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土法炼锌区基质改良对刺槐生长的影响

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Effect of Substrate Amelioration on Growth of *Robinia Pseudoacacia* in a Typical Deserted Zinc Smelting Site

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摘要 植被重建是废弃地污染控制的有效途径。通过苗圃盆栽试验和田间植被重建试验，研究了不同改良措施对贵州省赫章县土法炼锌污染场地土壤理化特性、重金属含量特征和刺槐(*Robinia pseudoacacia*)生长特性的影响，探索废弃地植物重建限制因子和基质改良途径。研究表明，废渣上植被重建的限制因子主要表现为盐碱胁迫，全氮、碱解氮和全钾含量低，重金属含量高，持水保水能力差。废渣中Pb、Zn和Cd含量高，但其活性较低。新废渣中添加矿区土壤，可导致pH值和(EC)降低，盐碱胁迫减缓，持水能力提高，并显著提高刺槐在新废渣上的生长和生存能力，是废渣基质改良的有效方式。废渣经过长期淋溶后，盐碱胁迫强度显著降低，土壤有效水分增加。添加保水剂或矿区土壤能有效促进刺槐在老废渣上定植。

关键词： 赫章 废弃地 植被重建 限制因子 基质改良 刺槐

Abstract： Revegetation can be a suitable option to control pollution in deserted mining sites. A pot experiment and a field experiment using *Robinia pseudoacacia* were carried out in a deserted zinc smelting site, typical of Hezhang County, Guizhou Province, China to explore effects of various soil amelioration approaches on soil physical-chemical properties, contents of heavy metals, growth of *R. pseudoacacia* and limiting factors in revegetation. Results show that the limiting factors in revegetation of slag wasteland of slag were mainly salt-alkali stress, low contents of total N, available N and total K, high concentrations of Pb, Zn and Cd and low water retention capacity. Although elevated Pb, Zn and Cd concentrations were present in the slag wasteland, their exchangeable fractions were low. Amendment of the new slag wasteland of new slags with the soil from the site may lower pH and EC, reduce salt-alkali stress and increase water retention capacity of the land, thus significantly improving the survival and growth rate of *R. pseudoacacia* therein. Therefore, the amendment was an effective method to ameliorate the substrate or the wasteland for revegetation. Years of leaching significantly reduced salt-alkali stress to the trees, and increased available soil water content of the wastelands. Application of hydrogel or soil from the mining site can effectively help the survive and establish of *R. pseudoacacia* survive and establish in old slag wastelands.

Keywords： Hezhang County wasteland revegetation limiting factors substrate amelioration *Robinia pseudoacacia*

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