

土壤养分状况系统研究法在菠菜平衡施肥上的应用

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Application of ASI systematic approach on balanced fertilization of spinach

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摘要 利用ASI土壤养分状况系统研究法研究平衡施肥对菠菜产量和品质的影响。结果表明,海南花岗岩砖红壤土壤养分为缺钙>缺氮>缺铜;随着施氮量的增加,菠菜产量提高,体内的硝酸盐含量增加;氮肥施用量与硝酸盐含量呈正相关关系(化学氮肥 $r=0.9876$,有机氮肥 $r=0.8175$)。氮肥用量超过ASI系统研究法的推荐用量,硝酸盐积累量达显著水平。在最佳施氮量情况下,(尿素 $240\text{kg}/\text{hm}^2$)随施钙量的增加,菠菜产量增加。ASI土壤系统研究法推荐的施钙处理叶片硝酸盐积累量最低,硝酸还原酶活性随钙用量的增加而提高。试验施用钾和镁肥对菠菜产量有负效应,且菠菜硝酸盐的积累量增加。ASI土壤养分状况系统研究法的诊断结果与菠菜产量和品质的提高具有较好的相关性,对菠菜平衡施肥有一定的指导作用。

关键词: 土壤养分状况系统研究法 菠菜 平衡施肥 硝酸盐积累 土壤养分状况系统研究法 菠菜 平衡施肥 硝酸盐积累

Abstract: In this experiment, the yield and quality of spinach (*Spinacia oleracea*) were studied by means of ASI systematic approach. Experiment results indicated that calcium deficit was the most dominant limiting factor, followed by nitrogen and copper in the laterite derived from granite in Hainan. There was a positive correlation between the rate of N application and accumulated nitrate in spinach (chemical nitrogen fertilizer $r=0.9876$, organic nitrogen fertilizer $r=0.8175$). Yield and accumulated nitrate increased with the augment of nitrogen fertilizer application rate. Accumulated nitrate reached a significant level when the N fertilizer application rate exceeded the recommended rate by ASI. Under optimum fertilizer rate of nitrogen (urea $240\text{ kg}/\text{ha}$), the yield of spinach increased with the increase of Ca application rate. The nitrate content of spinach of calcium treatment recommended by ASI system was the lowest. Under the condition of this experiment, the application of magnesium showed a negative effect. The application of K fertilizer showed a negative effect as well. Accumulated nitrate content of spinach increased with the increasing of magnesium and potassium fertilizer. There was a preferable correlation between the yield and quality of vegetable and diagnosis results of ASI systematic approach. Therefore, ASI systematic approach could be applied on spinach balanced fertilization.

Keywords:

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