PLANT NUTRITION AND FERT

ISSN 1008-505X
CN 11-3996/S

植物营养与肥料学报 » 2010, Vol. 16 » Issue (1) :129-135 DOI:

长期施用有机肥对土壤和糙米 铜、锌、铁、锰和镉积累的影响

李本银[1，2]，黄绍敏[1]，张玉亭[1]，周东美[2]，吴晓晨[2]，沈阿林[1]，徐建明[3]，李忠佩[2]

1 河南省农业科学院植物营养与资源环境研究所，郑州 450002； 2 中国科学院南京土壤研究所，南京 210008；3 浙江大学环境与资源学院，杭州 310058</i>

Effect of long-term application of organic fertilizer on Cu, Zn, Fe, Mn and Cd in soil and brown rice

LI Ben-yin[1,2], HUANG Shao-min[1], ZHANG Yu-ting[1], ZHOU Dong-mei[2], WU Xiao-chen[2], SHEN A-lin[1], XU Jian-ming[3], LI Zhong-pei[2]*

1 Institute of Plant Nutrition, Agricultural Resources and Environmental Science, Henan Academy of Agricultural Sciences, Zhengzhou 450002, China; 2 Institute of Soil Science, Chinese Academy of Sciences, Nanjing 210008, China;3 College of Environment and Resources, Zhejiang University, Hangzhou 310058, China

摘要 | 参考文献 | 相关文章

Download: PDF (176KB) HTML 1KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 设施氮、磷、钾肥（NPK）、施氮、磷、钾肥兼稻草还田（NPKS）、施氮、磷、钾肥兼2倍稻草还田（NPKS2）、施氮、磷、钾肥兼施紫云英（NPKG）和施氮、磷、钾肥兼施猪粪5个处理的长期定位试验，探讨了长期施用有机肥对土壤和糙米铜、锌、铁、锰和镉含量的影响。结果表明，土壤全铜、全锌和全镉因秸秆还田或施用紫云英、猪粪有明显提高，尤其是施用猪粪，土壤全铜、全锌和全镉较仅施用氮、磷、钾肥分别增长53.6%、23.6%、406.2%，达到极显著水平； 而全铁和全锰各处理间没有显著差异。长期施用有机肥增加了土壤有效态铜、锌和镉含量，其中施用猪粪土壤有效铜、锌和镉含量增加最为显著，分别比NPK处理增长了335.9%、320.8%、421.4%。长期施用猪粪明显地增加了糙米中镉含量，并超过国家卫生标准。长期施用畜禽粪便类的有机肥对农产品的安全应予以足够的关注。

关键词： 长期施用有机肥 土壤 糙米 微量元素

Abstract： A long-term fertilization experiment, designed to have five application treatments of same rates of N, P, K, with or without incorporation of different organic fertilizers to the field, was carried out to determine the effects of these treatments on the concentrations of Cu, Zn, Fe, Mn, and Cd in soil and brown rice. Results showed that soil total Cu, Zn and Cd concentrations in the treatments with incorporation of rice straws (NPKS), 2 folds rice straws (NPKS2), Chinese milk vetch (NPKG) and pig manure (NPKM) were higher than those in the treatment with only application of N, P and K fertilizer (NPK). Compared with the treatment NPK, soil total Cu, Zn and Cd in the treatment NPKM increased by 53.6%, 23.6%, and 406.2%, respectively; however, no significant difference was observed from each other in total soil Fe and Mn concentrations. Likewise, long-term application of organic fertilizers increased available soil Cu, Zn and Cd in the treatments NPKS, NPKS2, NPKG and NPKM. Especially for the NPKM treatment, available soil Cu, Zn and Cd concentrations significantly increased by 335.9%, 320.8%, and 421.4%, respectively, compared with the treatment NPK. The Cd concentrations in brown rice in the treatments NPKS, NPKS2, NPKG and NPKM were higher than the upper limit (> 0.20 mg/kg) of the National Standard for Food Hygiene for Rice Cd concentration. In order to guarantee food safety, much attention should be paid to long-term application of organic fertilizer such as animal manure to the field.

Keywords： long-term application of organic fertilizer;soil rice micronutrient

Received 2009-01-20;

Fund:

国际合作重点项目（2005DFA31100）； 863课题（2008AA06Z307）； 国家科技支撑计划（2006BAD25B03）资助。

引用本文:

李本银, 黄绍敏, 张玉亭, 周东美, 吴晓晨, 沈阿林, 徐建明, 李忠佩.长期施用有机肥对土壤和糙米 铜、锌、铁、锰和镉积累的影响[J] 植物营养与肥料学报, 2010,V16(1): 129-135

LI Ben-Yin, HUANG Shao-Min, ZHANG Yu-Ting, ZHOU Dong-Mei, WU Xiao-Chen, SHEN A-Lin, XU Jian-Ming, LI Zhong-Pei.Effect of long-term application of organic fertilizer on Cu, Zn, Fe, Mn and Cd in soil and brown rice[J] Acta Metallurgica Sinica, 2010,V16(1): 129-135

Service

把本文推荐给朋友

加入我的书架

加入引用管理器

Email Alert

RSS

作者相关文章

李本银

黄绍敏

张玉亭

周东美

吴晓晨

沈阿林

徐建明

李忠佩