

有机物料对酸性红壤铝毒的缓解效应

吕焕哲^{1,3};王凯荣^{1,2};谢小立¹;王开峰¹

1.中国科学院亚热带农业生态研究所桃源农田生态系统国家野外科学观测研究站 湖南长沙410125; 2.青岛农业大学农业生态与环境健康研究所 青岛266109; 3.中国科学院研究生院 北京100039

Alleviation of organic manure on aluminum toxicity in acid red soil

Lü Huan-zhe^{1,3};WANG Kai-rong^{1,2};XIE Xiao-li¹;WANG Kai-feng^{1*}

1 National Observation Station of Taoyuan Agro-ecology System; Institute of Subtropical Agriculture; CAS; Changsha 410125; China; 2 Institute of Agriculture Ecological and Environmental Health; Qingdao Agricultural University; Qingdao 266109; China; 3 The Graduate

[摘要](#)[参考文献](#)[相关文章](#)Download: [PDF \(474KB\)](#) [HTML 0KB](#) Export: [BibTeX](#) or [EndNote \(RIS\)](#) [Supporting Info](#)

摘要 利用盆栽试验研究了施用不等量稻草对酸性红壤旱耕地铝毒的缓解效应。结果表明,添加不等量的秸秆碳(C)后,土壤pH值显著提高,土壤交换性铝和吸附态羟基铝的含量则明显降低,土壤有机络合态铝的含量也呈增加趋势。添加铝盐并不影响秸秆碳对降低土壤交换性铝和吸附态羟基铝含量的作用。在本研究中,土壤pH值与土壤交换性铝和土壤吸附态羟基铝均呈显著负相关,方程分别为 $y = -2193.9x + 11545, R^2 = 0.9798^{**}$, $y = -655.34x + 9748, R^2 = 0.7837^{**}$ 。土壤交换性铝和吸附态羟基铝与玉米主根长,地上部磷、钾含量均呈显著负相关,是抑制玉米吸收养分的主要限制因素,土壤吸附态羟基铝是次于交换性铝的又一活性较大的铝化合物。

关键词: 酸性红壤 有机物料 交换性铝 吸附态羟基铝 有机络合态铝 酸性红壤 有机物料 交换性铝 吸附态羟基铝 有机络合态铝

Abstract: Aluminum is the most abundant metal that makes up 7% of the earth's crust and occurs in a number of different forms in the soil. If the soil pH < 5 or even 5.5, as is now the case accounted for 40% of the arable lands in the world, the harmless oxides and aluminosilicates could be solubilized into toxic forms, generally referred to Al³⁺, which is a primary factor limiting plant growth. A possible alternative to ameliorate Al toxicity is the application of organic manure such as rice straw. A pot experiment was conducted to investigate the alleviation of straw on aluminum toxicity in acid red soil. The result revealed that adding 0.5%, 1% and 1.5% organic straw carbon significantly increased soil pH value and active exchangeable aluminum; while decreased adsorbent hydroxy aluminum. Soil pH negatively correlated with soil exchangeable aluminum and adsorbent hydroxyl aluminum, with the correlation equations being $y = 2193.9x + 11545, R^2 = 0.9798^{**}$ and $y = -655.34x + 9748, R^2 = 0.7837^{**}$ respectively. Soil exchangeable aluminum and adsorbent hydroxyl aluminum were significantly negative correlated to root length and P and K content in the ground parts. It is the main limiting factor controlling nutrients uptake.

Keywords:

引用本文:

吕焕哲^{1,3};王凯荣^{1,2};谢小立¹;王开峰¹. 有机物料对酸性红壤铝毒的缓解效应[J] 植物营养与肥料学报, 2007, V13(4): 637-

Lü Huan-zhe^{1,3};WANG Kai-rong^{1,2};XIE Xiao-li¹;WANG Kai-feng¹. Alleviation of organic manure on aluminum toxicity in acid red soil[J] Acta Metallurgica Sinica, 2007, V13(4): 637-

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](#)