UNDERSTANDING THE RISKS OF CADMIUM ACCUMULATION IN NEW ZEALAND AGRICULTURAL SOILS

Dr Jo Cavanagh[1], Mr Michael Yi[2], Dr Nik Lehto[2], Dr Brett Robinson[2], Dr Col Gray[3]
[1]Landcare Research, [2]Lincoln University, [3]AgResearch

The New Zealand economy relies heavily on the primary production sector and the use of phosphate fertilisers. Cadmium (Cd) occurs naturally in the phosphate rock used to produce phosphate fertilisers and is present in fertiliser at varying levels. Different factors influence Cd uptake into plants (and therefore the human food chain) and, to manage the health risks of Cd, we need a better understanding of the soil-plant relationships involved. To address the lack of New Zealand-specific science, a two-year project has recently started, funded by the Ministry for Primary Industries and the Fertiliser Association of New Zealand, with support from Vegetables New Zealand, Onions New Zealand, Foundation for Arable Research, the New Zealand Flour Millers Association, Baking Industry Research Trust, DairyNZ, Landcare Research and regional councils. A key focus of this project is to understand the influence of soil properties on Cd uptake in key agricultural crops: leafy greens, potatoes, onions and wheat. As part of this, soil and plant samples were collected from existing industry trials and/or commercial fields in the main commercial growing areas for each crop across New Zealand. Around 20 sites were sampled for each of potatoes, wheat or onions, with plant and soil samples taken from each of three or four replicate plots per crop. A smaller number of sites with spinach and lettuce were assessed. Analyses of the samples showed the main soil properties of interest (pH, total carbon, CEC and soil cadmium) spanned a range of values, with the relationship to plant uptake currently being examined. This information provides a baseline assessment of Cd uptake into New Zealand crops and insight into management practices that can reduce plant uptake of Cd.