

## 施氮和肥料添加剂对水稻产量、氮素吸收转运及利用的影响

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Effects of applying nitrogen fertilizer and fertilizer additive on rice yield and rice plant nitrogen uptake, translocation, and utilization.

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**摘要** 在苏南太湖地区开展田间试验,研究了施氮和肥料添加剂对水稻产量、氮素吸收转运及利用的影响.结果表明:施氮对水稻产量、各生育时期植株累积吸氮量、阶段氮累积量和花后氮素转运量具有显著的促进作用( $P<0.01$ ),当施氮量高于 $200\text{ kg}\cdot\text{hm}^{-2}$ 时,增施氮肥的增产效应不显著( $P>0.05$ );花后氮素转运率和氮肥利用率均随施氮量的增加而降低.施用肥料添加剂可进一步提高水稻产量、累积吸氮量、花后氮素转运量和氮肥利用率,且该效应在高施氮量( $\geq 200\text{ kg}\cdot\text{hm}^{-2}$ )条件下表现更明显.本试验条件下不施用肥料添加剂时,施氮 $150\text{ kg}\cdot\text{hm}^{-2}$ 可同时获得较高的产量和氮肥利用率.

**关键词:** 水稻 施氮量 肥料添加剂 产量 累积吸氮量 氮素转运 氮肥利用率

**Abstract:** A field experiment was conducted in the Taihu Lake region of southern Jiangsu to study the effects of applying nitrogen (N) fertilizer and fertilizer additive on the rice yield and the rice plant N uptake, translocation, and utilization. Applying N fertilizer had significant positive effects on the rice yield, accumulative absorbed N at all growth stages and at each growth stage, and N translocation rate after anthesis ( $P<0.01$ ). However, when the N application rate exceeded  $200\text{ kg}\cdot\text{hm}^{-2}$ , its yield-increasing effect was not significant ( $P>0.05$ ). The N translocation rate after anthesis and the N fertilizer use efficiency decreased with increasing N application rate. Applying fertilizer additive further improved the rice yield, accumulative absorbed N, N translocation rate after anthesis, and N fertilizer use efficiency, and this effect was more evident when the N application rate was equal to or greater than  $200\text{ kg}\cdot\text{hm}^{-2}$ . Relatively high rice yield and N use efficiency were achieved when applying  $150\text{ kg}\cdot\text{hm}^{-2}$  of N fertilizer without the application of fertilizer additive.

**Key words:** rice nitrogen application rate fertilizer additive yield accumulative absorbed nitrogen nitrogen translocation nitrogen fertilizer use efficiency

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