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农学—研究报告

小尺度下浓香型烟区土壤微量元素的空间变异性

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摘要：

平顶山郏县地区是中国浓香型烤烟的主要分布区，微量元素对烤烟品质具有十分重要的影响，研究其空间变异特征是实现该地区烤烟精准栽培管理的基础。本研究利用地统计学方法对平顶山烟区土壤微量元素空间变异性进行了分析，并绘制微量元素空间分布图进行研究。结果表明：（1）描述性统计所得变异系数在13.49%（有效铜）~36.51%（有效锌）之间，四种微量元素数据均为正态分布；（2）球状模型为土壤微量元素的最佳拟合模型，各元素的块金值、最大相关距离及块金值与基台值比分别在0.01~4.66，34.3~376.3 m，13.61%~49.99%之间；（3）各向异性分析表明，四种土壤微量元素都有一定程度的各向异性，有效铜和有效铁的各向异性较大，而有效锰和有效锌则较小；（4）Kriging插值结果显示人为因素等随机作用对有效锌的空间分布影响较大，土壤有效铁、铜和锰的空间分布则主要有成土母质等结构性因素决定。通过对研究区域土壤中4种微量元素的统计特征和空间变异性分析，为进一步合理地进行烟田规划提供了理论依据，并为烟田土壤养分分区管理和土壤改良具有一定的指导意义。

关键词： 烟草；微量元素；空间变异性；地统计学

Spatial Variability of Microelements in Full-aroma Type Tobacco Plantation Area on Small-scale

Abstract:

PingDingShan district is the main area where the full aroma type tobacco is distributed in China. The soil microelements are very important to the quality of flue-cured tobacco. Study on the spatial variability of soil microelements in tobacco plantation soils is the foundation of precision agriculture. In this study, the geostatistics analysis is used to analyze the spatial variability of soil microelements in PingDingShan area, and the interpolation map of soil microelements are made for analysis the spatial distributions. The result showed: (1)The CVs from mathematical statistics were between 13.49% (available Cu)and 36.51% (available Zn), and the four microelements are meet the normal distribution. (2)The spherical models are the optimal models that showed the spatial variability of microelements. The nuggets, ranges and the rations of Co/Co+C of all tested microelements contents are between 0.01~4.66, 34.3~376.3 m, 13.61%~49.99%, respectively. (3)The anisotropy analysis showed that the four kinds of soil microelements have a certain degree of anisotropy, the anisotropy of available copper and iron are more, and the available manganese and zinc are less. (4)The interpolation maps of the soil microelements with Kriging showed that there were strong effects of random effects (human’s action) action on the spatial variability of available Zn. The spatial distributions of available Fe, Cu and Mn contents were decided by structural factors (soil parent materials) in PingDingShan district. The research on the statistical characters and the semivariance structure of the 4 microelements can provide scientific basis for using reasonable of tobacco plantation field, and provide the guidelines for management of soil nutrients, soil amelioration and cultivation.

Keywords: tobacco microelements spatial variability geostatistics

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