

南方典型菜地土壤速效养分时空变异特征研究—以岳阳市君山区广兴洲镇为例

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Study on spatio-temporal variability of soil available nutrients in typical vegetable field of South China: A case study at Guangxingzhou, Junshan, Yueyang

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摘要 在夏季和冬季运用网格法采取耕层土, 测定土壤速效氮磷钾含量, 并运用经典统计方法及地统计方法进行分析。结果表明: 1) 不同季节土壤速效氮、磷、钾含量均符合正态分布, 并且在不同季节大致保持总量平衡, 但8月份变异系数比12月份大。2) 在同一季节中, 3种速效养分间彼此显著相关, 而且氮磷之间的相关性大于氮钾、磷钾之间的相关性。土壤速效氮、磷、钾之间存在比较好的比例关系, 在不同季节基本保持稳定, 受茬口影响不大; 速效养分季节变化量间也存在显著性相关关系, 其中速效磷变化量与速效钾变化量间相关关系的决定系数最大。不同季节同种速效养分含量间相关性极显著, 但速效氮的相关系数最小, 表明速效氮含量随季节产生的趋势性变化不如速效磷、钾明显。3) 不同季节不同速效养分均具有明显的空间变异结构。12月份速效氮含量的空间变异函数为球形模型, 其他指标为指数模型; 8月份速效磷含量空间相关性弱, 其他指标空间相关程度中等。速效氮空间相关性不同季节相对稳定, 最大相关距稳定在450 m; 速效磷和速效钾变异结构参数随着季节变化而变化, 半方差的结构系数12月份明显大于8月份, 8月份最大相关距分别为497和413 m, 12月份最大相关距分别为141和157 m。

关键词: 土壤, 速效养分, 时空变异, 菜地 土壤, 速效养分, 时空变异, 菜地

Abstract:

The available nutrients (N, P and K) in the soil, collected in the cultivate layer using grid sampling method in summer and winter, was tested and the data were analyzed with classical and geography statistical methods. The result showed: 1) The available N, P and K in two seasons conformed to normal distribution, and almost remained constantly in different seasons, but coefficients of variation of all indexes was larger in August than in December. 2) The available nutrients were significantly correlative in same season, and the coefficient of determination between available N and P was larger than the others. There was steady proportion among available nutrients, being little influenced by the rotation of crops. The change of available nutrients between different seasons were significantly correlative, among which the coefficients of determination between ΔP and ΔK was largest. The available N in different seasons were also significantly correlative, the coefficients of correlation of available N was smallest, which means the change trend of available N in different seasons was not as significant as the other two available nutrients. 3) Available nutrients in deferent seasons had strongly spatial structure, the semivariance function of available N in December could be defined as spherical model while the other function could be defined as potential model. The spatial dependence of available nutrients was moderate except those of available P in August, which was weak. The spatial variability of available N was correspondingly steady in different seasons, the maximum correlative ranges stabilized at 450 meters, the spatial variability of available P and K in December was larger than that in August. The maximum correlative ranges for avail. P and available K were 497 and 413 meters in August, and 141 and 157 meters in December respectively.

Keywords:

Received 2008-04-21;

引用本文:

王豹^{1, 2}, 龙怀玉^{2*}, 诸葛玉平¹, 张建国¹, 巩永凯². 南方典型菜地土壤速效养分时空变异特征研究—以岳阳市君山区广兴洲镇为例 [J] 植物营养与肥科学报, 2009, V15(3): 551-558WANG Bao^{1, 2}, LONG Huai-yu², ZHUGE Yu-ping¹, ZHANG Jian-guo¹, GONG Yong-kai². Study on spatio-temporal variability of soil available nutrients in typical vegetable field of South China: A case study at Guangxingzhou, Junshan, Yueyang [J] Acta Metallurgica Sinica, 2009, V15(3): 551-558

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