Low-Cost Agricultural Measures to Reduce Heavy Metals Uptake by Food Crops

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Heavy metal contamination affects large areas of Iran and worldwide. Hot spots of pollution are located close to industrial sites, around large cities and in the vicinity of mining and smelting plants. Agriculture in these areas faces major problems due to heavy metal transfer into crops and subsequently into the food chain. This paper gives an overview on simple but effective countermeasures to reduce the uptake of heavy metals by food crops. Since crop species and varieties largely differ in their heavy metal uptake, choosing plants with low transfer factors (e.g., legumes, cereals) may reduce metal concentration in edible parts significantly. The application of soil amendments is another very effective measure to reduce the concentration of heavy metals in crops. Both organic (e.g., farmyard manure) and inorganic amendments (e.g., lime, zeolites, and iron oxides) were found to decrease the metal accumulation. Further effective methods to reduce metal transfer into food chain include crop rotation and cultivation of industrial or bio-energy crops. It is concluded that the methods presented here comprise several tools, which are easy to apply, and are effective to allow safe agriculture on moderately contaminated soils.

Keywords: Heavy metals; Soil contamination; Low metal uptake crops; Soil amendments

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