

# Answer to ag productivity lies beneath the boots

**THINK AGAIN:** Soil advisers Michael Eyres and Ed Scott, Injekta Field Systems, say the value of soil performance has been forgotten.

In the quest to extract more agricultural produce from land that has been farmed for long periods of time, croppers have diverted attention away from the major template that creates productivity: the soil.

This is the view of soil advisers Michael Eyres and Ed Scott, Injekta Field Systems, Adelaide.

"It seems there has been a tunnel-vision focus on plant genetics and we've forgotten the real value of soil performance," Mr Eyres said.

"We thought we had ticked all the boxes on soil erosion in the 1930s and then with the advent of conservation tillage and residue retention, people believed that soil issues would no longer be a problem.

"That's not the case. A deeper understanding of soils and their value for long-term increase in farm profitability needs to be a significant focus for any farmer."

Mr Eyres said soils were very much at the front end of precision agriculture.

"We have far better tools and techniques now than ever before," he said.

"We are fortunate in SA to be home to the Waite Institute – one

## Key points

- Ag practices interfere with nutrients
- Renewed soil focus way forward
- Call for 'vertical rate' assessments

of the most well-respected soil research hubs in the world – and they are at the forefront of innovation in soils. We need to increasingly leverage that excellent research to implement more rapid changes in our farming systems."

So why has focus come off soils?

Mr Scott says most people are chasing the 'silver bullet' and taken their eyes off the day-to-day platform that is getting the plant to perform.

"As an industry, agriculture has not really understood soils well enough," he said.

"Agriculture has more so concentrated on trying to change the plant to grow in the adverse soil conditions that we have usually created.

"Researchers hunt them for what they think are better genetics to grow in degraded soils without realising that they can actually change those soil condi-

tions to suit the original plants they were growing, and get more productivity."

So what has happened to our soils since we first cleared the land and started farming?

Mr Scott says soils have become less able to function well because agricultural practices have interfered with their natural ability to cycle and recycle nutrients.

"The capacity of a natural system to keep functioning effectively is closely related to the underlying organic carbon level," he said.

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– ED SCOTT

"Through farming practices, we often accelerate that cycling without replenishing the carbon and it ends up exhausting the system. We are now trying to concentrate on increasing functional carbon levels but it's how you harness that and improve its value which is the really important issue."

Mr Eyres said that although the decline of the soil carbon base had been mapped, the industry had not really worked out the best way to increase it.

"There has been a lot of research and talk about conservation tillage and residue retention adding carbon to soils," he said.

"We now realise that it's not always so. Carbon levels may increase on the surface but not necessarily to a greater depth in the profile.

"We may have exhausted the supply of functional carbon. You can have sticks and branches and leaves present but they may not be functional in a soil system. They have to be degraded into compounds that have the capacity to perform."

Part of the problem is that we are not actually dealing with the different layers in soil.

"We are used to looking at variations over the surface of a soil and use the term 'variable rate' when describing the change across the landscape of soil conditions, soil types and management practices," Mr Eyres said.

He believes it is essential that farmers begin to use the term 'vertical rate' as they explore how best to engineer a productivity

response from soils by looking at how their different cake-like layers react with each other.

"Soil is not homogenous," he said.

Mr Scott sees a resurgence in the recognition of soils as the major force in increasing agricultural productivity, particularly with shifting climatic conditions.

"Across the board, even when annual rainfall levels may be the same, it's when it rains and when it doesn't that determines how we need to look at soils differently to get the most out of them," he said.

Mr Eyres recalls helping clients with chemically fertile soils, whose crops failed every dry spring because their roots and rainfall were unable to reach formerly accessible lower soil layers.

"Sometimes in soils, the more you try to wreck them with poor farming practices, the less they give you to work with," he said.

"You end up using more and more of the surface and less of the subsoil. That's why with some clients we were able to go into the soils they thought had been degraded and turn them around quickly because we knew the sub-surface hadn't been destroyed."

