

ABSTRACT

The purpose of this investigation is a trial towards heavy metals, especially Cd and Pb, immobilization in contaminated soils by chemical techniques, i.e., application of inorganic or organic amendments for their ability to immobilize such metals, and in turn reducing their uptake and accumulation by different plant species. Moreover, this work involved phytoremediation technology by growing some crops, i.e., kenaf as a fibre crop and comparing with red radish as an edible crop. Experiment (1) involved application of gypsum, lime, organic compost, chelating agents (Zn-EDTA and Fe-EDDHA) at rates of 0, 5, 10 and 20 ton/fed; 0, 1, 2 and 4 ton/fed; 0, 10, 20 and 30 m³/fed. and 0, 1, 2 and 4 kg/fed., respectively to El-Gabal El-Asfar farm (polluted soil). Experiment (2) involved application of either Cd at rates of 0, 7.5 and 15 mg kg⁻¹ soil or Pb at rates of 0, 150 and 300 mg kg⁻¹ soil in combination with the best treatment of soil amendments (10 ton gypsum/fed; 20 m³ organic compost/fed; 2 ton liming /fed and 2 kg/fed for iron and zinc chelates) to Ismailia soil (unpolluted). Application of the used soil amendments increased the dry matter yield of red radish and kenaf plants, while decreased the content and uptake of Cd or Pb. The compost was the most efficient amendments, while liming was the lowest efficiency. The highest

reduction in available and availability index of Cd or Pb after harvesting of red radish and kenaf plants was obtained with the compost application. The adverse effect of Cd or Pb levels on plant growth was much more pronounced in roots for red radish and in shoots for kenaf plants. Application of soil amendments increased the dry matter yield of red radish and kenaf plants and decreased Cd or Pb contents and uptake, being compost was the most effective. Application of soil amendments, except liming, decreased soil pH, available and availability index, being organic compost was the best soil amendments. The efficiency of the added soil amendments could be arranged as follows: compost > gypsum > lime > Fe-EDDHA > Zn-EDTA.

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