

Breeza Cotton Cropping Trial 2012

Breeza, NSW	2012
Location	Year
Tamworth Rural (CRT)	Cotton
Conducted by	Crop

Randomised complete block

Trial Type

Trial Outline

This trial was conducted over a 5ha area at 'Gowangardi' near Breeza in NSW. The trial aim was to evaluate the effectiveness of BioAg bio-stimulants for improving the growth and subsequent yield of irrigated cotton.



The Site

The paddock chosen was expected to show deficiencies in zinc and phosphorus, and also exhibit nutrient tie-up as a result of sodic subsoils.

The section of the paddock in which the trial was sited was chosen for its evenness of soil type. Soil tests were taken (0–10cm and 0–60cm), indicating very low nitrogen, phosphorus and zinc levels. In addition, the test highlighted sodicity in the surface and subsurface of the soils.

Each trial was designed as a randomised complete block design. Random measurements were taken at 0DAT, 7DAT, 45DAT, Squaring, Flowering, Harvest and soil tests are to be conducted post-harvest.

Location Breeza Plain, NSW: 31° 07'55.65" S 150°24'47.44" E
Sowing date 6th October 2011
Sowing rate 12kg/ha
Crop type Sicot 71 BRF
Seeding equipment John Deere Max Emerge 100cm row spacing

Table 1: Rainfall

July '11	Aug	Sept	Oct	Nov	Dec	Jan '12	Feb	Mar	April	May	Jun
1.4	29	84	57	152	74	113	159	29	23	25	91

Table 2: Fertiliser Treatment Details

	Treatment	Pre-plant	Planting	1st Flower	1st Boll	Boll Fill
Control	Tam Rural Starter		90kg/ha			
	NH ³	20kg/ha		80kg/ha		
	Clearstart	15L/ha			10L/ha	10L/ha
	Clearstart				25L/ha	
BioAg	<i>BioAgPhos</i>	300kg/ha				
	Sulphate of Ammonia	400kg/ha				
	<i>Soil & Seed</i>	5L/ha	7L/ha			
	<i>Balance & Grow</i>			5L/ha		
	<i>Fruit & Balance</i>				5L/ha	5L/ha
	Zn So4	2L/ha				
	MAP		70kg/ha			

Early Season Crop Vigour

There was a significant difference in post planting vigour between BioAg and the control.

Leaf Area Index was 12% higher in the BioAg plot.

There was also an 8% difference in plant height four weeks post planting.

It was a particularly cold start to the season with 12 cold shock days in the month after planting.



Flowering and Boll Fill

By Mid-January, the vigour difference has swapped in favour of the conventional treatment.

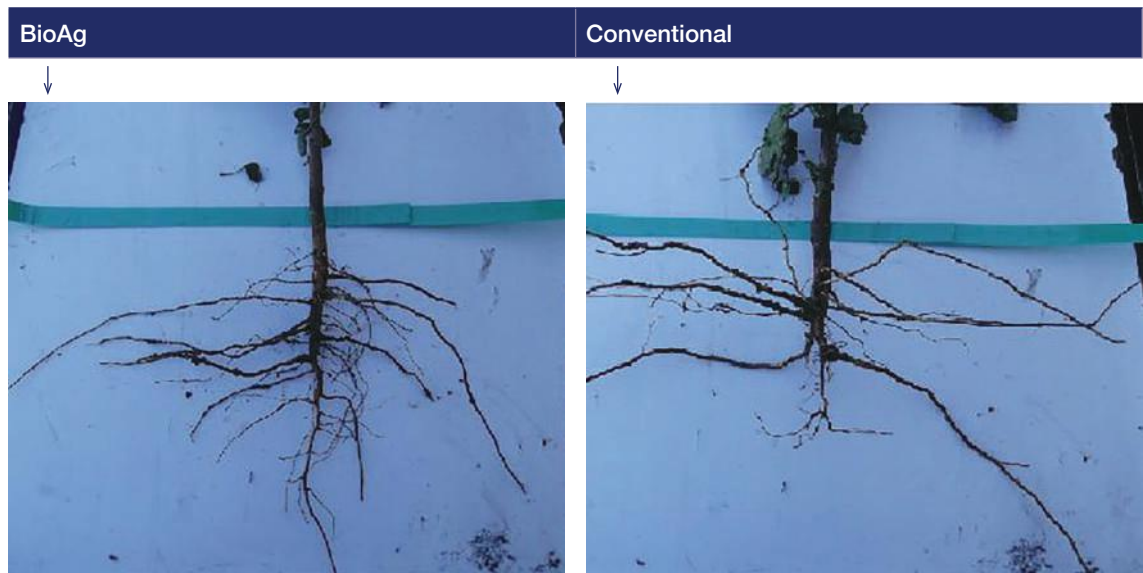
The BioAg plot plants were more compact, with reduced node spacing.

Leaf Area Index was similar, the square and boll counts were higher in the BioAg plots.

There was less vegetative growth on the BioAg plants, however the root system was more developed.



Early Season Root Development



Greater root biomass - more fine roots

Greater rooting depth - no fert 'avoidance' zone

Fruit Load and Maturity At Last Effective Flower (LEF)



There was on average, one extra boll per plant counted at LEF (24/2/12). Given there was an established 12 plants/m row, this would equate to a theoretical yield advantage of 0.33 bale per acre.

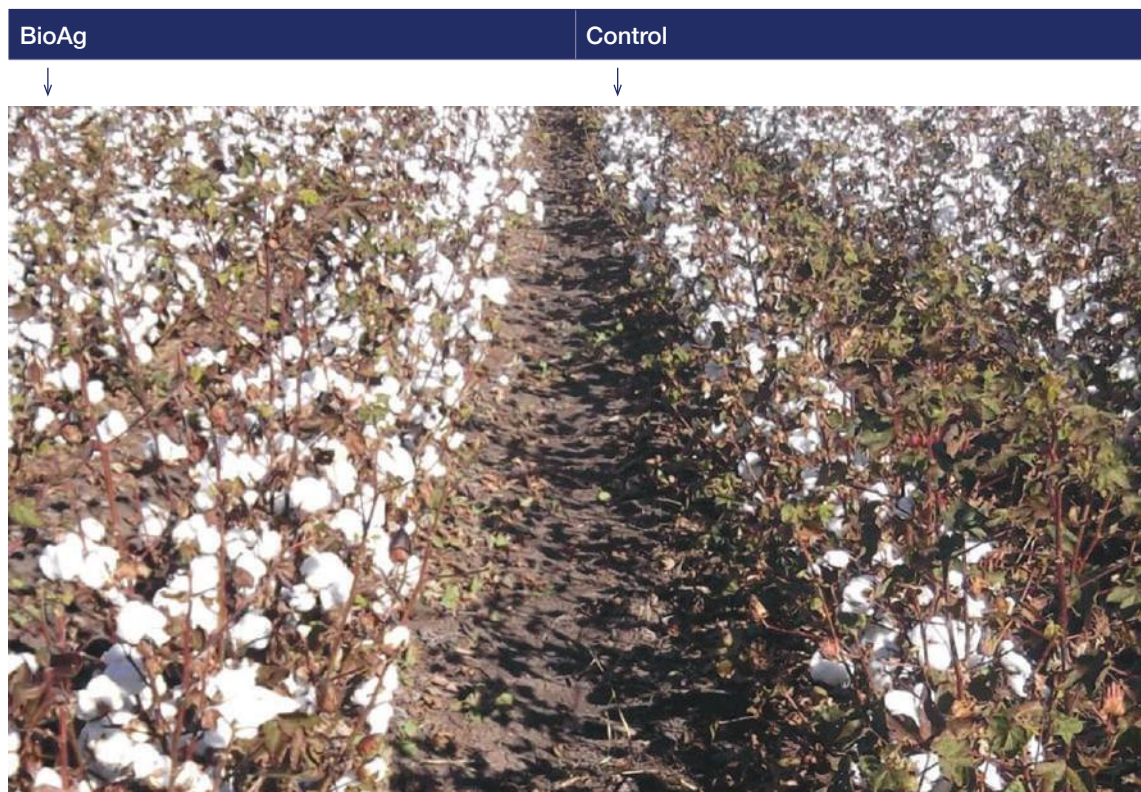
Average boll weight was also 15% higher at this assessment point. There appeared to be less incidence of 'Parrot Beak' in 2nd position fruit in the BioAg plot.

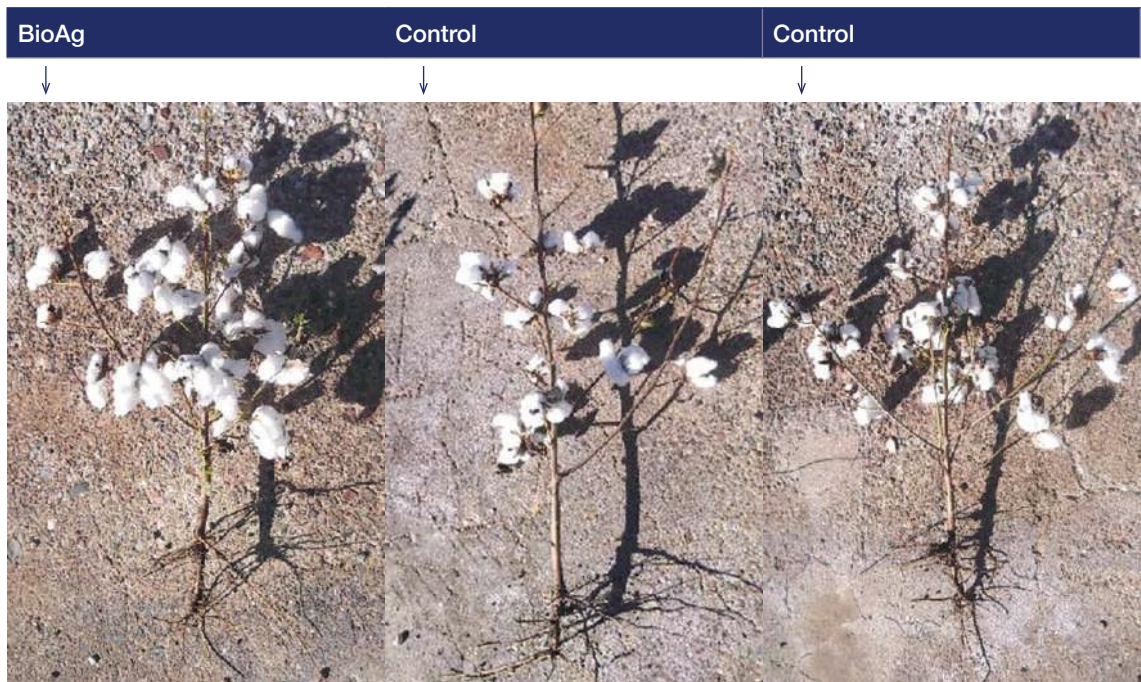
Defoliation and Maturity

The BioAg area was more mature at defoliation time and there was less vegetative growth.

Due to the 5ha plot size it was not practical to defoliate the BioAg plot separately.

If this would have been possible, the BioAg cotton may have been defoliated 8-10 days prior to the conventional treatment.





The BioAg treatment appeared to produce more compact crop with less vegetative growth that matured earlier.

The reduction in rank growth saw an improved defoliation result in an area where defoliation can be an issue due to cold conditions.

Seasonal Conditions

Pre-Season

The combination of lower than average winter rainfall, however adequate weed control and a long fallow period provided a 'full profile' of moisture prior to planting the trial.

Post-Planting

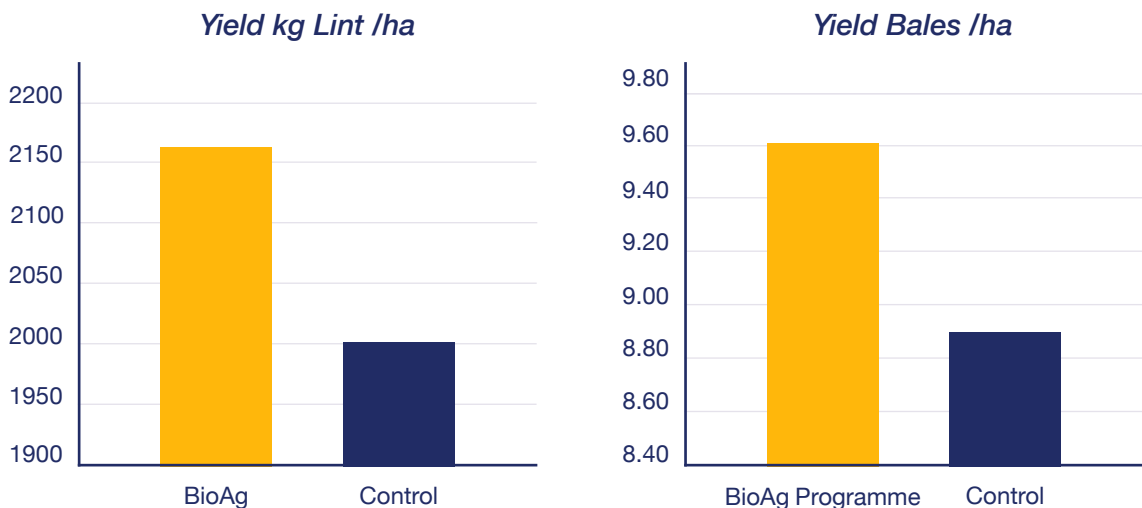
Continued rainfall provided a good start for early crop growth and development. There were 27 cold shock days in the first four months and, this combined with a wet November delayed the date of the first flower until the first week in January.

Pre/Post Flowering

January also received a substantial amount of rainfall, causing some waterlogging and the necessity to apply late season N in the form of Easy N.



Harvest & Yield



The BioAg treatment produced an 8% yield increase.

In addition there was the increased maturity, meaning defoliation could have taken place earlier.

Conclusion

The trial highlighted that the BioAg treatment promoted early growth and vigour over a conventional program incorporating Clearstart.

In time the plants under the conventional program exhibited increased vigour, however the BioAg treated plants retained a more extensive root system.

In relation to harvest and yield the BioAg treated crop matured earlier and could have been defoliated earlier. In addition it produced an 8% increase in yield.

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.