

# Every farmer needs a microscope

*If you think it's easier to send soil tests away and get someone else to tell you what's going on with your soil, think again. If what Helen says doesn't encourage you to get a microscope and start studying the soil yourself, nothing will. You might also want to get one for your kids too.*

 **Helen Disler**



Every farmer needs a microscope. I recently made this statement in a conversation with a farmer who is new to biological farming. We were discussing the pros and cons of buying compost and he wanted my advice. My concern was that he had no way of knowing whether the compost he wanted to buy was any good.

I had only just spoken with someone who had completed a microscope course. He is over the moon that he can now know for himself whether the compost he makes is good for making compost tea. Furthermore he is now able to check that the compost brew has the right balance of live organisms. Lastly because he also has a camera attached to his microscope he can send a photo of the slide to a laboratory to check his results.

As a child I had a microscope. I still have it. It's basic, but it provided me a world like no other. I remember we'd put in soil, food, plants, dead insects – anything that would fit between the glass! I was fascinated as it revealed a totally different view and understanding of common objects. So I was very pleased to see, when we were driving back from filming soil microbiologist Dr Elaine Ingham at Lismore, a sign on a shop: Microscope Classes for Children. At the back of the shop was a fully qualified nematologist holding after-school classes for children. They loved it! Why? It's another world far away from modern electronics that allows one to delve deep into the wonderful world of nature. As anyone who has stared down the lens of a microscope knows, many hours can pass lost in a completely different world. I find it hard to think of a better way to introduce young people to understanding the intricate and delicate balance of nature.

## **How do microscopes benefit farming?**

Increasingly farmers are using microscopes to discover this hitherto unknown magical world and clubs are starting up in farming areas as farmers

become more scientific. Colin Seis is a member of the Mudgee Microscope Club and the father of pasture cropping. On ABC's *Landline* he said, "A group like the microscope club is important in understanding how and why different sustainable farming techniques are effective. A group like this that is looking at soils is the key to all of this. As we get healthier soils and functioning soils we seriously can droughtproof our properties."

Once a month the group meets with their microscopes and soil samples to see if their attempts at improving their soil biology have been effective.

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Agpath founder and director of the Soil Foodweb Institute Australia, Dr Mary Cole, holds microscope courses for farmers. She says, "Having access to even a simple microscope allows anyone interested in biological farming to be able to actually see the individual microscopic organisms. These organisms utilise the nutrients that then make them available to the plant."

To the experienced eye a healthy soil has a balance of the right organisms. A farmer can use a microscope to create and maintain a functioning soil by monitoring some of the tiny creatures you can see in the diagram below.


A friend of mine spent hundreds of dollars importing a biological input on his property. When he looked at it under a microscope he found, contrary to his expectations, that it didn't have any live organisms in it.

Last year over 90 farmers had a unique opportunity to look inside the soil food web through a \$30,000 microscope during a dryland dairy field day at Simpson, Victoria. The chance to see the likes of fungal feeding nematodes up close under the high magnification of the microscope was a strong attraction. Simpson dairy farmers Rob Methven and James Guy were among those to look and to tour the farm's effluent system, feed pad area and compost system.

Rob said the microscope had opened his eyes to the intricate nature of the soil. "We've got to be open to new ideas so it's important for us to know how soils work," he said. "Urea isn't working as well for me as it used to so I need to look at other options." James told local newspaper *The Standard*, "We need to open up the nutrients in the soil instead of it being locked in the ground."

Maria from Gippsland Pasturefed Meat uses a microscope about four times a year to test soil and compost fertility. She wants to know if it has a good quota of worms, beneficial bacteria, mycorrhizal and saprophytic fungi, nematodes, flagellates, amoebae and ciliates.

"We went through a lot of hassles trying to work out which microscope to get. We needed a certain magnification and the one that was recommended through a course was way too expensive at \$2000 so we ended up searching the internet and getting one from overseas for \$900."

The most basic microscope you need to work with on the farm needs a magnification of 10x, 20x and 40x. If you have more money to spend it is ideal to get magnification of 4x and 100x oil. You need an adjustable light source and stage (platform) and preferably 10x eyepieces. You're well advised to go to one of the many microscope courses on offer. 

*Helen Disler is co-founder of Farming Secrets, a company committed to farmers achieving results without chemicals, growing nutrient rich foods and being profitable, happy and healthy. 1800 600 466, helen@farmingsecrets.com*