

Benefits of life in soil

KAROLIN MacGREGOR

SOIL biology is becoming an increasing focus for Tasmanian farmers. Last week about 40 farmers gathered at Deloraine for the *Understanding Soil Biology* workshop, organised by agriculture company Macquarie Franklin. The guest speaker was soil biology expert Joel

Williams, of BioLife Agriculture.

Mr Williams said soil biology was an area of research that had not received much attention until recent years.

Now, however, increasing input costs and more emphasis on sustainable farming had raised farmers' interests in improving soil biology.

He said one of the keys to soil biology was achieving the right balance between the different organisms in the soil food web.

Mr Williams said for most crops, a balance between bacteria and fungi was needed for successful and productive cropping.

Unfortunately, many modern farming practices tended to favour bacteria,

which often created an environment more favourable for weeds to grow.

"Cultivation is a big issue because microbes don't like being cultivated or turned on their heads," Mr Williams said.

Some of the benefits of no-till farming techniques included an improvement in soil structure; soil organic carbon levels also increased earthworms and invertebrate activity.

Mr Williams said studies had shown that no-till methods also increased the surface horizon carbon levels while tillage distributed carbon more evenly through the soil profile.

One of the biggest drawbacks of tillage was its effect on soil structure. "There is not a single method of cultivation that improves soil aggregation," Mr Williams said.

"Soil aggregation is of utmost importance to soil health and biology." Despite the positives, Mr Williams said some creative solutions would be needed to overcome the practical issues of no-till farming.

One of those was a higher reliance on herbicides to

players in this system," he said. "Most of our agricultural soils, though, are bacteria-dominated."

Mycorrhiza fungi, in particular, are essential for carbon sequestration because they produce a sticky sugar-like protein called glomalin which can resist degradation for up to 40 years.

Mr Williams said it was vital that before making any decisions about their cropping system, farmers asked themselves what impact those practices would have on soil biological health.

While he is passionate about soil biology, Mr Williams told the workshop that the best practices for the soil were sometimes not realistically feasible in many farming systems.

He said to avoid long-term impacts on soil biology, farmers should try to offset practices or inputs that might reduce soil biology with other practices that promoted biology.

"To each action there is an equal and opposite reaction - that is just as relevant to agriculture as it is to physics," he said.

Some of the inputs that

Advertisement



Australian Government

How will the banking reforms benefit you?

The first reform is the ban on mortgage exit fees on new loans from 1 July 2011

- ✓ Increased competition makes it easier to switch to a better deal
- ✓ The reforms enable more financial choices
- ✓ Lending institutions hiding unfair fees can be fined
- ✓ Some lending institutions have removed fees on existing contracts



The Australian Government is making changes to the banking system to make it fairer and more competitive. So talk to your lending institution today and start looking around, you have plenty of choices.

For more information about the reforms visit:

australia.gov.au/bankingreforms



Authorised by the Australian Government, Capital Hill, Canberra



SOIL BIOLOGIST: BioLife Agriculture's Joel Williams.

achieve weed and crop control, which could increase toxicity and reduce availability of nutrients in the soil.

He said using chemicals such as glyphosate could also change the balance of the soil food web composition.

"We have to use chemicals sparingly and responsibly," he said.

Some of the biggest impacts on soil biology, however, were environmental factors such as temperature, moisture and habitat. Mr Williams said poor composition of stubble and crop residues could indicate there was an unhealthy soil food web or that it was unbalanced.

He said the use of animal and green manures could help restore balance.

Soil biology is also essential for carbon sequestration. Mr Williams told farmers at the workshop that there was four times more carbon stored in the soil than in plant bio-mass.

Fungi were more important for carbon sequestration than bacteria. "Fungi are really key

could assist in boosting soil biology. Inputs include humate or brown coal, humic acid, fulvic acid, seaweed extracts and liquid fish products.

Green manures could also play an important role in improving soil biology, along with compost and compost teas.

When dealing with compost, Mr Williams said it was vital to remember that is was a live product that needed to be treated carefully.

"Good-quality compost should be teeming with beneficial microbes," he said. "It's the life in the compost that makes it all happen."

Whatever system farmers use, Mr Williams said it made sense to get soils working as effectively as possible.

This would often not only improve production but could cut down on the need for inputs as well.

"A lot of people don't realise how much life there is in soils and once you get that all in balance and working for you, it's amazing how effective it can

DORR/C4