

EFFECT OF STEEL CONVERTER SLAG AND URBAN WASTE COMPOST APPLICATION ON THE UPTAKE OF LEAD AND CADMIUM BY CORN

Fateme Saberiyani Borujeni^{1*}, Mahmood Kalbasi², Mehran Hoodaji²
1. Soil Science, Islamic Azad University of Esfahan, Khorasgan Branch,
2. Agronomy Group, Islamic Azad University of Esfahan, Khorasgan Branch
[*Fatima.Saberian@yahoo.com](mailto:Fatima.Saberian@yahoo.com)

Introduction

Application of organic and industrial wastes is a suitable way to restore plant nutrients in soil and to improve quality and quantity of plant productions. However, waste application may result in accumulation of heavy metals and increase in salinity of soil which in turn could contaminate soil and plants and endanger human health and well being (Sharifi and et.al, 1389). Objective of this study was to determine the effect of urban waste compost and steel converter slag application on the uptake of Pb and Cd in corn.

Materials and Methods

A pot experiment was conducted in Azad University greenhouse with 7 treatments and 3 replications using a randomized block design. Treatments included application of steel converter slag and urban waste compost (both at 2.5 and 5.0% soil weight bases), a mixture of both (2.5% +2.5%, respectively), FeEDDHA (on the basis of 5 mgFe/kg soil) and control. Materials were completely mixed with soil and were incubated at 70% FC moisture content for 25 days. Corn seeds were planted in the pots after the incubation period and plants were harvested after 75 days. Plant tissues were extracted using wet digestion and digests were analyzed for total Pb and Cd content using AAS. Statistical analyses were done using SAS program.

Results and Discussion

Results showed that all the treatments resulted in significant reduction in the concentration of plant's Pb and Cd compared to the control. Treatments increased available content of Pb and Cd significantly in soil except for 2.5% compost application. Increase in uptake and available form of Pb and Cd may have been caused by increase in organic matter content of soil especially in compost treatments. Soil salinity also was increased in compost treated pots due to the high salinity of compost. Increase in plant's Pb and Cd concentration especially in slag treated pots may be due to the increases in pH of soil and precipitation of Pb and Cd in soil in unavailable forms. FeEDDHA application had no effect on concentration of plant Pb but slightly increased the concentration of plant's Cd.

Key words: converter slag, urban waste compost, corn, lead, cadmium

References

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