

## 土壤速效养分空间变异的尺度效应

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## Scale-dependency of spatial variability of soil available nutrients.

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## 摘要

在GIS技术支持下,运用经典统计学和地统计学的方法,从经典统计分析、变异函数和Kriging插值图等方面探讨了禹城市耕地土壤速效磷(AP)、速效钾(AK)在县级和镇级两个不同采样尺度下的空间变异特征.结果表明:在两个采样尺度下,AP、AK都服从对数正态分布,它们的变异系数范围为26.5%~36.6%,均属中等变异强度,随着采样尺度的缩小,土壤AP、AK的变异系数都增大.两个采样尺度下,土壤AP和AK均在一定范围内存在空间相关关系,县级采样尺度下土壤AP和AK的空间自相关距离较大,分别为9.0 km和26.5 km,镇级采样尺度下土壤AP和AK的空间自相关距离明显变小,分别为1.7 km和2.8 km.两个采样尺度下的土壤AP和AK受结构性因素和随机性因素的影响,表现出明显不同的分布规律.

**关键词:** 土壤 空间异质性 尺度效应 速效养分

## Abstract:

With the support of GIS and by using classical statistics and geostatistics methods, the spatial variability of soil available P (AP) and available K (AK) in cultivated lands in Yucheng City of Shandong Province was approached at county and township scales. The results showed that both the soil AP and AK followed the logarithmic normal distribution, with the coefficient of variation (CV) at the two scales being 26.5%-36.6% and presenting a moderate variation. With the decrease of the scale, the CV of the soil AP and AK increased. Both the soil AP and AK were spatially correlated with scale. At county scale, the soil AP and AK had a larger spatial correlation distance, being 9.0 km and 26.5 km, respectively; while at township scale, the soil AP and AK had a smaller spatial correlation distance, being 1.7 km and 2.8 km, respectively. The spatial distribution of the soil AP and AK at the two scales was obviously different, which was mainly affected by structural factors and random factors.

**Key words:** soil spatial variability scale-dependency available nutrient

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