

Predicting bioavailable cadmium levels in soils

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New Zealand's pastoral landscapes are some of the loveliest in the world, but they also contain a hidden threat. Many of the country's pasture soils have become enriched in cadmium. Grasses take up this toxic heavy metal, which is then eaten by the cattle and sheep that graze them. The problem is not unique to New Zealand; cadmium-enriched soils being reported worldwide.

The concern is that if [cadmium](#) concentrations rise to unsafe levels in meat and dairy products, human health and New Zealand's agricultural economy could be jeopardized. That so far hasn't happened.

But, New Zealand isn't taking any chances. Brett Robinson, a scientist with New Zealand's Lincoln University, recently published an article in the Mar. 21, 2014 edition of the *Journal of Environmental Quality* that gives some solutions to the problem.

The use of phosphate fertilizers over many decades—contaminated with cadmium—created the current conditions. These practices continue today. Robinson and his team are trying to determine which soil factors most strongly affect soil cadmium concentrations. They found that soil pH, iron concentrations and total [cadmium levels](#) were excellent predictors of how much cadmium is biologically available for plants.

Robinson's work also shows ways to keep the cadmium from being taken up by plants. His research showed that more [acidic soils](#) increased the cadmium that is available to plants. So, using lime to prevent soil

acidification could help "lock" the cadmium in the soil.

Similarly, iron oxides bind cadmium tightly and hold it in soil. Robinson is working with the coal-mining company, Solid Energy New Zealand, and the Swiss Federal Institute of Technology to determine whether certain [soil](#) amendments will reduce plant uptake of cadmium. Robinson's research can also be applied worldwide to help with cadmium contamination.

More information: A copy of the full article can be accessed at [www.soils.org/discover-soils/s ... new-zealand-pastures](http://www.soils.org/discover-soils/s...new-zealand-pastures)

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