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### 扬麦13抗赤霉病品系的分子标记辅助选育

### Breeding the Lines with Resistance to Fusarium Head Blight of Wheat Cultivar Yangmai 13 by Molecular Marker Assisted Selection

DOI:

中文关键词: 小麦 赤霉病 标记辅助选择 抗性育种

英文关键词: Wheat Fusarium head blight Marker assisted selection Resistance breeding

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中文摘要:

通过分子标记辅助选择技术和回交育种方法,以苏麦3号为抗赤霉病基因*Fhb1*和*Fhb2*的供体亲本,以弱筋感病品种扬麦13为受体和轮回亲本,对扬麦13进行赤霉病抗性改良。利用抗性基因紧密连锁的SSR标记筛选和田间赤霉病抗性鉴定,获得8个农艺性状似轮回亲本且含有目标基因的品系。通过分子标记对其进行遗传背景分析,获得3个与轮回亲本基本相同的品系。对这3个品系和扬麦13进行赤霉病接种鉴定和主要品质指标检测与比较,最终培育出携带赤霉病抗性基因且保持轮回亲本优良农艺性状及弱筋品质的品系R扬麦13 2、R扬麦13 7和R扬麦13 8,赤霉病病小穗率降低了78.82%~84.58%,产量提高了17.24%~26.72%,完全可以替代当前生产上高感赤霉病的扬麦13品种进行推广应用。这表明利用与抗性基因紧密连锁的分子标记辅助育种是一种有效的途径,可以实现小麦赤霉病抗性改良的目标。

英文摘要:

Molecular marker assisted method combined with backcrossing was used to improve the disease resistance of Yangmai 13 to *Fusarium* head blight (FHB) and increase its production and profits. Using the resistant cultivar Sumai 3 as the donor parent of FHB resistance gene *Fhb1* and *Fhb2*, and Yangmai 13 serve as the receptor and the recurrent parent, which was planted largest in the middle and lower reaches of the Yangtze River with weak gluten character and poor resistance to FHB, we successfully characterized eight lines with agronomic traits resemble to Yangmai 13 by using SSR markers linked to resistance genes. Finally, three lines with genetic background consistency with the recurrent parent were identified by genetic molecular markers, which were used for further tests of pathogen inoculation and main quality traits. The three lines developed through this method, were named as R Yangmai 13 2, R Yangmai 13 7 and R Yangmai 13 8, carrying *Fhb1*, *Fhb2*, good agronomic traits and soft quality. The disease incidence of them decreased by 78.82%~84.58% and wheat yield improved by 17.24%~26.72%, respectively compared to Yangmai 13, and could replace the susceptible FHB Yangmai 13 for large plantation. This study demonstrates that molecular marker assisted selection with molecular markers tightly link to the major resistance genes offers opportunities for transferring FHB resistance in wheat breeding.

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