

Physiological Basis of Photosynthetic Function and Senescence of Rice Leaves as Regulated by Controlled-Release Nitrogen Fertilizer [PDF]

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摘要: The physiological mechanism of photosynthetic function and senescence of rice leaves was studied by using early rice variety Baliangyou 100 and late rice variety Weiyou 46, treated with controlled-release nitrogen fertilizer (CRNF), urea and no nitrogen fertilizer. CRNF showed obvious effects on delaying the senescence and prolonging photosynthetic function duration of rice leaves. Compared with urea, CRNF could significantly increase the chlorophyll content of functional leaves in both early and late rice varieties, and this difference between the treatments became larger as rice growth progressed; CRNF increased the activities of active oxygen scavenging enzymes super oxide dismutase (SOD) and peroxidase (POD), and decreased the accumulation amount of malondialdehyde (MDA) in functional leaves during leaf aging; Photosynthetic rate of functional leaves in CRNF treatment was significantly higher than that in urea treatment. The result also indicated that CRNF could effectively regulate the contents of indole-3-acetic acid (IAA) and abscisic acid (ABA) in functional leaves; IAA content was higher and ABA content was lower in CRNF treatment than those in urea treatment. Therefore, application of CRNF could increase the rice yield significantly due to these physiological changes in the functional leaves.

关键词: controlled-release nitrogen fertilizer; rice; photosynthetic function; senescence; physiological mec
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