

研究论文

## 利用冠层反射光谱预测小麦籽粒品质指标的研究

薛利红, 曹卫星, 张宪, 朱艳

南京农业大学农业部作物生长调控重点开放实验室, 江苏南京 210095

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**摘要** 以两个专用小麦品种为材料, 系统分析了小麦花后冠层反射光谱特征和籽粒品质形成的动态变化规律以及两者之间的关系。结果表明, 花后冠层光谱反射率在可见光波段逐渐升高, 而在近红外波段逐渐降低。开花期反射光谱与籽粒品质指标相关较好, 但用来直接预测籽粒品质还存在一定的局限性。由于反射光谱能可靠推断叶片氮素状况, 而叶片氮素状况与籽粒蛋白质含量、干湿面筋含量相关极显著, 因此可以用冠层光谱指数来间接预测籽粒品质指标, 其中籽粒蛋白质含量的预测值和实测值之间的决定系数 ( $R^2$ ) 达0.88。说明通过遥感手段来预测小麦籽粒品质指标是可行的。

**关键词** [普通小麦](#) [冠层反射光谱](#) [叶片氮素状况](#) [籽粒品质](#)

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## Predicting Wheat Grain Quality with Canopy Reflectance Spectra

XUE Li-Hong, CAO Wei-Xing, ZHANG Xian, ZHU Yan

Key Laboratory of Crop Growth Regulation, Ministry of Agriculture, Nanjing Agricultural University, Nanjing 210095, Jiangsu

**Abstract** Dynamic trends of canopy spectral reflectance and grain quality formation, and their relationships in two wheat cultivars were analyzed. The results showed that reflectance increased at visible bands while decreased at NIR bands after flowering. Canopy spectra at flowering were best related to grain quality index, but the prediction of grain quality index using the relationship was not satisfied. Leaf nitrogen status was closely related to grain protein content, wet and dry gluten content in wheat, and it could be reliably estimated from canopy spectra. Thus, canopy spectra can be used to indirectly predict grain quality index. The fitness of estimated and tested grain protein content was good with  $R^2$  of 0.88. This indicates that it is feasible to predict grain quality index in wheat by using remote sensing technique.

**Key words** [Wheat](#); [Canopy reflectance spectra](#); [Leaf nitrogen status](#) [Grain quality](#)

DOI:

通讯作者 曹卫星 [caow@njau.edu.cn](mailto:caow@njau.edu.cn)

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