

南方酸性旱坡地桔园有机无机肥料配合施用效应研究

徐培智, 解开治, 陈建生, 杨少海, 张发宝, 唐拴虎, 黄旭, 顾文杰

广东省农业科学院土壤肥料研究所, 广东省养分资源循环利用与耕地保育重点实验室, 广东广州510640

Effects of organic and inorganic fertilizers on sloping-land citrus orchards with acid soils in Southern China

XU Pei-zhi, XIE Kai-zhi, CHEN Jian-sheng, YANG Shao-hai, ZHANG Fa-bao, TANG Shuan-hu, HUANG Xu, GU Wen-jie*

Soil and Fertilizer Research Institute, Guangdong Academy of Agricultural Sciences/Guangdong Key Laboratory of Nutrient Cycling and Farmland Conservation, Guangzhou 510640, China[摘要](#)[参考文献](#)[相关文章](#)Download: [PDF \(796KB\)](#) [HTML 1KB](#) Export: [BibTeX](#) or [EndNote \(RIS\)](#) [Supporting Info](#)

摘要 通过2年定位试验研究了有机无机肥料配施对南方旱坡地果园柑桔(沙糖桔)产量和品质的影响,并比较了土壤可培养微生物数量、土壤微生物碳、氮、柑桔根际土壤活性铝含量及柑桔根系铝含量的变化。结果表明,与100%化肥处理(CK)相比,20%有机肥+80%化肥(T₁)、40%有机肥+60%化肥(T₂)、100%有机肥(T₃)处理的细菌、放线菌、真菌数量均显著提高,平均分别是对照的1.30、1.40、1.46倍;土壤微生物量碳、氮显著增加,其中T₃处理的土壤微生物量碳、氮分别增加45.6%、63.3%。施用有机肥后,活跃了土壤中的微生物种群,改善了土壤的生物学质量。施用有机肥可缓解旱坡地柑桔园根际土壤铝毒的危害,显著减少柑桔根系对土壤铝的吸收累积。尤其是T₃处理,根际土壤活性铝含量较CK有大幅度的降低,降幅达到77.4%。施用有机肥明显地促进了柑桔根系的生长发育,提高果实产量和品质,沙糖桔平均增产率18.5%,增产效果显著。

关键词: 旱坡地柑桔园 有机肥 化肥 配施效应

Abstract: Fixed orchard trials were conducted to investigate the effects of different combinations of organic and inorganic fertilizers on fruit yield and quality of sloping-land citrus, and to analyze and compare the changes among the various treatments in quantity of soil culturable microorganism, C and N of soil culturable microorganism, content of active aluminum in rhizosphere and content of aluminum in citrus roots. The results indicate that quantities of bacteria, actinomycetes and fungi under the treatments of 20% organic manure + 80% chemical fertilizers (T₁), 40% organic manure + 60% chemical fertilizers (T₂), and 100% organic manure (T₃) are significantly increased, and which are about 1.30, 1.40 and 1.46 times of those under the 100% chemical fertilizer treatment (CK) in average. The amounts of carbon and nitrogen of soil microbial biomass are significantly increased in the treatments with organic manure, and the amounts under the T₃ treatment are increased by 45.6% and 63.3% compared with the CK. These indicate that the application of organic manure should flourish the communities of soil microorganisms and thus improve soil biological quality. It is observed that the application of organic manure can mitigate the influence of aluminum toxicity through significantly reducing root absorption and accumulation of aluminum from the soil, and in particular, under the T₃ treatment, active aluminum content of rhizosphere is significantly decreased by 77.4% compared with the CK. The application of organic manure can promote the growth of root system, increase fruit yield, and ameliorate fruit quality of citrus significantly, with an average yield increase up to 18.5% over the CK.

Keywords:

Received 2009-07-02:

Fund:

国家“十一五”科技支撑计划“沃土工程关键支撑技术研究”(2006BAD25B08-2); 国家“十一五”科技支撑计划(2007BAD89B14)资助。

引用本文:

徐培智, 解开治, 陈建生, 杨少海, 张发宝, 唐拴虎, 黄旭, 顾文杰. 南方酸性旱坡地桔园有机无机肥料配合施用效应研究[J] 植物营养与肥料学报, 2010, V16(3): 650-655

XU Pei-Zhi, XIE Kai-Zhi, CHEN Jian-Sheng, YANG Shao-Hai, ZHANG Fa-Bao, TANG Shuan-Hu, Huang-Xu, GU Wen-Jie. Effects of organic and inorganic fertilizers on sloping-land citrus orchards with acid soils in Southern China[J] Acta Metallurgica Sinica, 2010, V16(3): 650-655

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

- ▶ [徐培智](#)
- ▶ [解开治](#)
- ▶ [陈建生](#)
- ▶ [杨少海](#)
- ▶ [张发宝](#)
- ▶ [唐拴虎](#)
- ▶ [黄旭](#)
- ▶ [顾文杰](#)

