

研究论文

分子标记辅助选择的修饰回交聚合育种方法及其在棉花上的应用

郭旺珍, 张天真, 朱协飞, 潘家驹

南京农业大学棉花研究所, 作物遗传与种质创新国家重点实验室, 江苏南京210095

收稿日期 2004-9-7 修回日期 2005-1-16 网络版发布日期 接受日期

摘要 修饰回交育种法是将杂种品系间杂交和回交方法结合起来, 用于棉花多个优良性状聚合的育种改良方法。随着分子标记技术日益完善地用于育种的选择中, 我们提出了分子标记辅助选择的修饰回交聚合育种方法。它以生产上推广或即将推广的品种为轮回亲本, 将修饰回交育种法和分子标记辅助选择育种相结合, 同时对轮回亲本的遗传背景和具有育种目标性状的基因或QTL进行选择, 从而可显著提高育种效率。利用这一方法, 我们以长江流域推广品种泗棉3号为轮回亲本, 山西94-24和7235品系分别为抗虫基因和优质QTL的供体亲本, 进行分子标记辅助的优质QTL系统选择和外源Bt基因的表型及分子选择。在(泗棉3号×7235)BC1F4中获得遗传背景与泗棉3号相近, 株型稳定, 且具有优质QTL的高强株系, 在(泗棉3号×转Bt品系94-24)BC4F1中获得遗传背景与泗棉3号相近, 抗棉铃虫效果明显的单株。进一步通过高世代优质和抗虫目标株系的互交, 分子标记辅助目标性状选择, 目标基因纯合及稳定性检测, 使高强纤维QTL和Bt基因快速聚合, 培育出了优质、高产的抗虫棉新品系南农85188。

关键词 [棉花](#) [纤维强度](#) [抗虫性](#) [修饰回交育种群体](#) [QTL](#) [MAS](#)

分类号 [S562](#)

Modified Backcross Pyramiding Breeding with Molecular Marker-Assisted Selection and Its Applications in Cotton

GUO Wang-Zhen, ZHANG Tian-Zhen, ZHU Xie-Fei, PAN Jia-Ju

National Key Laboratory of Crop Genetics & Germplasm Enhancement, Cotton Research Institute, Nanjing Agricultural University, Nanjing 210095, Jiangsu, China

Abstract Using upland cotton (*G. hirsutum* L.) as research material, our objective was to describe and implement a modified backcrossing approach for introgressing transgenes or Quantitative trait loci (QTLs) into target genetic backgrounds. Modified backcrossing is an improved breeding procedure combining inter-strain crossing and backcrossing methods to pyramid many traits. In the wake of availability of molecular marker technology for application to plant breeding, we propose a new backcrossing method called modified backcross pyramiding breeding (MBPB) combined with molecular marker-assisted selection (MAS). With MBPB, MAS was used in modified backcrossing and selection, i.e., target genes or QTLs and the recurrent parental background was simultaneously selected by molecular markers. Henceforth, the breeding efficiency was significantly improved. By using this procedure, QTLs for stronger fiber strength and transgene cryIA have been rapidly pyramided in new cultivar NAU 85188 with Simian 3 background in cotton. The new cotton cultivar is characterized by elite fiber qualities, insect-resistance and high yield potential. The described breeding procedure can be used to simultaneously pyramid transgenes or QTLs in modern breeding programs.

Key words [Upland cotton](#) [Fiber strength](#) [Insect-resistance](#) [MBPB population](#) [QTL](#) [MAS](#)

DOI:

通讯作者 张天真 cotton@njau.edu.cn

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(548KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“棉花”的 相关文章](#)

▶ 本文作者相关文章

- [郭旺珍](#)
- [张天真](#)
- [朱协飞](#)
- [潘家驹](#)