



Phytoextraction and phytostabilisation of metal-contaminated soil in temperate maritime climate of coastal British Columbia, Canada

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This research addressed the phytoremediation of roadside soils subjected to multi-component metal solutions. A typical right of way for roads in Canada is around 30 m, and at least 33% of that land in the right of way is unpaved and can support animal life. Thus, land associated with 12,000 km of roads in the province of British Columbia and millions of kilometres around the world represent a substantial quantity of wildlife habitat where metal contamination needs to be remediated. Phytostabilisation, requires least maintenance among different phytoremediation techniques, and it could be a feasible and practical method of remediating in roadside soils along highways and for improving highway runoff drainage. The suitability of five plant species was studied for phytoextraction and phytostabilisation in a region with temperate maritime climate of coastal British Columbia, Canada. Pot experiments were conducted using *Lolium perenne* L (perennial rye grass), *Festuca rubra* L (creeping red fescue), *Helianthus annuus* L (sunflower), *Poa pratensis* L (Kentucky bluegrass) and *Brassica napus* L (rape) in soils treated with three different metal (Cu, Pb, Mn and Zn) concentrations. The bio-metric characters of plants in soils with multiple-metal contaminations, their metal accumulation characteristics, translocation properties and metal removal were assessed at different stages of plant growth, 90 and 120 DAS (days after sowing). *Lolium* was found to be suitable for the phytostabilisation of Cu and Pb, *Festuca* for Mn and *Poa* for Zn. Metal removal was higher at 120 than at 90 days after sowing, and metals concentrated more in the underground tissues with less translocation to the above-ground parts. Bioconcentration factors indicate that *Festuca* had the highest accumulation for Cu, *Helianthus* for Pb and Zn and *Poa* for Mn.