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Effect of biochar and humic acid on the Copper, Lead, and Cadmium passivation during composting

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Abstract

In this study, two different biochar (sawdust charcoal (SDC) and wheat straw charcoal (WSC)) and biological humic acid (BHA) were used with different addition rate in pig manure composting to illustrate the effect on heavy metals passivation. And the composts were applied to rape (*Brassica campestris L.*) growth to illustrate the stability the passivation. Results showed the concentration of Cu, Cd, and Pb increased after composting, whereas the passivation rate of Cu, Pb, and Cd reached a maximum of 94.98%, 65.55%, and 68.78%, respectively. When the composts were applied to rape growth, the exchangeable fraction of Cu, Pb, and Cd in the soil further decreased and reduced the accumulation of heavy metals in the rape plant. The rape yield increased by 19.39%–34.35%. The optimal addition ratios of the three passivators were SDC 5%, WSC 7.5% and JBHA 2.5% to reduce the health risk of heavy metals in rape products.

Key words: Manure; Compost; Biochar; Heavy metal; Inactivation.

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