中国农学通报 2011, 27(第13期6月) 194-198 DOI: ISSN: 1000-6850 CN: 11-1984/S

园艺—研究报告

土壤重金属Pb和Cd在小白菜中的富集特征及产地环境安全临界值

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摘要:

通过盆栽盆栽试验，研究了江苏两种不同类型土壤，即水稻土和潮土中小白菜可食部分对Pb和Cd的富集特征，并探讨了Pb与Cd在产地土壤环境中的安全临界值。结果表明，总体上小白菜可食部分对Pb和Cd的富集，在两种土壤类型下均随处理浓度的增加呈现递增趋势。和对照相比，两种土壤中小白菜可食部分Pb的最高含量分别提高了18.31和9.49倍，Cd的最高含量分别提高了15.4和10.04倍。同一处理水平下，水稻土中的Pb和Cd比潮土中的更易被植物富集。水稻土中小白菜可食部分Pb含量是潮土中的2.54倍，Cd含量则是潮土中的1.92倍。依据国家食品污染物限量标准（GB 2762-2005），进行方程拟合，得出的种植小白菜的水稻土Pb和Cd的安全临界值分别为36.54 mg?kg-1和0.30 mg?kg-1，低于或等于国家土壤环境安全标准限制的临界值（HJ332-2006）。潮土Pb和Cd的安全临界值分别为 110.21 mg?kg-1 和1.09 mg?kg-1，均高于国家土壤环境安全标准限制的临界值（HJ332-2006）。

关键词： 临界值

Soil Pb and Cd Accumulation Characteristics of Pakchoi (Brassica chinensis L.) and Their Environmental Critical Values in Pakchoi Production Area for Food Security

Abstract:

The experiment was conducted to study the dose-response relationship of soil lead (Pb) and cadmium (Cd) concentration with their uptakes by Pakchoi (Brassica chinensis L.), as well as their environmental critical values in Pakchoi production area for food security. The results showed that: (1) generally, the contents of Pb and Cd in the edible parts of Pakchoi increased along with the concentrations of soil Pb and Cd in two soil types (Alluvial soil and Paddy soil). Compared with the control, the highest contents of Pb in the edible parts of Pakchoi increased by 18.31 and 9.49 times, and the highest contents of Cd increased by 15.4 and 10.04 times in the two types of soil, respectively; (2) Pb and Cd in the Paddy soil were easily enriched by the crop than in the Alluvial soil. Pb and Cd concentrations in the edible parts of Pakchoi in the Paddy soil were 2.54 and 1.92 times higher than those in the Alluvial soil, respectively, under the same treatment level; (3) based on the National standards for maximum levels of heavy metal contaminants in foods (GB-2762-2005), the environmental critical values of soil Pb and Cd in the Paddy field were calculated as 36.54 mg?kg-1 and 0.3 mg?kg-1, respectively, which were equal or lower than those in National standards of soil security (HJ332-2006). The environmental critical values of soil Pb and Cd in the Alluvial field were calculated as 110.21 mg?kg-1 and 1.09 mg?kg-1, respectively, which were higher than those in National standards of soil security (HJ332-2006).

Keywords: critical value

收稿日期 2009-12-15 **修回日期** 2010-01-04 **网络版发布日期** 2011-06-13

DOI:

基金项目:

公益性行业（农业）科研专项

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