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Steel Slag as a Remediation Material for Degraded Land

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Introduction

Land degradation, particularly fermentation, are global challenges that must be addressed. The use of lime or material manures that involve the extraction of unrefined components is a common solution to this problem. This study proposes using Basic Oxygen Furnace (BOF) slag as a more cost-effective alternative. BOF slag is the major waste from the steel industry that is commonly disposed of in landfills, which has environmental implications. The feasibility of using BOF slag for the rehabilitation of degraded land has been investigated in this paper through a series of research facility tests. BOF slag will be researched as a liming specialist for soil fermentation. However, the benefits of slag as a supplement source will be investigated.

The results of these short-term testing reveal that BOF slag could be a viable liming specialist and corrective solution. Its use increased the amount of micronutrients and macronutrients available for plant development while also improving soil quality. As a result, it might be a cost-cutting administration strategy that makes a strong commitment to the circular economy.

There were no significant differences in pH levels achieved ($p > 0.05$), although higher rates of dry biomass were obtained (p 0.02). Furthermore, depending on the needs of each scenario, a different type of slag with a different molecular size can be used with different buffering effects. Normal techniques with ordinary materials, such as lime or substance composts, are not sufficient to improve soil quality due to the supplement source. In slag experiments, phosphorus levels increased, while potassium and nitrogen fixations decreased.

The greatest significant effect was on Ca levels, which were greater in the pots with untreated slag (p 0.02). Slag expansion was also effective on dry biomass. While the slag molecule size had no effect on the level of cover, adjustments of 0-20 mm resulted in significantly decreased dry biomass rates. In general, allone slag, both pretreated and untreated, improves soil quality and the availability of macro and micronutrients for plant development. This isn't the case with fine-grained slag (0-20 mm), which has been deemed unsuitable for this purpose. T25 and S25 were the best-performing changes. As the slag content increases, the mobility of a few essential supplements, such as Mg, decreases, therefore a 25 percent increase isn't recompatched.

In the future, it would be beneficial to rehash the test with a larger number of recreates because tests with slag typically showed more variance in the outcomes. Furthermore, it would be intriguing to break down the heavy metals in soil leachates during the test to see how they alter over time. Concerning this, a longterm investigation on a real scale and the heavy metal content of the slag would be quite interesting to prove that the use of this waste is not harmful to the environment. The use of BOF slag for land corruption rehabilitation could be a sensible administration practise because it recovers waste that would otherwise end up in landfills and also avoids the mining of minerals.

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