

A New Zealand study measuring a key component of soil health could help kiwifruit growers better manage orchard inputs like protective sprays, fertilizers and water. 

The PlusGroup report profiles organic carbon stores deep below 104 kiwifruit orchards with underground mapping, measuring the different levels of Soil Organic Carbon (SOC).

SOC is converted by kiwifruit vines from carbon dioxide in the air, giving the soil a greater ability to store water and nutrients, as well as contributing to natural pest control through healthy microbial activity.

The report has several interesting findings, including the fact that more established orchard blocks sequestered more carbon at a higher rate than younger ones, while Hayward green kiwifruit caused significantly less greenhouse gas emissions per kilogram than Hort16A gold kiwifruit.

The report says New Zealand's kiwifruit industry sequesters around 90,000 metric tons (MT) of carbon each year, with the highest levels of SOC in Northland and the lowest rates in Hawkes Bay.

"The findings of the report stand to challenge current thinking and orchard management practices across New Zealand's perennial tree crop industries including avocado, pipfruit and summerfruits," said researcher Allister Holmes.

"This could potentially lead to significant financial benefits for growers and ecological benefits for New Zealand.

"By fully understanding the SOC profile of their orchard, a grower may be able to tailor orchard management practices to maintain and improve SOC, harnessing the natural water storage capability and the nutrient and microbial activity of the soil, in order to maximise orchard productivity and increase profitability."

Increases in SOC improve soil drainage, root penetration and help reduce soil compaction. This knowledge is critical for areas with low levels of natural SOC, such as Gisborne, Hawkes Bay and Motueka.

The report says changing orchard management practices to increase SOC levels creates benefits for the surrounding land and downstream waterways, contributing to lowering the kiwifruit industry's carbon footprint.

The research also involved Crown institute Plant & Food Research, and was funded by

Zespri International and the Ministry for Primary Industries' Sustainable Farming Fund.

Zespri Innovation Leader Alistair Mowat said the soil carbon findings had important implications for the industry.

"Global retailers are looking for food suppliers which are more resilient to extreme events like flooding and drought. Soil carbon is a critical factor here, as the carbon content of soils is a clear indicator of soil health," he said in a release.

"Sequestering carbon from the atmosphere into the soil also helps offset the carbon emissions involved in growing and distributing kiwifruit. Produce from New Zealand is regarded as 'clean and green' and it's work like this which helps us verify those claims."

A Zespri release pointed out the water-holding capacity of soil could help buffer crops against extreme weather events such as heavy rain or drought.

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