

Langleys Bio-Energetic™ technology

- The Next Generation Seed Coating Inoculum
- for use in both Conventional and Regenerative Farming Systems

This Trial -

1. uses Langleys Bio-Energetic™ technology to:
 - inoculate wheat seeds with a multi-strain suite of energized beneficial microbes;
2. Results show increased plant performance:
 - increased Yield;
 - increased nutrient density and quality;
 - increased Gross Margins and Profitability.
3. Can be used in Conventional or Regenerative programs.

Fertiliser Applied Units /ha

Conventional -

(8.2N,9.6P,9K,4.8S+Cu+Zn)
+ Post Liq-N (12.7N)

Biomineral -

(8N,5.4P,3.6K+3.7S+TE's)
+ Post Liq-N (12.7N);



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

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

Results and Conclusion **P.2**

Comparing Bio-Energetic Seed Coating Technology on Conventional and Regenerative Systems in Wheat.

Report by PJ. Storer, S. Brain and H. Strydom

Aim :

A field trial was conducted in Pingelly to evaluate Langleys Bio-Energetic™ Microbe blend (BMB) seed coating technology on a Conventional program (+/- BMB microbes) and a Troforté Biomineral fertiliser program (+/- BMB microbes).

Case Study: Wheat Trial

Mace wheat seed were sown at 80kg/ha (minimum till). The seeds were either treated with –

1. Bio-Energetic Microbes(+ BMB); or
2. No Microbes.

Fertiliser regime applied –

1. Conventional K-Till Extra Fertiliser @80kg/ha;
 - + Post UAN 30L/ha
2. Troforté NPK Biomineral Fertiliser @80kg/ha;
 - + Post UAN 30L/ha
3. Control (No fertiliser, No microbes).

The Conventional (+BMB) and Biomineral (+BMB) treated plants *had no fungicide treatments* and had no *disease issues*. Control, Conventional (No Microbes) and Biomineral (No Microbes) were treated with fungicides (seed dressing and foliar).

Herbicides were applied to all treatments –

- 1.5 L/ha Roundup,
- Pre-em 118 g/ha Sakura; and
- Post-em 2 L/ha Boxer Gold.

Wheat (+/-) BMB microbe trial



(L) Conventional + BMB; (R) Conventional No Microbes

This seed coating system uses Langleys Bio-Energetic™ technology aimed at enhancing soil health and the plants ability to more efficiently extract nitrogen, phosphate and mineral nutrients.

Summary of Trial Results

(sample of data presented on Pg 2):

In both the Conventional and Biomineral programs the application of **Bio-Energetic™ Microbe blend** as a seed dressing showed significant increases:

- Grain mineral nutrient uptake (Table 1);
- Protein %, Hectolitre Weight and less screenings (Table 2);
- Yield, and Gross Margins (Table 3).

Table 1 – Grain Nutrient Analysis

| Treatment | Nitrogen % | Phosphorus % | Potassium % | Sulfur % | Calcium % | Mg % | Sodium % | Copper mg/kg | Zinc mg/kg | Mn mg/kg | Iron mg/kg | Boron mg/kg | Moly mg/kg | Cobalt mg/kg | Silicon mg/kg |
|--------------------------|------------|--------------|-------------|----------|-----------|------|----------|--------------|------------|----------|------------|-------------|------------|--------------|---------------|
| Control | 1.44 | 0.15 | 0.41 | 0.13 | 0.04 | 0.09 | <0.01 | 1.0 | 6.9 | 20 | 31 | 2.1 | <0.5 | <0.1 | 298 |
| Conventional + BMB | 1.59 | 0.20 | 0.45 | 0.14 | 0.05 | 0.11 | <0.01 | 1.2 | 7.8 | 26 | 37 | 2.9 | <0.5 | <0.1 | 339 |
| Conventional No Microbes | 1.55 | 0.18 | 0.47 | 0.13 | 0.04 | 0.10 | <0.01 | 1.1 | 7.1 | 24 | 33 | 2.5 | <0.5 | <0.1 | 312 |
| Biominerals + BMB | 1.57 | 0.21 | 0.48 | 0.13 | 0.05 | 0.13 | <0.01 | 1.4 | 8.2 | 32 | 39 | 3.2 | <0.5 | <0.1 | 394 |
| Biominerals No Microbes | 1.54 | 0.17 | 0.45 | 0.13 | 0.05 | 0.12 | <0.01 | 1.2 | 7.4 | 28 | 35 | 2.7 | <0.5 | <0.1 | 375 |

Table 2 – Grain Quality

| | Control Nil Fertiliser No Microbes | Conventional 80kg/ha NPK program No Microbes | Conventional 80kg/ha NPK program + BMB Microbes | Biominerals 80kg/ha Program No Microbes | Biominerals 80kg/ha Program + BMB Microbes |
|---------------------------|------------------------------------|----------------------------------------------|-------------------------------------------------|-----------------------------------------|--------------------------------------------|
| Protein (%) | 10.6 | 11.4 | 12.1 | 11.2 | 11.7 |
| Hectolitre Weight (kg/hL) | 76.1 | 76.8 | 78.2 | 77.8 | 78.9 |
| Screenings (%) | 4.7 | 6.2 | 4.4 | 4.7 | 4.2 |

Table 3 – Yield, Total Costs of Production and Gross Margins

| | Control Nil Fertiliser No Microbes | Conventional 80kg/ha NPK program No Microbes | Conventional 80kg/ha NPK program + BMB Microbes | Biominerals 80kg/ha Program No Microbes | Biominerals 80kg/ha Program + BMB Microbes |
|----------------------------------------------------------------|------------------------------------|----------------------------------------------|-------------------------------------------------|-----------------------------------------|--------------------------------------------|
| Yield per ha | 0.99 t/ha | 1.65 t/ha | 1.87 t/ha | 1.54 t/ha | 1.91 t/ha |
| Farm Operating Income (per ha) <i>(@ APW1 \$ per tonne)</i> | \$301.95 <i>\$305.00 ***</i> | \$503.25 <i>\$305.00 ***</i> | \$570.35 <i>\$305.00 ***</i> | \$469.70 <i>\$305.00 ***</i> | \$582.55 <i>\$305.00 ***</i> |
| Total Input Expenses (\$ per ha) * | \$24.48 per ha | \$108.34 per ha | \$106.09 per ha | \$97.05 per ha | \$98.65 per ha |
| Total Contractor Costs ** | \$109.50 per ha | \$119.00 per ha | \$112.50 per ha | \$112.50 per ha | \$112.50 per ha |
| Total Costs \$ per ha (Inputs + Contractor) | \$133.98 per ha | \$227.34 per ha | \$218.59 per ha | \$209.55 per ha | \$211.15 per ha |
| Crop Gross Margin (per ha) | \$167.97 per ha | \$275.91 per ha | \$351.76 per ha | \$260.15 per ha | \$371.40 per ha |
| What is the change from Control? | | | | | |
| - Change in Gross Margin Before Tax (\$/ha) | \$0.00 | \$107.94 | \$183.79 | \$92.18 | \$203.43 |
| - % Change in Gross Margin Before Tax | 0.00% | 64.26% | 109.42% | 54.88% | 121.11% |

* Input Costs (includes Knockdown, Pre- and Post- Em herbicides, seed treatments, fertilisers, Post-N etc)

** Contractor Costs (includes cost of application of herbicides and fungicides, air-seeding, post- N application, harvesting etc)

*** Based upon 2020 Pricing APW1 \$305/t

Highlights

Conventional program -

(No microbes) = 1.65t/ha and \$275.91 Gross Margin
 (+BMB microbes) = 1.87t/ha and \$351.76 Gross Margin
 = +13.3% Yield and +27.5% Gross Margin

Troforté Biomineral fertiliser program (+/- BMB microbes) –

(No microbes) = 1.54t/ha and \$260.15 Gross Margin
 (+BMB microbes) = 1.91t/ha and \$371.40 Gross Margin
 = +24.0% Yield and +42.7% Gross Margin

Take Home Message:

- Application of **Langleys Bio-Energetic™ Microbe blend** as a seed dressing in cereal crops has great potential:
 - It has been successfully used on both Conventional and Regenerative Farming systems;
 - Compared to Control and No microbe treatments -
 - Both Conventional (+ BMB) and Biomineral (+ BMB) showed improved plant performance, grain quality and nutrient density, yield and ultimately increased profitability.