CUSTOMER FORMULATED FERTILISER DEMONSTRATION TRIAL

Chris O'Callaghan, Research & Development Co-ordinator, Liebe Group

AIM

The purpose of this trial is to determine if there are benefits from applications of a biological based product developed by Basic Environmental Systems and Technology (B.E.S.T) namely 'Customer Formulated Fertiliser' (CFF).

BACKGROUND

The amount of organic matter in a soil (measured as organic carbon) is often used as an indicator of the potential sustainability of a system. Soil organic matter plays a key role in nutrient cycling and can help improve soil structure (Pluske *et al*, 2007).

Carbon makes up approximately 50% and nitrogen 0.5 to 10% (dependent on residue type) of the molecules in organic matter; some of which turns over rapidly (labile fraction) and is available to plants, whilst other more recalcitrant forms contribute to the stable (passive, slow turnover fractions) organic matter pools (Pluske *et al*, 2007).

Although significant amounts of organic carbon are present in soils, some of this is relatively inert. Soil organic matter is made up of different pools which vary in their turnover time or rate of decomposition. The labile pool which turns over relatively rapidly (< 5 years), results from the addition of fresh residues such as plant roots and living organisms, whilst resistant residues which are physically or chemically protected are slower to turn over (20-40 years). The protected humus and charcoal components make up the stable soil organic matter pool which can take hundreds to thousands of years to turnover (Murphy *et al,* 2007).

Soil microorganisms mineralise organic matter to obtain carbon, nitrogen and other nutrients for their own metabolism and growth (Murphy *et al,* 2007). Management practices influence microbial activity by altering carbon availability and conditions reflecting rapid changes in the biological function of the soil (Murphy *et al,* 2007).

Microbial activity is measured by carbon dioxide evolution and reflects a range of biological processes in the soil. This is dependent on soil moisture, temperature and labile carbon (Murphy *et al,* 2007).

The application of suitable food substrates (carbon) and/or introduction of beneficial microorganisms to soils is largely untested but provides an opportunity to identify alternate strategies to enhance crop production and possibly contribute to longer term soil health.

Customer Formulated Fertiliser (CFF) is a product developed by Basic Environmental Systems and Technology (B.E.S.T). BEST describe CFF as a 'biostimulant' which they claim aims to feed and increase the population of beneficial micro organisms in the soil.

TRIAL DETAILS

Property	Stuart & Leanne McAlpine, west Buntine
Plot size & replication	200m x 12m x 5 replications
Soil type	Sandy loam
Sowing date	3/7/07
Seeding rate	60 kg/ha Wyalkatchem
Fertiliser (kg/ha)	3/7/07: 50 kg/ha Macropro plus 3/7/07: 250 mL/ha BEST CFF on Seed (only on non-control plots) 8/8/07: 250 mL/ha BEST CFF as Foliar Spray (only on non-control plots)
Paddock rotation	2005 = Lupins, 2006 = Wheat
Herbicides	3/7/07: 0.8 L/ha Glyphosate, 1.1 L/ha Triflur X, 0.3 kg/ha Diuron, 25 mL/ha Hammer 8/8/07: 350 mL/ha LVE MCPA, 350 mL/ha Tigrex
Growing Season Rainfall	127mm

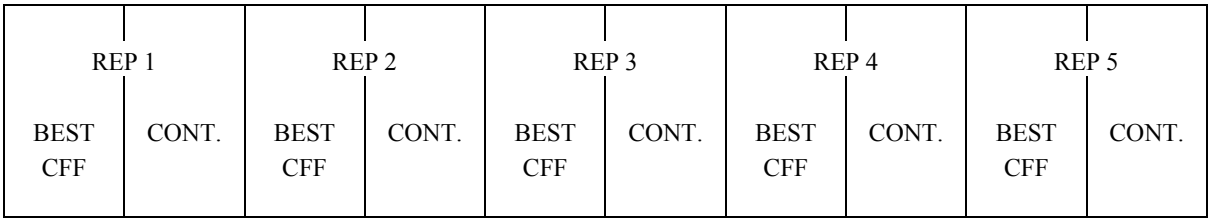

Figure 1: Trial Layout indicating position Customer Formulated Fertiliser and control treatments at West Buntine.

RESULTS

Table 1: Yield, quality and gross margin of Wyalkatchem wheat grown with and without the application of TM21 (Customer Formulated fertilizer).

Treatment	Yield (t/ha)	Protein (%)	Screenings (%)	Weight (g)	Gross Return ($/ha)	Variable Costs ($/ha)	Gross Margin ($/ha)
Control	0.46	13.12	1.99	408.36	194.58	119.11	75.47
BEST CFF	0.55	13.2	1.65	409.22	232.62	144.11	88.51
LSD (P=0.05)	n.s						

Based on EPR for 20/12/07 APW Base Price $423/tonne. Variable cost obtained from Farm Budget Guide (*Farm Weekly*).

COMMENTS

There was no statistically significant difference between the control and the CFF treated plots (Table 1). Through visual observation it was noted that radish numbers and Rhizoctonia incidence was lower in the CFF treatment plots, however further studies need to be conducted in this area to accurately determine the effect of CFF on disease and weed levels.

The average yields were used in the economic analysis and at these yield levels it proved $13/ha more beneficial applying 2 applications of CFF at $12.50 per application (Table 1). It must be noted however there was high variation between replicates and future demonstrations will need a radomised plot design.

The dry conditions experienced in 2007 impacted on this demonstration which indicated a need for further research into the effectiveness of this product in a more favourable season.

REFERENCES

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Pluske, W, Murphy, D, Sheppard, J. (2007) 'Organic Carbon Factsheet', Website: www.soilquality.org.au/fact_sheets/organic_carbon.pdf

PAPER REVIEWED BY: DR DANIEL MURPHY

CONTACT

Chris O'Callaghan
Ph. 99568555
Email. liebe.chris@bigpond.com