full profile. The inputs for this crop were 25 kg/ha MAP based starter fertiliser and 3 l/ha of BioAg Soil & Seed.

The end result for this crop was a 4.5 t/ha yield of Prime Hard quality wheat.

Wheat Trials

- +17% yield increase
- Additional earnings \$76/ha
- ROI 73%

Jon dedicated a section of his farm to conducting his own trial on wheat. In the trial he added 2 l/ha of BioAg Balance & Grow to the existing protocol of 25 kg/ha MAP based starter fertiliser and 3 l/ha BioAg Soil & Seed.

By adding the 2 l/ha of Balance & Grow, Jon was able to increase his crop yield on average by 1/2 t/ha, a 17% yield increase.

Jon provided a cost breakdown for the trial. The on-farm price for this wheat was \$180/ha, with a gross profit of \$90. The cost of the Balance & Grow treatment was \$12/ha, with an extra harvest cost of \$2/ha.

The net result was an additional \$76/ha

in profit by adding Balance & Grow to his fertiliser protocol. This represents a return on investment of 73%.

Barley

This photo of Jon's barley crop in head was taken on 18th September 2016.

Jon's inputs for his barley was 3 l/ha of Soil & Seed, furrow injected at sowing.

The end result, the barley yielded 4.5 t/ha, which would have made malt if a malting variety had been sown.

Now that he knows it is possible, Jon intends to grow a malting variety in the coming season.

Chickpeas

Chickpeas were Jon's most profitable crops. Again, Jon used 3 l/ha of Soil & Seed, furrow injected at sowing time.

The early-planted paddock yielded 2.5 t/ha. Jon also had a paddock that was late-planted (a month later), which still yielded 2 t/ha.

Superb at a biennial rate, versus SSP at the annual rate and doing nothing (control).

What we have learned from this trial so far

1. The best performing replications in this trial were those that had sulphur applied. The difference between BioAgPhos and Superb is essentially the addition of sulphur to Suberb. Sulphur is important for maintaining good pasture production.
2. There is little benefit in choosing a fast release (water soluble) form of nutrient in pasture production. SSP produced marginally more

dry matter production in just two of the 15 cuts taken to date. Both of these instances were early on in the trial. The trial highlighted that the additional growth from SSP when compared to the sustained release nutrient from Superb was small and short-lived.

3. Spreading at a biennial rate (every second year) is not only possible, but also profitable.

Please contact James Fraser at McGeechan Farm Supplies or David Phelps (BioAg: on 0438 269 939) if you wish to have a look over the trial or discuss results to date.

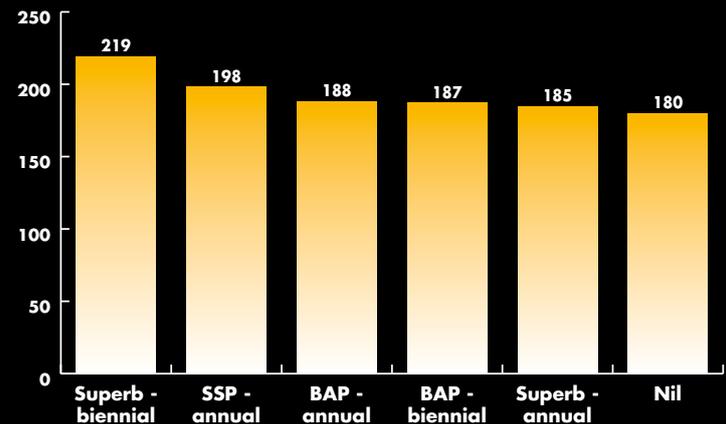
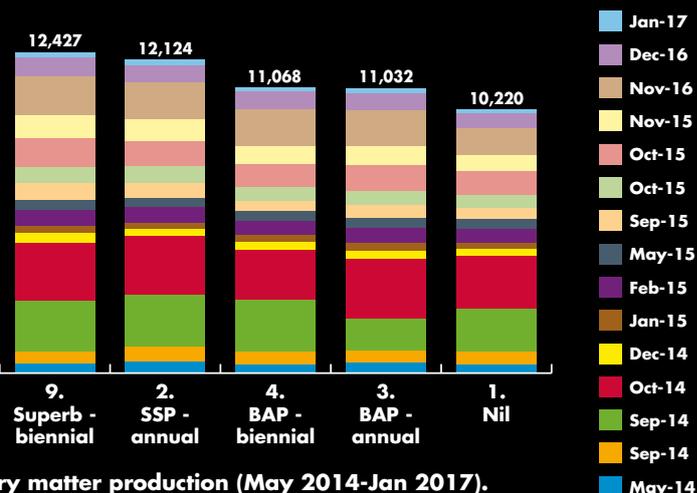


Chart 3: Dry matter production from cut 15 (Jan 2017).

Colin Falls' Observations from 2016 Season

• Wheat, barley, canola

Colin, together with his son Jacko, owns and operates an agglomeration of properties around Dingee, north of Bendigo in Victoria's Loddon Valley.

Colin observes that 2016 was a great year for production. In fact dryland yields were approaching what are yields coming from irrigated crops in normal years.

In terms of yield, wheat averaged 5.5 t/ha with quality mostly APW and H2.

Interestingly yield and quality were both noticeably lower from leased paddocks. Most of this grain only made ASW. This deficit is put down to a lack of fertility, conditioning with lime and gypsum, and history of BioAg nutrition programs.

Colin observed that it takes a few years to get soil structure and nutrient status to optimum levels.

Barley yield averaged 6 t/ha with 85% of it making malting grade.

Canola averaged 2.5 t/ha although large areas were drowned. **Where the crop was not water damaged, yields of 3-3.2 t/ha were the norm.**

Colin observed that given the wet year with a large spring canopy, fungal leaf diseases (including rust in wheat and net blotch in barley) were expected. Agronomists were advocating preventative fungicide use in anticipation of disease outbreaks. Colin left his crops largely unprotected and was very

excited with the minimal amounts of fungal disease that he had to contend with.

Most of Colin's grain has been stored on farm in silos and silo bags for marketing over the next quarter.

Colin's major challenge through the growing season in 2016 was to meet the needed nutrient demand for the entirety of the season. Given profile and anticipated moisture it was important to not overcook crops, but at the same time ensure that nutrient levels were not limiting production potential.

Colin's next major challenge for 2017 is to replace nutrients used up in grain and stubble production, along with those removed in floodwater or lock up.

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Optimising Nitrogen Usage

Enhanced nitrogen use efficiency is an outcome that BioAg have delivered to customers across a wide range of soil and crop types.

The trends in these trials clearly demonstrate this phenomenon. Optimised nitrogen use reduces the amount of N lost to the environment, such as greenhouse gas emissions and losses to waterways.

Cotton

Cotton responded extremely well to the BioAg suite used in conjunction with reduced nitrogen inputs. The most plausible reason for this is that the nutrient environment allowed the plant to hold its fruit-load through to harvest.

Corn

For most years, corn responded better when using the BioAg suite in conjunction with the district standard amount of N, however with the four-year average using less N producing 16% additional yield, it is clear that there is still an excellent response after reducing the N inputs.

Soybean – the more the merrier

The soybean reps were not tested against reduced N inputs, as nitrogen fertiliser is not used. Instead, we chose to test soybean against varied rates of BioAg Soil & Seed, a lower rate of input, and a higher one.

What was clear from this is the more BioAg Soil & Seed used on soybean, the better the yield response is. These types of reps are valuable tools that BioAg use to develop standard rates that not only deliver yield increases but also value for money to the grower.

There was no real way of knowing how well the suite of products, made in Australia and designed for Australian soils would perform under U.S. conditions, especially against the standard practices for the area which have already been scrutinised and improved over many years. However submitting BioAg's biostimulants and yield enhancing suite of liquids to independent trial in the U.S. was important.

Four years of statistically significant and large yield responses has demonstrated the efficacy and validated the science behind BioAg products. This allows advisors to recommend, and growers to use BioAg products with complete confidence.

These trial results, along with the library of results achieved across a variety of crops in Australia and the Indian sub-continent prove that BioAg adds value to agricultural production across a vast array of soils and crop types around the world.

The science is sound; the results are second to none. The opportunity for growers to do better with BioAg awaits them.

What have we learned from the trials?

Growers with large scale farming operations in Australia have already experienced the great results that have been highlighted in these trials.

What BioAg has benefitted from in conducting these trials includes:

- (i) We have seen how well the products perform under US conditions (weather and soils)
- (ii) We have seen how much we can improve the yield response of some of the best fertiliser programs in the world
- (iii) We have increased our scientific body of evidence that shows how well these products work

One of the most important take-away's from these trials is the yield response achieved after reducing the nitrogen inputs.

Using less N, and combined with additional yield responses can amount to much greater profits for Aussie growers. Something we hope to highlight to our existing and new customers in the coming year.

The corn, cotton and soybean trials will occur again in 2017.



Better soils. Better crops. Better stock.™

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