

## Langleys Bio-Energetic™ technology

- The Next Generation microbial blend
- for both Conventional and Regenerative Farming Systems

### This Case Study -

1. The Biomineral grower achieved the maximum potential yield and water use efficiency for bananas.
2. This occurred using 82% less Nitrogen and 83% less Potassium when compared with the conventional grower.
3. These results optimize the profitability of banana production and can be attributed to:
  - the controlled release Nitrogen format of the Troforté fertiliser;
  - increasing the mineral content of the soil;
  - introduction of the Bio-Energetic Microbe Blend.
4. The Biomineral production system can be further optimised and applied to a wide range of crops and pastures.



Langleys Bio-Energetic Microbes **P.1**

Case Study - Banana Program **P.1**

Results and Conclusion **P.2**

## Comparing Biomineral vs Conventional Systems in Sub-tropical Banana Production.

Report by PJ. Storer (FL Tech) and S. Brain (Field Capacity)

### Aim :

To compare the productivity and performance of banana production under Biomineral and Conventional systems in Carnarvon, Western Australia.

### Background:

A comparison of the agronomic and economic performance of the Biomineral production system and Conventional practice was conducted on two growers' properties in the Carnarvon horticultural area.

The Biomineral production system comprised of the following inputs:

- 200kg/ha of Troforté Cropping Plus fertiliser applied quarterly;
- 1kg/ha of Langleys Bio-energetic™ Microbe Blend injected into the irrigation system quarterly.

The Conventional fertiliser program implemented by the grower consisted of:

- 960kg/ha Urea constantly injected during irrigation;
- 300kg/ha Potassium Sulphate constantly injected during irrigation.

The nutrient content of the two systems compared with the recommended Best Management Practice (BMP) are presented in Table 1.



Typical example of Trial banana crop grown with Biomineral fertiliser + BMB microbes

**Table 1: Comparative Nutrient Content of the Programs.**

	Nitrogen (kg/ha)	Phosphorus (kg/ha)	Potassium (kg/ha)
<b>Biomineral</b>	80	56	36
<b>Conventional</b>	440	0	210
<b>BMP**</b>	285	80	662

\*\*Best Management Practice

**Table 2: Soil and Leaf Sodium Levels - Bananas.**

Parameter	Level Detected	Desired Range
Exchangeable Sodium (mg/kg)	483	15 - 120
Exchangeable Sodium (%)	10	0.5 - 6.0
Electrical Conductivity (dS/m)	0.928	0.025 - 0.15
Leaf Sodium (%)	0.006	0.03 - 0.10

**Table 3: Biomineral Soil and Leaf Potassium Levels.**

Parameter	Biomineral	Desired Range
Soil Exchangeable Potassium (mg/kg)	1031	200-400
Leaf Potassium (%)	4.21	3.1-4.0

**Table 4: Economic Assessment of Biomineral and Conventional Production.**

	Biomineral	Conventional
<b>Yield (t/ha)</b>	78	37
<b>Cartons</b>	6,000	2,846
<b>Income (\$/ha)</b>	\$166,299	\$78,867
<b>Operating Costs (\$/ha)</b>	\$52,489	\$52,255
<b>Packing Costs (\$/ha)</b>	\$37,500	\$17,788
<b>Gross Margin (\$/ha)</b>	\$76,310	\$88,23
<b>Profit/kg</b>	\$0.98	\$0.25
<b>Profit/carton</b>	\$12.72	\$3.28
<b>Water Use Efficiency (kg/kl)</b>	3.25	1.54

## Summary of Findings:

According to the results of leaf tissue analysis, both systems were able to adequately meet nutritional requirements of bananas.

Although the soil at the Biomineral site was sodic, the plants did not demonstrate excessive sodium uptake (Table 2), even though gypsum was not applied.

Despite the Biomineral program only applying a low rate of Potassium when compared with a Conventional system, plant uptake was optimised as presented in Table 3.

The Biomineral grower achieved a yield of 78 t/ha - which is the maximum potential yield according to water use efficiency benchmarks. The conventional grower achieved a yield of 37 t/ha which is close to the accepted district average for Carnarvon.

The efficiency gains achieved under the Biomineral system contributed to twice the amount of income for the same operating costs - and therefore much greater profitability as presented in Table 4.

## Take Home Message:

- The Biomineral production system using Troforté Cropping Plus combined with Langleys Bio-Energetic™ Microbe blend has the capability to:
  - Meet plant nutritional requirements in adverse soil conditions;
  - Support the achievement of maximum potential yield;
  - Contribute to optimised nutrient and water use efficiency;
  - Maximise profitability.