

Effect of Canberra sewage ash on soil pH and cadmium levels

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Public awareness of sewage sludge as a nutrient resource has been increasing in recent times. In a country with some of the world's oldest, poorest soils, this is an important awakening. With 80% of Australians living in towns and cities, and as a major exporter of agricultural products, we cannot persist in tipping this commodity into oceans and landfill sites.

Current research, such as the grazing trials near Goulburn and elsewhere in NSW, will provide valuable further information about the agricultural potential of sewage and sewage-based products.

Earlier research has already been of assistance in making judgements about the value of some sewage products. In the late 1970s Paul Dann was approached by the Lower Molonglo Water Quality Control Centre (LMWQCC) to assess whether sewage ash being dumped at the Molonglo tip had any potential for agricultural use. The experiments compared sewage ash and other liming sources at equal neutralising value and at different rates, plus varying rates of superphosphate.

The result in average or better rainfall years showed:

- legume-based pastures grown on low phosphate acid soils respond well to sewage ash;
- legume leaf phosphate levels rose with increasing sewage ash application rates indicating

phosphorus uptake into the plant.

It was also found that lime was more effective in reducing soil acidity than sewage ash. Lime was about 20% better than sewage ash in reducing soil acidity.

Current research

Whilst sewage ash is a sterile product, there is community concern regarding heavy metals. The current research focuses on this concern and compares various rates of topdressed sewage ash compared to lime and superphosphate in a naturally

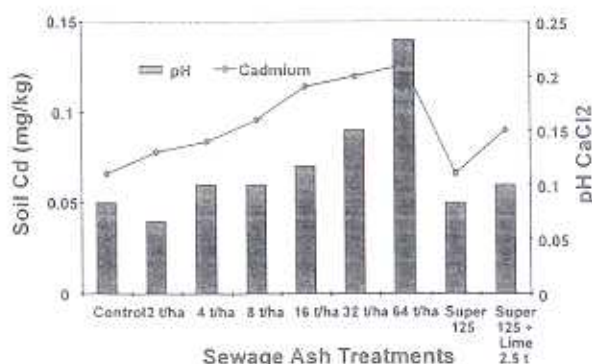


Figure 1: Effect of sewage ash, lime and superphosphate treatments on changes in soil pH and soil Cd concentrations.

occurring acid soil, low in available phosphate.

Interim results for cadmium and changes in soil pH are presented in the Fig. 1.

Discussion

Sewage ash has approximately 50% neutralising value of lime. Soil pH steadily increased in the top 10 cms of soil with increasing application rate up to 32 t/ha.

There were no significant differences in soil cadmium except at the 64 t/ha application rate in the top 10 cm of soil. All levels were less than 5% of ANZECC/NHMRC (1992) guidelines for soil.

Although the application of sewage ash increased soil cadmium concentrations, cadmium levels found in the corresponding pasture herbage actually decreased, compared to the control

treatment. This is because of the increase in soil pH with ash application which reduces the phytoavailability of the ash cadmium. Herbage cadmium levels in plants grown on the superphosphate treatments were higher than all (including control) of the ash treatments, even at application rates as high as 64 t/ha.

References

- Guidelines for Soil. ANZECC/NHMRC (1992).
- Simpson, PC (1993). Using Canberra Sewage Ash on Southern Tablelands Pastures. Agnote 4/61, NSW Agriculture.

Acknowledgments

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