

泥炭对菜心-土壤系统中重金属生物有效性的效应研究

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Effect of peat on heavy metal bioavailability in soil system and flowering Chinese cabbage

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摘要

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摘要 以菜心为研究对象, 利用盆栽试验, 观测在重金属Cu (200 mg/kg)、Cr (300 mg/kg)、Pb (1000 mg/kg) 污染的土壤上添加不同用量的泥炭(0%、0.5%、1%、2%、4%、5%)对重金属生物有效性及其土壤形态分布的影响。结果表明, 随着泥炭施用量的增加, 菜心采收时土壤重金属的形态分布发生了改变, DTPA交换态的重金属明显减少, 有机结合态重金属明显增加, 菜心根、茎、叶重金属含量显著降低; 从总体趋势来看产量有所提高, 只是在5%或4%的泥炭施用水平下产量略有下降。说明在0%~5%范围内的泥炭施用量能降低铜、铬、铅重金属污染土壤的生物有效性, 0%~3%范围内的泥炭施用量能提高菜心产量。

关键词: 泥炭 菜心 重金属 生物有效性 泥炭 菜心 重金属 生物有效性

Abstract:

A pot experiment with flowering Chinese cabbage (*Brassica campestris* L. ssp. *chinensis* Var. *utilis* Tsenet Lee) was conducted to study the effect of amended peat rates on the bioavailability and chemical form distribution of heavy metals in soil. The pots were added with 3 sets of soil amended with Cu 200 mg/kg, Cr 300 mg/kg and Pb 1000 mg/kg. One set of soil was amended with 6 peat treatments, i.e. 0%, 0.5%, 1%, 2%, 4% and 5%, respectively. Each treatment of one heavy metal set had four replications. With the increase of peat rates, the distribution of heavy metals, content of the DTPA-exchangeable heavy metals in the soil and in the root, stem and leaf of the plants changed significantly. On the contrary, the content of organically bounded heavy metals in the soil and the yield of flowering Chinese cabbage were enhanced greatly as a whole, but the yield decline occurred in the treatment with 4% or 5% peat rate. In a word, the 0%~5% peat rates reduced the bioavailability of the heavy metals Cu, Cr, Pb and 0%~3% peat rates enhanced the vegetable yield in the soil polluted by heavy metals.

Keywords:

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