# 基于时间序列NDVI相似性分析的棉花估产

## Cotton yield estimation based on similarity analysis of time-series NDVI

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**中文摘要：**

　　多时相遥感数据能比单一时相反映更多的作物产量信息，挖掘多时相遥感信息以提高作物估产精度具有重要意义。该文以新疆生产建设兵团农一师一团的棉花为研究对象,提出了一种融合分区概念和时间序列NDVI（归一化植被指数）相似性分析的棉花估产方法。首先，通过植被指数与产量的相关性比较分析，确定NDVI为棉花估产因子，在此基础上根据棉花品种和土壤条件的差异，将研究区棉田划分为不同类型的生长区；然后，结合每个生长区获取的样点产量数据，确定各生长区时序NDVI估产模型的拟合系数；最后，融合距离与角度相似算法，对各生长区内所有棉花像元的时序NDVI数据构成的向量与产量样点对应的时序NDVI向量进行相似性分析，确定待测棉田像元最佳的估产模型，实现对整个棉田区域棉花产量的遥感估测。结果表明，基于分区和时序NDVI相似性分析的棉花产量预测值与实测值决定系数达到0.77，该方法具有较好的操作性和适用性。

**英文摘要：**

　　Multi-temporal remote sensing images contain more crop yield information than mono temporal images, and it is very significant to mine information from multi-temporal remote sensing data for improving the precision of crop yield estimation. In the paper, taking the cotton field of First Regimental, Agriculture First Division, Xinjiang Production and Construction Corps as the studying area, a method of cotton yield estimation was proposed by integrating the concept of cotton growing area with similarity analysis of time-series NDVI data. Firstly, the NDVI was determined as the dominant factor of cotton yield estimation through correlation analysis between vegetation index and cotton yield from all sampled plots. Secondly, the whole studying area was divided into several cotton growing areas according to cotton variety and soil condition. And then the linear-fitting analyses were used to acquire the coefficient of yield model for each growing area. Finally, multiple linear regression coefficients for each cotton pixel were determined by similarity analysis between NDVI vectors from unknown-yield cotton pixels and all known ones as the investigated yields. Thus, cotton yield estimation throughout the whole studying area was realized by time-series NDVI data. The analyses show that the coefficient?of determination (R2) between the estimated and investigated yield can reach to 0.77, which indicates that the method is reasonable and adaptable.

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