

研究论文

不同尺度下低山茶园土壤有机质含量的空间变异

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收稿日期 2004-12-27 修回日期 2005-6-13 网络版发布日期: 2006-2-25

摘要 南方低山丘陵区是我国茶园集中分布的区域, 研究其土壤特性的空间变异性, 尤其是有机质的空间分布特性, 可以为实施低山丘陵茶园土壤养分精准管理提供依据。以四川蒙顶山茶园为研究对象, 利用地统计学方法, 在两个尺度下对其土壤有机质含量的空间变异性进行了研究。结果表明: (1) 小尺度下, 蒙顶山茶园土壤有机质含量具有中等空间相关性(C_0 与 C_0+C 的比值为49.9%), 空间相关距离达到了894m, 随机性和结构性因子对有机质含量空间变异的影响各占一半; 茶园土壤有机质含量在坡体垂直方向的变异性较强, 在坡体水平方向上的变异较弱; 普通Kriging插值分析说明有机质含量从东北至西南呈明显的带状分布, 垂直方向上随海拔升高而增加。(2) 微尺度下, 代表性茶园土壤有机质含量具有强烈的空间相关性(C_0 与 C_0+C 的比值为4.1%), 空间相关距离达到了311m, 结构性因子是影响其空间变异的主要因素; 各向异性分析, 茶园土壤有机质含量也在坡面垂直方向变异较强, 且在坡面倾斜45°方向也存在一定变异; 普通Kriging分析, 坡面由上到下有机质含量逐渐增加。

关键词 [空间变异](#) [地统计学](#) [有机质](#) [茶园土壤](#)

分类号 [Q143, S153.6](#)

The spatial variability of the content of organic matter in hilly tea plantation soils with different sampling scales

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Abstract The hilly region of Southern China is the main area where the tea plantations are distributed in our country. Studies of the spatial variability of soil properties, especially of the organic matter (OM), is helpful for the precision agriculture. The Mengding tea plantation in Sichuan Province was used as the subject of this paper. Geostatistics were used for the analysis of the spatial variability of OM in this tea plantation with two sampling scales. In the tea plantation at the small scale, the result analyzed by semivariograms indicated that the OM content was moderately spatially dependent, the rate of nugget to sill was 49.9%, The range of spatially dependent OM was 894 m, and both structural factors and the random factors equally affected the spatial variability of the OM content. The OM content had a stronger anisotropic structure in the aspect of the slope, and a weaker one at the acclinic aspect of the slope. According to the Ordinary Kriging method the equivalence of the OM content was distributed along the acclinic aspect of the slope from northeast to southwest, and the OM content was reduced as the elevation went down. In the representative tea plantation at the micro scale, the result analyzed by semivariograms indicated that the OM content was strongly spatially dependent, because the rate of nugget to sill was 4.1%. The range of spatially dependent for OM was 311m, and the spatial variability of the OM content was fundamentally affected by structural factors, It had a stronger anisotropic structure in the aspect of the slope and in the aspect of 45° with the acclinic aspect of the slope. The Ordinary Kriging method showed that the OM content increased from the top of the tea plantation to the bottom.

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Key words [spatial variability](#) _ [geostatistics](#) _ [organic matter](#) _ [tea plantation soil](#)

DOI

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