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LEACHABILITY OF IODINE FROM SOILS OF DIFFERENT LAND USES AS AFFECTED BY SELECTED AMENDMENTS

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Abstract

Iodine is an essential microelement required by humans and animals. Leaching of soils under intensive rains has threatened the fertility status of iodine in soils. Therefore, four discrete amendments were used for the mitigation of iodine leaching from soils. For this study, soils collected from four land uses were mixed with the amendments (gypsum, lime, fly ash, charcoal and sawdust) at the rate of 0, 2.5% and 5% (w/w) in PVC columns. Potassium iodide (KI) was applied to the soil at rate of 100 mg kg^{-1} and 200 mg kg^{-1}. Iodine was determined in water after three leaching events. Results indicated that soil of each land use had apparently influenced the leachability of iodine. Lower amount of iodine was released from the barren and pasture soils as compared to the soils of agriculture and forest land uses. Application of amendments significantly reduced the leaching of iodine from soil. Application of KI increased iodine concentration in the leachate. Across all soils, reduction of iodine leaching or retention of iodine among soil amendments varied in the order charcoal > sawdust > fly ash > gypsum > lime. Overall charcoal and sawdust efficiently reduced iodine leaching than other three amendments. The pH values of the leachate were oppositely associated with the iodine retention of soil. Iodine concentrations in soils were related to the amount of soil organic matter. This study has shown that the retention of iodine in soils could potentially be ameliorated by a suitable soil amendment.

Keywords: iodine, land uses, leaching, unstructured soils, soil amendments

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