

An economic perspective on soil amendment use for regulating cadmium bioavailability in horticultural soils

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Horticulture in New Zealand is a rapidly expanding industry, with exports recently growing to reach a record \$4.3 billion. However, risks to this sector exist in the form of cadmium (Cd) accumulation within productive soils due to the Cd content of phosphate fertilisers, and their widespread repeated application. Exclusion from international markets can occur when foodstuffs exceed food safety guidelines for Cd as a result of production on contaminated soils. New Zealand's current system for managing soil Cd, the Tiered Fertiliser Management System, fails to account for variances in Cd plant uptake across soil types, crop species, and soil chemical and biological properties. There is a need here to establish risk based guidelines which cater to New Zealand's vast range of horticultural environments. As soil pH and organic matter content are the two primary soil properties controlling Cd bioavailability, manipulating these variables using lime and compost amendments can have beneficial effects by limiting Cd plant uptake. A cost-benefit analysis is being designed to determine whether using lime and compost amendments to manipulate these soil properties, as is being tested within current New Zealand field trials, can effectively regulate plant uptake of Cd and is therefore a worthwhile solution to the issue of soil Cd contamination. This will aid in the development of operational risk based guidelines for New Zealand's horticultural soils, and work to maintain the sustainability of this key national industry.