

小麦拔节期农学参数和土壤含水量空间统计 Spatial Statistic Properties of Agronomic Parameters and Soil Moisture Content in Wheat Jointing Stage

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摘要: 选取山东省陵县的小麦试验示范基地作为样区,采用GPS定位调查,获取田间21个样点的土壤和小麦植株样品,运用TDR300测定样点土壤含水量,利用SPAD-502叶绿素仪测定采样点拔节期小麦植株叶片的叶绿素含量,获取小麦干物质产量信息。基于地统计学原理,结合空间分析技术,探讨了小麦叶绿素含量、干物质产量等农学参数信息和土壤含水量的空间变异特征。研究表明,土壤水分和小麦叶绿素含量的空间变异呈强的空间相关性,结构性因素引起的空间变异分别占到总变异97.3%和81.3%。小麦干物质产量具有中等程度的空间变异性,由结构性因素引起的变异占到总变异的50%。土壤含水量、小麦叶绿素含量Kriging插值空间分布呈现明显的片状和斑块状特点,小麦干物质产量Kriging空间分布具有明显的带状分布特点。The experimental area was selected in Lingxian County of Shandong Province. Based on the GPS positioning data, soil moisture content, chlorophyll content and wheat dry matter production was measured. Geostatistical analysis was conducted combined with geographical information system (GIS) and the semivariogram models were established. It was found that a spherical model fit semivariogram model of soil moisture content better, and a Gaussian model was the better model for wheat chlorophyll content and dry matter production. The results showed soil moisture content and wheat chlorophyll content had the strong spatial autocorrelation, and the ratio of structural variation was 97.3% and 81.3%. Wheat dry matter production has the medium spatial autocorrelation, and the structural variation was 50%. Block Kriging was applied, and the spatial distributing maps and maps of standard deviation of Kriging estimates were drawn. From the distribution types, it was observed that the Kriging estimates maps of soil moisture content and wheat chlorophyll content had obvious slabby and plaques characteristics while the map of wheat dry matter production had ribbon characteristics.

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