作物学报 2006 32 (10): 1491-1497 ISSN: 0496-3490 CN: 11-1809/S

研究论文

氮肥运筹对杂交稻主要品质性状及淀粉RVA谱特征的影响

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收稿日期 2005-11-28 修回日期 网络版发布日期 2006-9-14 接受日期 2006-3-8

摘要 以杂籼K优818和杂粳常优1号为材料，研究了在高产施氮量条件下（225 kg/hm^2），前、中期不同施氮比例及中期依不同叶龄期追氮对主要米质性状及淀粉RVA谱特征的影响。结果表明，随着施氮比例的前增中减，两品种稻米整精米率、蛋白质含量、消减值、垩白率、垩白度、糊化温度逐渐下降；胶稠度、淀粉峰值黏度、崩解值呈直线上升趋势；而热浆黏度、最终黏度对氮肥运筹的反应因品种而异。说明适当减少中期施氮比例可改善稻米外观、蒸煮品质并提高淀粉黏性，但同时也对稻米加工、营养品质带来不利的影响；中期不同叶龄期追氮因前期施氮比例的差异和品种的不同，效应也不尽一致，总体而言，随中期施氮比例的减少，相应推迟追肥叶龄期可以获得较好的稻米外观品质、蒸煮品质和淀粉黏性。对于胶稠度、淀粉峰值黏度、热浆黏度、最终黏度、崩解值、垩白率、垩白度、消减值等品质指标，常优1号较K优818推迟一个叶龄期施肥最佳。

关键词 杂交稻 氮肥 稻米品质 RVA

分类号 S511

Effect of Nitrogen Application on Main Quality and RVA Profile Characters of Hybrid Rice

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Abstract Rice quality can be improved through nitrogen fertilizer strategy, such as the rate and the timing of application. The establishment of “the leaf age model of development process of rice” makes rice cultivation move accurate in growth and development process modeling, cultivation diagnosis standardization and regularization of technical measures. The objective of this study was to find the suitable way of nitrogen application for improving the rice quality under the condition of the high yield. Using hybrids Kyou818 and Changyou1 planted with a total applied nitrogen amount of 225 kg/ha in the all growth stage. The different proportion of N-fertilizer at earlier and middle stages (the ratio of basic-tilling and stem- panicle fertilizer was 3:7, 5:5 and 7:3, respectively) and N-applying leaf age of stem- panicle N-fertilizers (Stage of remaining leaf primordium number 5, 3; 5, 4, 3, 2, 1; 4, 2; 3, 1, respectively) were imposed on the experiment. The results showed that with the increasing of N-application rate at earlier stages, head milled rice, protein content, setback, chalkiness and pasting temperature were decreased; gel consistency, peak viscosity and breakdown increased gradually; effect of N-fertilizer on trough viscosity and final viscosity varied with different cultivars. It suggested that the decrease of the nitrogen application proportion at middle stage improved facial features、cooking quality and viscosity of amylum, but adverse effect on milling quality and nutrient quality were found. Effect of N-applying leaf age on quality varied in different application proportions and cultivars. With decreasing proportion of N-application at middle stages, good facial features, cooking quality and viscosity of amylum were obtained by postponing the time of N-applying leaf age. Some quality indexes of Changyou 1 reached maximum (such as gel consistency, peak viscosity, trough viscosity, final viscosity and breakdown etc.) or minimum (such as chalkiness percentage, chalkiness degree and setback etc.) when the time of panicle fertilizer application was at a leafage later than that of K-you 818. This maybe attributes to Changyou 1 with long days-to-maturity. As a whole, the N-application proportion of 7:3 at earlier and middle stages could result in a good performance for quality of the two cultivars, while under this proportion, a much more good performance for quality of K-you 818 and Changyou 1 could be observed when applied stem- panicle N-fertilizers with equal amount in 4th and 2nd, and 3rd and 1st leaf age from top, respectively.

Key words Hybrid rice Nitrogen application Quality RVA

DOI:

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