

## 基于决策树和图层叠置的精准农业产量图分析方法

### Yield mapping analysis methods in precision agriculture based on decision-making tree modeling and map-overlapping

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英文关键词: precision agriculture; yield-map analysis; decision-making tree; map overlay

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中文摘要:

作物产量限制因子的提取是精准农业变量施肥的重要环节之一。决策树和GIS图层叠置方法研究结果表明, 土壤有机质始终占据决策树全部知识规则的第一次分支, 起着重要的决定性作用, 其次为速效磷和碱解氮; 产量空间分布与有机质、碱解氮、速效磷高度吻合, 平均吻合度分别达到91%、83%和49%。土壤有机质、速效磷和碱解氮含量是宁夏暖泉农场小麦产量主要限制因子, 提高土壤有机质含量是提高单产的重要措施。结论得到生产实际验证, 说明运用决策树和GIS图层叠置分析方法挖掘产量限制因子在技术上可行。

英文摘要:

As one of the important steps, analysis of crop yield-limiting factors plays an important role in variable-rate fertilization of precision agriculture. The results based on decision-making tree and GIS overlay analysis show that the soil organic matter always holds the first place in all knowledge rules, P and N rank the second. It is obvious that the yield spatial distribution with organic matter, N and P have high superposition, and the superposition rates are 91%, 83% and 49%, respectively. The experiments on Nuanquan Farm, Ningxia Hui Autonomous Region also display that soil organic matter, P and N are the main yield limiting factors for wheat in this area, thus increasing soil organic matter would be an important measure for increasing wheat yield. It is believable that the method of analysis yield-limiting factors based on the decision-making tree and GIS overlay is practical in similar areas like Ningxia according to the theoretical research and its application.

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