GROWER RESEARCH TRIAL

Proving Profitability and Sustainability: Digestor Delivers in Cotton

AIM & PROTOCOL

Sundown Pastoral Company, a family-owned and operated Australian agricultural enterprise established in 1964, is recognised for its large-scale cotton production, regenerative farming practices, and commitment to environmental stewardship. Sundown developed Good Earth Cotton, the world's first carbon-positive, fully traceable cotton brand. Sundown and Metagen collaborated on a cotton field trial at Keytah, Moree NSW in 2024/25 to evaluate the efficacy of Metagen's biostimulant, Digestor, in enhancing soil health, with a particular focus on improving nutrient use efficiency and building disease-suppressive soils in cotton production systems. In 2024, fertiliser accounted for 33% of emissions in the Keytah irrigated cotton farming system.

The trial was conducted as a replicated strip-trial, comparing the grower's standard fertiliser program to a reduced fertiliser program with the addition of Digestor at 5L/ha. Treatments were as follows:

1. Yellow- Standard Program 260 units N/ha
2. Blue- Reduced Fertiliser 130 units N/ha + Digestor
3. Green- Reduced Fertiliser 80 units N/ha + Digestor

KEY FINDINGS

- **In-crop Measurements:** The Digestor treatments resulted in shorter plants, that contained more bolls. A significant rain event late in the season lead to below expected yields across all treatments.
- **Yield & ROI:** Yields were statistically similar across treatments, but Digestor treatments delivered higher returns due to reduced fertiliser costs.
- **Carbon Footprint:** Digestor treatments halved Scope 1 emissions due to lower fertiliser use.
- **Disease Incidence:** Post-harvest stem cuts showed lower Fusarium/Verticillium infection in Digestor strips (11–17%) compared with control (19%).
- **Nutrient Monitoring:** Petiole N and K stayed within optimal range across all treatments. Digestor plots finished with higher C:N ratios, CEC, and elevated phosphorus (Green treatment).
- **Soil Health:** DNA-based assessments conducted by the Metagen lab indicated Digestor treatments increased beneficial microbes, nutrient cycling capacity, and pest suppression potential compared to the control (see Figure 1).

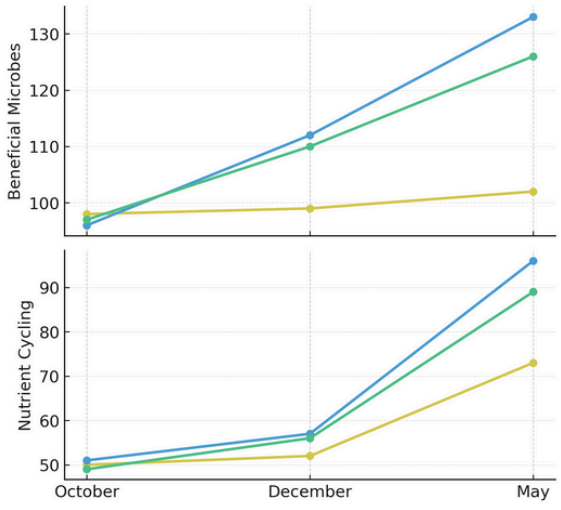

Figure 1. Sum of relative abundance of beneficial microbes and nutrient-cycling microbes over three timepoints: pre-plant, mid-crop and post-harvest. Lines are coloured according to treatment.

Table 1. Crop Monitoring data from the 21st February 2025 conducted by the grower.

Trt	Plants / metre	Fruit Counts per metre							Est. Yield	
		Plant Height	cm / node	Total Nodes	NAWF	No. Plts/m	Squares	Bolls	b/ha	b/ac
Control Yellow	12.1	101	3	23	0	16.1	1	93	11.3	4.59
Digestor Blue	11	97	3	24	3	14.6	3	106	13.1	5.3
Digestor Green	10.6	97	2.5	25	0	14.1	3	102	15.6	6.32

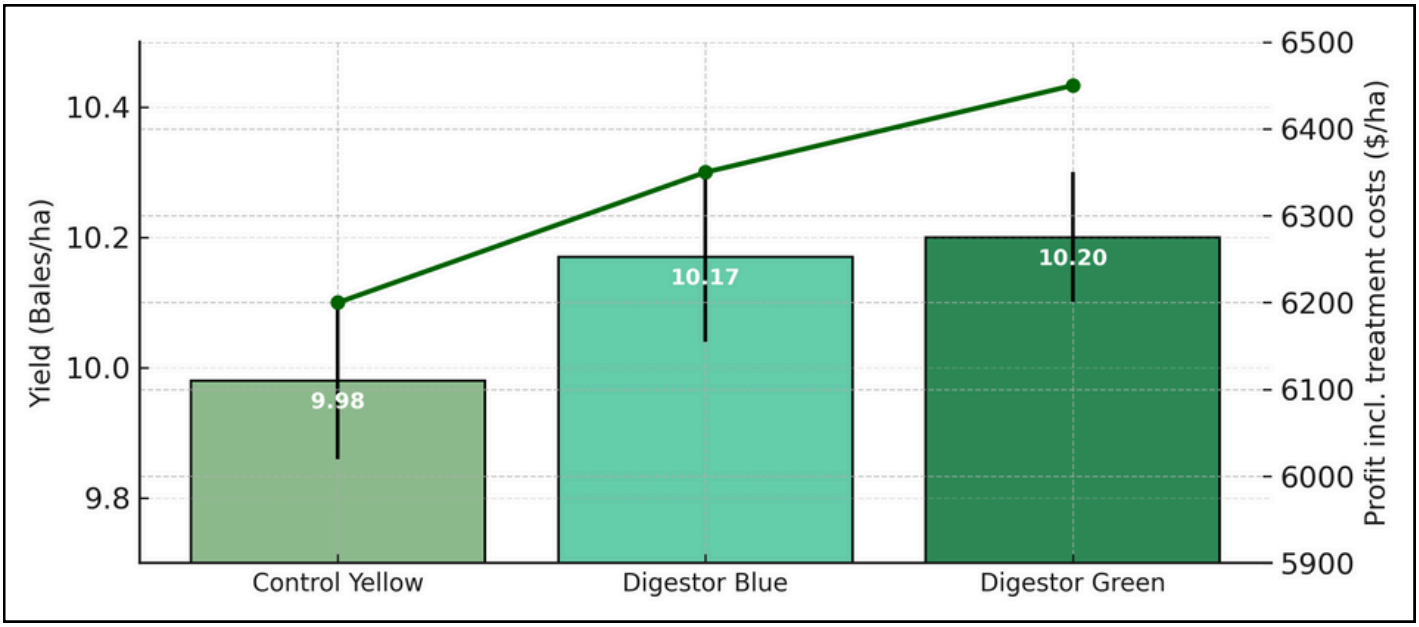

Figure 2. Yield results from the trial showed no significant difference between the three treatments. The means of the three treatments were as follows Control (yellow) 9.98 bales/ha, Digestor (blue) 10.17 bales/ha, and Digestor (green) 10.2 bales/ha. Due to substantial fertiliser savings, the additional return per hectare for the Digestor treatments was $169.09 (blue) and $297.90 (green) when compared to the control treatment. This was calculated with an added Digestor product cost of $125 per hectare.

Image courtesy of Sundown Pastoral Company- Keytah.

For detailed trial results and more information, contact:
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