

研究论文

# 不同水、氮条件下水稻不同叶位水、氮含量及光合速率的变化特征

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**摘要** 本文研究了不同土壤水氮条件下, 水稻不同叶位含水率、含氮率、叶色和光合速率的动态变化特征。结果表明, 拔节至抽穗前后, 不同叶位含水率为顶1叶<顶2叶<顶3叶<顶4叶; 随胁迫时间的推移, 灌浆期后不同叶位水分变化趋势随水分处理而异, W3和W5同拔节至抽穗期, 而W1和W2表现相反(W1至W5为由低到高土壤水分处理)。不同叶位叶色随水分胁迫程度而表现不同, 拔节至抽穗期W1、W2、W3和W5基本一致, 为顶2叶>顶3叶>顶4叶, 而顶1叶总是小于顶2叶; 抽穗后, W1、W2为顶1叶<顶2叶<顶3叶<顶4叶, 而W3、W5则相反, 高氮和低氮处理趋势一致。不同叶位, 含氮量与叶色表现为一致的变化趋势。各处理的水稻叶片净光合速率变化趋势为顶1叶>顶2叶>顶3叶>顶4叶。土壤水分充足条件下, 不同叶位叶片净光合速率与叶片含水率呈线性负相关关系, 与叶片含氮量、叶色呈线性正相关关系; 而土壤水分胁迫条件下, 不同叶位叶片净光合速率与叶片含水率、含氮量和叶色均呈线性负相关关系。此外, 水稻下部叶片与上部叶片之间含水率、含氮量和光合速率的比值或差值与冠层叶片含水率、含氮量和净光合速率均呈显著的线性相关

**关键词** [水稻](#) [叶位](#) [叶片含水量](#) [叶色](#) [叶片氮含量](#) [光合速率](#)  
**分类号** [S511](#)

## Variation of Water and Nitrogen Contents & Photosynthesis at Different Position Leaves of Rice Under Different Soil Water and Nitrogen Conditions

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**Abstract** Water content, nitrogen content, leaf color and photosynthesis of each functional leaf on main stem of rice under different soil water and nitrogen conditions were investigated. Results showed that the distributions of leaf water contents on main stem in all treatments were L1L3>L4 before heading, but after heading, the trends were L1L3>L4 in W3 and W5. For leaf photosynthesis, the trends were L1>L2>L3>L4 in all treatments. Distribution trends of leaf nitrogen contents on main stem were the same as that of the leaf color under high and low soil nitrogen conditions. Under adequate soil water supply photosynthesis was negatively linearly related to leaf water content, and positively linearly related to leaf nitrogen content and leaf color values, but negatively linearly related to leaf water content, nitrogen content and leaf color values under soil water stress. In addition, the ratios or differences of water content, nitrogen content & photosynthesis in different position leaves were significantly related to the leaf water content, N content and photosynthesis in canopy respectively.

**Key words** [Rice](#); [Leaf position](#); [Leaf water content](#); [Leaf color](#); [Leaf nitrogen content](#); [Leaf photosynthesis](#)

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