

Biochar as a bio amendment to reduce heavy metals translocation into Maize

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Heavy metal contaminated soil is rich in Pb and Cu in extreme concentrations, generate an unfavourable surroundings for agriculture and human health through phyto-accumulation. This study was conducted to assess the possibility of particular bio-amendment, Biochar (BC) on the reduction of bioavailable Pb and Cu in such contaminated soil. Biochar produced by *Gliricidiasepium* (BC700), at a same time, it is a waste from Dendro power plant was used to evaluate its ability to be used in soil remediation. A pot experiment was conducted with Maize (*Zea mays*) by adding BC700 at three different percentages, 1.0, 2.5 and 5.0% (w/w). Soil that was taken from shooting range area of diyadalawa, without any amendments served as a control. Experiment was arranged in a complete randomized design with three replicates. Translocation rate of heavy metals into crop were determined in maize plants. Sequential extraction was conducted to determine the bioavailability and other phases of heavy metals in soil. Sequential extraction procedure was used to measure the metal concentration in soil and the total, and exchangeable concentrations of Pb were 20843, 2058 and Cu were 1861, 102 mg/kg respectively. After sixth week, maize plants were harvested and analysed followed by digestion with con.HNO₃. The most significant immobilization ($p < 0.05$) was indicated by treatment 5% BC700 for Pb and Cu with 49% and 84% respectively than the control. The results suggested that the addition of 5% BC which is a waste by-product of the bioenergy industry has the capability of immobilizing heavy metals and thus reducing the phyto-toxicity in shooting range soil. Metal translocation towards plant was decreased with increasing application rate of amendments. Determination of

Plant factor (PF) and Translocation factor (TF) indicated that PF was greater than TF in maize. Heavy metal tolerant plant with high PF and low TF could be used for phytostabilization of contaminated site. There by maize could be considered as a potential phytostabilizer.

Keywords: Biochar, Dendro, Phytostabilizer, Translocation.