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研究论文

水稻叶氮量等生理参数的叶位分布特点及其与氮素营养诊断的关系

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摘要 以氮素营养特性差异较大的3个品种为材料，研究了水稻不同生育期顶部4片展开叶中叶片总氮、叶绿素和游离氨基酸及叶鞘总氮含量的叶位分布特点。各生育期叶片和叶鞘总氮含量均以顶1叶最高，而游离氨基酸和叶绿素的最高含量叶位随品种和生育期而异。抽穗前游离氨基酸的最高含量叶位随品种和生育期变化较大，而抽穗后以顶1叶含量最高。叶绿素含量抽穗前以顶2或顶3叶最高，抽穗后以顶2或顶1叶最高。叶片和叶鞘氮素含量与植株总氮含量呈极显著或显著正相关，均可较好地反映水稻植株氮素营养状况。顶1叶氮素含量的变异系数最小，顶2叶氮素含量与植株氮素含量的相关性最差，顶3叶和顶4叶氮素含量变异系数大，但因顶4叶个体间差异太大，不利取样，因此提出顶3叶作为水稻氮素营养诊断的最适宜叶位。

关键词 水稻 叶氮量 叶位分布 氮素营养 诊断叶位

分类号 S511

Distribution of Leaf Nitrogen, Amino Acids and Chlorophyll in Leaves of Different Positions and Relationship with Nitrogen Nutrition Diagnosis in Rice

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Abstract Field experiments with three rice genotypes, Baguixiang, Jinyou253 and Liangyoupeijiu, were conducted to study the distribution of leaf nitrogen, free amino acids and chlorophyll in the leaves of different positions. The results showed that the contents of nitrogen, free amino acids and chlorophyll in the 4 top full expanded leaves, nitrogen in leaf sheath exhibited different spatial distribution patterns in response to the leaf positions. The first leaf revealed the highest contents of nitrogen in leaf blade and sheath at all growth stages, yet the leaf position with the highest contents of free amino acids or chlorophyll changed with genotypes and plant developmental stages. Free amino acid content in the first leaf was the highest after heading, but this tendency varied widely before heading. The highest chlorophyll content was in the first or second leaf after heading, while in the second or third leaf before heading. Contents of nitrogen, free amino acids and chlorophyll in 4 top leaves were well correlated with plant nitrogen content and thus could reflect the nitrogen nutrition status in rice plant. Among the 4 top leaves, the first leaf revealed the least coefficient of variance in nitrogen content, while the second leaf indicated the worst correlation to plant nitrogen content. Though both the third and fourth leaf showed large coefficient of variance in nitrogen content, the third leaf was proposed as the ideal leaf position for nitrogen nutrition diagnosis in rice, because of the large difference in nitrogen content in the fourth leaves of rice population.

Key words Rice Leaf nitrogen Leaf distribution Nitrogen nutrition Leaf position for diagnosis

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