锘
作物学报 2009, 35(10) 1866-1874 DOI: 10.3724/SP.J.1006.2009.01866 ISSN: 0496-3490 CN: 11-1809/S

论文

不同种植方式下氮素营养对陆稻中旱3号和水稻扬粳9538米质的影响

张亚洁，陈莹莹，闫国军，杜斌，周彧然，杨建昌*

扬州大学/江苏省作物遗传生理重点实验室，江苏扬州225009

摘要：

以粳型陆稻中旱3号和粳型水稻扬粳9538为材料，设置裸地旱种和水种两种方式及低氮(100 kg hm^{-2})、常氮(200 kg hm^{-2})和高氮(300 kg hm^{-2}) 3种氮素水平，比较了陆稻和水稻米质的差异。结果表明，旱种高氮处理下陆稻和水稻的产量以及水种高氮处理下水稻的产量较常氮有所下降，但水种高氮处理下陆稻的产量较常氮增加；增加施氮量使陆稻的垩白粒率和垩白度均先增加后下降，两品种稻米的直链淀粉含量下降，蛋白质含量增加，而水稻在旱种方式下垩白粒率和垩白度下降，在水种方式下增加。陆稻以常氮处理及水稻以低氮处理的崩解值最高，消减值最小。旱种使陆稻外观和营养品质有所改善；陆稻和水稻旱种的其他品质指标与水种无显著差异。与水稻相比，陆稻的营养品质较优，外观和蒸煮品质稍差，其蒸煮和营养品质指标与叶片含氮率的相关程度较低。表明陆稻和水稻的米质对种植方式和氮素的响应有明显差异。对陆稻和水稻的高产优质栽培途径进行了讨论。

关键词： 陆稻 水稻 旱种 氮素 米质

Effects of Nitrogen Nutrition on Grain Quality in Upland Rice Zhonghan 3 and Paddy Rice Yangjing 9538 under Different Cultivation Methods

Key Laboratory of Crop Genetics and Physiology, Jiangsu Province / Yangzhou University, Yangzhou 225009, China

Key Laboratory of Crop Genetics and Physiology, Jiangsu Province / Yangzhou University, Yangzhou 225009, China

Abstract:

Upland rice and dry-cultivated paddy rice have been attracted more and more attention because of limited water resources in China. Researches on interaction between water and nitrogen supplies for crop resistance to drought stress has become a hot topic in crop physiology. However, the information linking to the effect of nitrogen nutrition on grain quality of upland rice and paddy rice under different cultivation methods is unavailable. The objective of this study was to evaluate the difference between upland rice and paddy rice and interaction between cultivation methods and N levels. One upland rice cultivar Zhonghan 3 (*japonica*) and one paddy rice cultivar Yangjing 9538 (*japonica*) were grown under either moist cultivation (MC, control) or bare dry-cultivation (DC) conditions, with three N levels, low amount of nitrogen (LN, 100 kg ha^{-1}), normal amount of nitrogen (NN, 100 kg ha^{-1}), and high amount of nitrogen (HN, 300 kg ha^{-1}). The results showed that, compared with NN, the grain yield under HN was lower for both upland and paddy rice under DC and for paddy rice under MC, whereas it was higher for upland rice under MC. Under both DC and MC，the percentage of chalky grains and the chalkiness of upland rice were increased under NN and reduced under HN. With the increase in N levels, amylose content was reduced and protein content was increased for both upland and paddy rice. However, the percentage of chalky grains and the chalkiness of paddy rice was decreased under DC and increased under MC. Breakdown viscosity was the highest and setback viscosity was the lowest for upland rice under NN and for paddy rice under LN. The bare dry cultivation can improve appearance quality and nutrient quality for upland rice. There was no significant difference in other rice quality indices between upland rice and paddy rice under DC. Compared with paddy rice, upland rice showed better nutrient quality and poor appearance quality and cooking quality. The correlation coefficient between cooking and nutrient quality and leaf nitrogen content was smaller for upland rice than for paddy rice. The results suggest that the response to cultivation methods and nitrogen levels varies largely between upland rice and paddy rice. The approaches to increase grain yield and grain quality for both paddy and upland rice were discussed.

Keywords: Upland rice Paddy rice Dry Cultivation Nitrogen Rice quality

收稿日期 2009-01-05 修回日期 2009-04-15 网络版发布日期 2009-08-07

DOI: 10.3724/SP.J.1006.2009.01866

基金项目:

本研究由国家自然科学基金项目（30671225，30771274），江苏省自然科学基金项目（BK2006069），扬州大学高层次人才科研启动基金项目资助。

通讯作者: 杨建昌，Tel:0514-87979317; E-mail:jcyang @yzu.edu.cn

作者简介:

参考文献：

本刊中的类似文章

1．徐孟亮;陈良碧.4个水稻高产品种与巴西陆稻的耐旱性比较研究[J]. 作物学报, 2003,29(06): 903-907

2．张亚洁;周彧然;杜斌;杨建昌.不同种植方式下氮素营养对陆稻和水稻产量的影响[J]. 作物学报, 2008,34(06): 1005-1013

3．张亚洁;杨建昌;杜斌.种植方式对陆稻和水稻磷素吸收利用的影响[J]. 作物学报, 2008,34(01): 126-132

4．张亚洁;周彧然;孙斌;刁广华;林强森;杨建昌.种植方式对陆稻中旱3号和水稻武香粳99-8米质的影响[J]. 作物学报, 2007,33(01): 31-37

文章评论 (请注意:本站实行文责自负, 请不要发表与学术无关的内容!评论内容不代表本站观点.)

HTTP Status 404 - /zwxb/CN/comment/listCommentInfo.jsp

type Status report