

Cover crops are unearthing the secrets to improved soil health

MULTI-SPECIES cover cropping is the most effective way to improve soil health, and has the potential to reverse damage caused by years of conventional, full tillage farming practices and boost the sustainability of broadacre dryland cropping in Australia. This conclusion is reached by 2017 Nuffield Scholar, Alex Nixon, whose global research on sustainable farm management practices points to the use of cover crops to greatly increase the health of soils.

Supported by the Grains Research and Development Corporation (GRDC), Alex used his Nuffield Scholarship to research the use of cover crops around the world, and develop a blueprint for the adoption of the emerging land management practice back home.

Alex runs an 8500 hectare cattle and cropping operation near Roma in southern Queensland. As the third generation of his family to farm the land – and with a young family of his own – a desire to leave his property in good condition for future generations motivated his research.

Healthy soils for future generations

“Successful, sustainable farming businesses depend on the health of their soils. Sown after completion of a cash crop, a multi-species cover crop can greatly enhance soil health by boosting biodiversity, ground cover and soil organic matter,” Alex said.

Researching cover crop trials in the US, Alex revealed the benefits that cover cropping can have on the amount of organic matter present in soil.

“Field trials conducted in North Carolina and North Dakota revealed that several consecutive years of cover cropping had allowed organic matter to build up from 1.2 to 6.7 per cent,” he said. “The residue from the cover crops slowly breaks down, providing food for microbes and boosting moisture retention, acting like a mulch.”

Acknowledging that cover cropping in the Australian broadacre sector to date has been largely based on single species crops, Alex’s final Nuffield report reveals that multi-species crops are more beneficial because they avoid the presence of a monoculture and boost microbial diversity and activity.

“Single-species cover crops do enhance ground cover, but by adding even one or two different species into a cover crop the microbial activity can be greatly enhanced, boosting the diversity of the soil ecosystem,” he said.

Alex’s research goes beyond the raw benefits of multi-species cover cropping, to explore the viability of the practice in an Australian context.

Barriers to adoption in the Australian context

“Despite the benefits, a number of barriers to adoption remain for Australian farmers,” he said. “Upfront costs can be an issue. Cover crop seed is very expensive, as is the investment required for machinery or contract sowing.”

“Visiting farms in the US and England, it was clear that the initial cover cropping season can result in some financial deficits.

“At Overbury Farms in England, long-term soil conservation had been prioritised over the short-term bank balance, and lower income was being supplemented by other revenue streams.”

Alex’s report recommends that Australian farmers looking to implement a multi-species cover crop regime start small, and



Alex Nixon with sons, Archie (left) and Eddie (right) in their wheat crop at ‘Jay-Dee’ on the Western Darling Downs, Qld.

consider the frequency and size of cover rotations based on the benefits they can produce.

“While implementing diverse cover crops can pose initial economic issues, the long-term environmental and economic benefits outweigh any initial costs,” he said.

“As soil health improves, input costs on fertiliser and chemicals decrease, while cash crop yields increase. A cover crop also opens up opportunities for alternative revenue streams through livestock grazing or agistment, before the cash crop goes back in.

“Through careful management, multi-species cover cropping is a viable option for Australian broadacre farmers seeking to improve soil health and preserve the landscape for generations to come,” Alex says.

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Final Report: <https://nuffieldinternational.org/live/Report/UK/2017/alex-nixon>

Final Video Link: <https://www.youtube.com/watch?v=eFh6gZ0uVvA&index=6&list=PLWdEyVDhYCjfyWuxFQd0R8qX-E8FcWh> ■