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不同气候和土壤条件下玉米叶片叶绿素相对含量对土壤氮素供应和玉米产量的预测

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Prediction of soil nitrogen supply and maize yields with the relative chlorophyll contents of leaves under different climates and soil conditions

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摘要 叶绿素仪可以用于估测作物和土壤氮素供应状况，本研究通过野外土壤置换试验评估叶绿素仪在不同区域的适用性。在黑龙江海伦（中温带）、河南封丘（暖温带）和江西鹰潭（中亚热带）设置3种主要农田土壤（黑土、潮土、红壤）的异地置换对比试验，研究了不同气候和土壤条件下玉米叶绿素相对含量对土壤氮素供应的响应及其对玉米产量的预测性。研究结果表明：不同气候和土壤条件下，玉米生长旺盛期功能叶的叶绿素相对含量（叶绿素仪SPAD值）和土壤表层（0—20 cm）硝态氮、无机氮含量相关性显著，说明叶绿素仪测定值可以在玉米生长旺盛期反应土壤氮素供应情况；玉米生长旺盛期功能叶叶绿素相对含量和土壤表层硝态氮含量均与玉米子粒产量呈显著相关，说明叶绿素仪可以在玉米生长旺盛期估测玉米子粒产量，且不受地域、土壤类型的影响。

关键词： 玉米 叶绿素相对含量 产量 土壤氮素供应 土壤置换试验 玉米 叶绿素相对含量 产量 土壤氮素供应 土壤置换试验

Abstract：

Chlorophyll meters are often used to evaluate nitrogen status of crops and soils. Soil replacement experiments were carried out in fields to evaluate the promising application of Chlorophyll meter to different climate zones, which represents three different soils, namely, Phaeozem, Cambisol and Acrisol in Hailun (middle temperate zone), Fengqiu (warm temperate zone) and Yingtan (Mid-subtropical zone) Agricultural Experimental Stations, respectively. The relationships between chlorophyll meter readings of maize leaves and soil inorganic nitrogen contents and maize yields were studied. The results show that there are significant correlations between chlorophyll meter (SPAD) readings and soil nitrate nitrogen contents, soil inorganic nitrogen and maize yields at the prosperous stage of maize. These results indicate the chlorophyll meter can be used to evaluate soil nitrogen availability and corn yields at corn prosperous stage, which are not affected by climate and soil variety.

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