

Healthy Soil

“Soil is our biggest asset and I don't believe farmers have enough information to quantify the benefits of soil biology. Our animal health is good, but I can't tell you why. I think it is the biological system that is doing it, but I need the science to tell me how.”

(Taranaki farmer Lane Cookson)

“It was very revealing. We were able to plug various inputs and adjustments into the programme and then see the effects they would have on soil fertility and nitrate leaching.”

(Waikato farmer Kathy Bentham talking about the Overseer programme.)

“It's important to know where your best soil resources are. It helps with soil fertility advice as some areas might require more nutrients while others require less.” (Soil scientist Alan Palmer on the value of GIS soil mapping.)

“Organic farmers have to be on guard in terms of monitoring the fertility status of their soils and making sure they take pre-emptive measures to avoid nutrient loss.” (Soil scientist Dave Horne)

Key findings

The Overseer programme was used to estimate the maintenance nutrient requirements, nitrogen leaching and nutrient use efficiency on the 8 case study organic dairy farms. All the organic farms had much the same levels of the major soil nutrients (nitrogen, phosphorus and potassium) as non-organic New Zealand farms – there were no major deficiencies.

The organic farms were leaching significantly less nitrogen than non-organic dairy farms – between 50-60% less than non-organic farms in their region. For example, the Waikato organic farms in the study were leaching on average only 18 kg of nitrogen per hectare, whereas only 6% of the non-organic farms in the Waikato surveyed in 2011 were leaching less than 20 kg/ha, and two-thirds were losing between 35 and 55 kg/ha.

While low rates of nitrogen application and hence leaching are good for the environment, they may not be so good for pasture growth - leading to a lower efficiency of nitrogen use on organic farms. Further, while the phosphorus and potassium levels measured on the study farms are fine at present, they have shown a tendency to drop over time, and need watching to make sure they do not drop further.

Detailed findings on soil nutrient levels and what to look out for can be found in the the paper by D. J.Horne, E.F. Dijkstra, A. S. Palmer, P. Carey (2012) 'Issues related to the management of nutrients on organic dairy farms: Nitrate leaching and maintaining soil nutrient levels', originally published in *Proceedings of the New Zealand Grassland Association* and now available in the Soil section of the Organic Dairy and Pastoral Group website: <https://organicpastoral.co.nz/resources-2/soil/>

