

Rock on top

makes for better pasture and broadacre crops

NEW FINDINGS FROM A PHD student in Western Australia could help organic beef and broadacre producers improve their pasture management by tapping more effectively into microbes.

Research conducted by Jennifer Carson, of the University of Western Australia, has helped prove that rock fertilisers – which can be used in organic systems as a source of phosphorus (P) and potassium (K) – may affect plant growth indirectly by affecting the structure of microbial life below.

“We found that where fine particles of

rock fertilisers had been applied, there was a noticeable change in the type, and an increase in diversity, of micro-organisms present in the soil,” Ms Carson says.

Her results – based on the observation of silicate mineral and fine particle rock phosphate applications in glasshouse experiments with pastures – have helped dispel the belief that rock fertilisers are an inert option to conventional applications.

This is good news for organic livestock or broadacre producers who need a cost-effective answer to build their soil’s microbial populations.

“One of the biggest benefits of having a high level of micro-organisms in soil stems from their ability to break down organic matter and allow plants to access nutrients,” Ms Carson says.

“This is particularly important in WA (where trials were conducted) given the low level of nutrients in our soils. Soil microbes help in converting nitrogen in organic matter into a form that can be taken up by plants. Microbes also have a positive effect on soil structure – they produce a sticky substance which can help bond the soil together.”

Micro-organisms have been identified as having a central role in almost all aspects of nitrogen availability, with some bacteria able to convert N₂ gas from the atmosphere into ammonia (available to plants) and others able to release nitrogen in organic matter for reuse by other organisms.

Ms Carson says though the subject needs more research, it is possible diversity in microbial life can help to create healthy soils. “The thinking is if you have a lot of different micro-organisms in soil, some members of the microbial community will be able to function actively even when soil is disturbed by various management practices.”

She says while micro-organisms are typically stimulated in soil by adding organic matter via compost or manure, in a



New research could improve pasture management for coastal organic graziers.

broadacre system this was often financially unviable. “Rock fertilisers (as an alternative) may stimulate micro-organisms where they also increase plant growth and residue inputs to soil.”

However she warns the potential benefits of using rock fertilisers were likely to be specific to location and farm type.

“Rock fertiliser applications are likely to be most effective on pasture in high rainfall areas. Pasture roots are denser, and increase the chance of contact between the rock fertiliser and plant roots, and rain helps with faster fertiliser dissolution.

“High rainfall is needed because this increases the dissolution of rock fertilisers.”

Ms Carson says while clay soils – which retain more water – could hypothetically support higher levels of microbial life for longer – that in the case of rock fertiliser, sandy soils assisted in better dissolving the fertiliser, promoting plant growth.

“This makes organic beef pasture systems along the south west coast of WA prime candidates to utilise the research findings.”

She says fine particle rock fertilisers were selected for the trials to encourage more rapid fertiliser dissolution.

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