

RESEARCH DIRECTIONS

Digging the dirt on carbon storage

Associate Professor Brajesh Singh and Professor Ian Anderson of the Hawkesbury Institute for the Environment, have been awarded funding to investigate the farming practices and soil conditions that will improve carbon storage in arable land. The project, which is supported by the Grains Research and Development Corporation, anticipates environmental, economic and social benefits in this important sector of Australian agriculture.

'Soil contains twice the amount of organic carbon that is found in the atmosphere and three times the amount in vegetation,' says Associate Professor Singh. 'Change in land use or management practices is known to affect how much carbon the soil can store – carbon sequestration - but the how and why of this are largely unknown. Microbes play a key role in soil carbon cycling through decomposition processes but how much control they have over soil carbon accumulation is not understood.'

Soil carbon is responsible for several important functions, including reducing man-made emissions and aiding nutrient availability and water holding for plants. To enhance carbon storage in our farming soils, it is necessary to understand the constraints imposed by microbial population active in the ground. Knowledge of microbial communities and their activities in different soils is currently poor but it is essential for understanding carbon storage under cropping conditions.

Associate Professor Singh's project will develop a detailed understanding of the relative importance of different microbial groups (bacteria, mycorrhizal and saprophytic fungi, for example) in soil formation and structure. The study takes a novel approach by considering soil carbon storage as a function of the interaction between four factors – microbial



communities, soil aggregation or structure, nutrient availability and management practices.

Soil carbon is the largest source of stored carbon on the planet. By finding out more about soil sequestration of carbon, this project will provide the potential for reducing greenhouse gas emissions and increasing soil biodiversity and maintaining or enhancing productivity. All of which will contribute to the sustainability and social and economic wellbeing of agricultural communities. The project sends a strong signal to the community that the grain industry is serious about developing a viable carbon storage strategy that will help it meet the current and future challenges of climate change.

Project Title: Carbon storage: Identifying microbial drivers and key modulators in grain cropping systems

Funding has been set at: \$411,437

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