

Biochar Co-composting: A Strategy for Improving Compost Quality

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Use of biochar as a raw material in compost mixture has demonstrated numerous benefits during the composting process and to the end product. Changes in quality parameters in compost made by co-composting with poultry litter (PL) and PL biochar (PLB) were studied. Compost was made using the closed heap method. PLB was prepared by co-pyrolysing PL with (5% w/w) or without (0% w/w) Eppawala Rock Phosphate (ERP). Thus, four types of composts were produced: compost without biochar or PL (C), co-compost with 10% (w/w) PL (C_{PL}), co-compost with 10% (w/w) PLB (C_{PLB}), and co-compost with 10% (w/w) PLB co-pyrolysed with ERP (C_{PLB-ERP}). Composts were characterized for chemical parameters in SLS 1635 using standard laboratory methods. Incorporation of PLB and PLB-ERP has significantly increased the total phosphorus in composts by approximately three-fold compared to C and C_{PL}. Applying biochar enhanced the total potassium content by 33-47%, while also increasing the total Ca and Mg contents ($p < 0.05$). There is no significant variation in Fe, Cu, Mn and Zn contents. Compared to C_{PL}, a significant reduction in total nitrogen content was observed in C_{PLB} and C_{PLB-ERP}. The addition of ERP had led to an increase in total As content in C_{PLB-ERP}, but still within the maximum permissible levels. Notably, biochar application reduced the total Pb content, while other heavy metals did not show significant differences among compost types. When considering quality parameters holistically, incorporation of PLB and PLB-ERP during the composting process enhances the quality of the compost produced.

Keywords: Co-pyrolysis, Eppawala Rock Phosphate, Poultry litter biochar

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