Liquid Fish Nutrient On-farm Demonstrations 2013

Blackwood Basin Group

This demonstration assessed the possible benefits of applying fish hydrolysate sprayed at a rate of 5L/ha onto canola and wheat stubble to determine impacts on stubble breakdown, how it affects the availability of nutrients and whether it imparts any animal feeding preference. Four demonstration farmers from Qualeup, Shire of Kojonup, participated in the project that was coordinate by the Blackwood Basin Group in collaboration with South West Catchments Council and Agronomica.

Product characteristics

Typical Analysis of Natural 'superfine' Liquid Fish Nutrients:

Nitrogen	2.5
Phosphorus	0.30%
Potassium	0.25%
Calcium	0.5%;
Fat and oil approx.	4.0%;
pH	3.6 - 3.8;
Salt (NCAL)	<0.36%

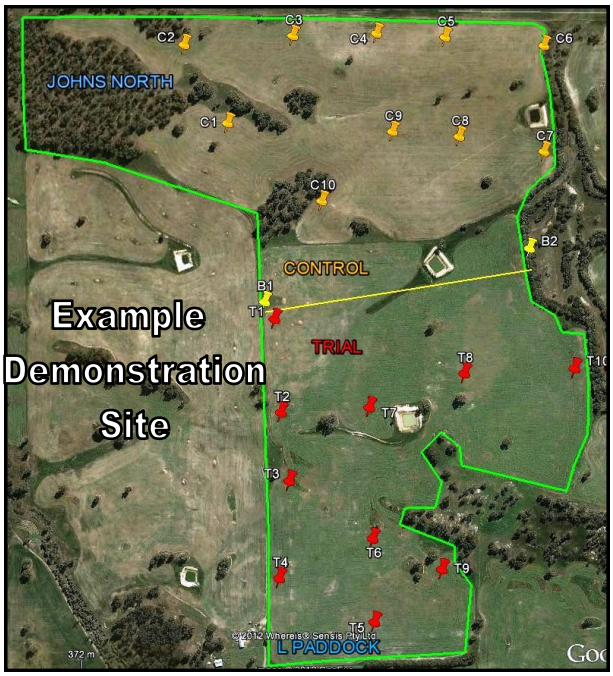
Standing cereal stubbles can be difficult to breakdown, and without sufficient decomposition, stubble can hinder the next seeding program in a number of ways.

There are a number of reasons stubbles may not breakdown efficiently, including:

- Wide carbon to nitrogen ratio (C:N) – about 100:1;
- Lack of intimate contact with the soil; and
- Lack of moisture.

Grain stubble is also low in animal nutrition; while there may be several tonnes of dry plant material per hectare available, it has been reported that sheep grazing stubbles only ingest about six per cent of this[1]. Stem material is only 29% digestible but makes up about half of the total stubble[2]. This project set out to assess an option to achieve more rapid breakdown of stubbles into a useful form of organic matter with the provision of beneficial nutrients.

http://www.agric.wa.gov.au/objtwr/imported_assets/content/past/sheep performance on cereal and canola stubbles.pdf



How did we test it?

4 properties sprayed 5L/ha of fish hydrolysate onto approximately 50 ha of standing wheat or canola stubble after harvest. Similar sized areas were not sprayed and were used as the "controls". Farmers stocked paddocks for various times and at different stocking densities. One farmer used a mechanical stubble-cruncher on canola stubble.

What was measured?

Soil samples and photographs were taken from designated GPS locations in each treatment and control plot prior to the product application and again after 10 weeks. The samples were analysed for soil chemistry; (trace elements, soil nutrients, pH and EC) soil microbial diversity and different measurements of soil carbon.

SWCC south west catchments council

This project is supported by the South West Catchments Council, through funding from the Australian Government's Caring for our Country and the Government of Western Australia.

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Summary of Data Analysis Results

What was found?

⇒ Soil nutrients such as nitrogen, phosphorous, potassium and calcium increased in the treatment sites. Generally phosphorus and calcium declined in the controls and nitrogen increased. Sulphur increased in all sites.

⇒ The increase in soil Colwell phosphorous in the 3 treatment sites was about 11ppm. There's something else happening here.

⇒ Walkley Black total organic carbon testing suggested greater carbon levels in 3 of the 4 treatment sites and generally lower or similar levels in 3 of the 4 control sites.

⇒ One site had increased carbon levels in both the control and treatment sites. Although untested this is likely the result of increased particulate organic matter fractions from the residue being "crunched".

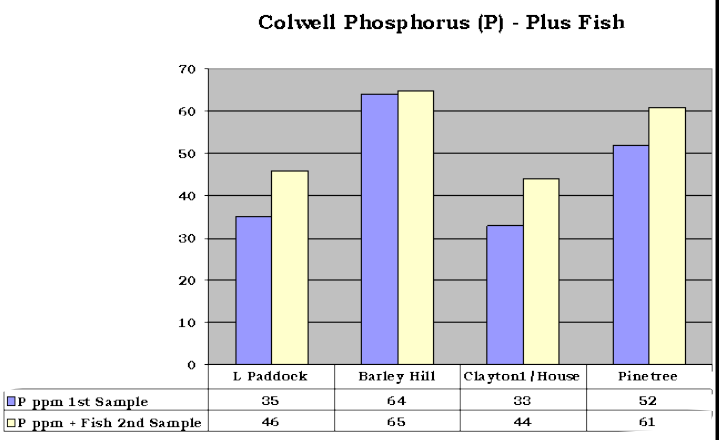
⇒ Leco total organic carbon testing showed greater carbon levels in 3 of the 4 treatment sites and lower levels in 3 of the 4 control sites.

⇒ Generally the percentage of labile carbon (very available microbial food) to total organic carbon remained similar from the first sampling across both the treatments and controls highlighting the lack of organic matter breakdown to the more labile fraction which was expected after only 10 weeks.

⇒ Soil biological diversity associated with the breakdown of stubble (Actinobacteria) increased across all sites.

⇒ One farmer reported a distinct difference in animal preference for trial area stubble.

⇒ One farmer "crunched" the stubble in both treatment and control after 6 weeks. The results from these paddocks were the most consistent of the three properties.



Where to from here?

From this short term demonstration, there seems to be enough positive differences where the product was applied to follow up with more research into the application of fish hydrolysate onto stubble to assess its impacts on stubble breakdown, availability of nutrients and maintaining or improving some components of soil carbon. Many more questions have been raised than answered, however such a simple option needs to be further explored. It seems that there is very little research into ways of improving stubble breakdown using organic inputs such as fish and most of the focus has been on mechanical means of knocking down or incorporating stubble to improve the soil/stubble contact, which is a vital factor for successful microbial breakdown. **Using fish as an adjunct to other stubble management options appears promising.**

For more information, please contact the Blackwood Basin Group on 9765 1555 or email bbg1@westnet.com.au

Data Analysis provided by Deb Archdeacon, Agronomica.