农田土壤养分的空间变异性特征

Spatial Variability of Soil Nutrient in Wheat Field

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中文摘要：

对一块面积为１ｈｍ^{2}麦田内的９８个观测点取样分析，测定了代表不同土壤含水率水平下的两个时期土壤表层和底层的ＮＨ$_4$-Ｎ、ＮＯ$_3$-Ｎ、Ｏｌｓｅｎ-Ｐ、表层有机质和全氮等养分。应用地统计学的方法对所取的数据进行了分析，结果表明底层土壤的ＮＨ$_4$-Ｎ、表层土壤的有机质服从正态分布；其余养分基本上服从对数正态分布；按一定的精度和置信水平确定了合理的取样数目。通过半方差函数分析，发现这些养分在一定范围内存在空间相关性；采用Ｋｒｉｇｉｎｇ方法对未测点进行了估值，绘制了等值线图，并对两个时期的养分动态的空间变异进行了初步分析。该成果可用于提高氮肥利用率和精确农业（施肥）的研究和实践。

英文摘要：

Ninety eight observing points by a square of 10m×10m were made in a wheat field approximate 1 hm^2. Soil samplers were obtained from each point under two layers of 0～20 cm and 80～100cm with different soil moisture and different time. Ammonia、NO$_3$-N、Olsen-P in the soils of 0～20 cm and 80～100 cm, organic matter and total-N in surface soil (0～20 cm) were measured. The geostatistics theory was applied to analyze the data, the results indicated that both NH$_4$-N in bottom soil and organic matter in surface soil showed a normal distribution, others with a lognormal distribution. The rational sample number was determined within a given precision at a known confidence level. Semivariance analysis gave that those nutrients were correlated in a given spatial range. The Kriging method was applied to calculate the unobserved points and generate the contour map. Preliminary analysis was made for the spatial dynamic variability of those nutrients in different time. These results shows some merit in increasing nitrogen use efficient and precision agriculture.

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