

农学—研究报告

高品质棉与抗虫棉杂交株型性状的遗传及与产量性状的关系

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摘要:

采用增广NC II 设计,以5个高品质陆地棉品种(系)为母本,5个转基因抗虫棉品种(系)为父本组配的25个杂交组合为材料,研究主要株型性状的遗传效应、杂种优势及与产量性状的相关性。结果表明,株高、始果枝高、果枝数和果节数的平均中亲优势较小,但不同组合间差异较大,均符合加性遗传模型。遗传相关分析表明,株高与株铃数、单株皮棉重呈极显著正相关;果枝数与株铃数呈极显著正相关,与铃重呈极显著负相关;果节数与株铃数、衣分和单株皮棉重呈显著正相关。株型性状与产量性状间的关联性主要是由果节数与株铃数、铃重的相关引起。研究结果为高品质抗虫棉理想株型性状的选育与调控具有一定的指导意义。

关键词: 高品质陆地棉; 转Bt基因抗虫棉; 株型性状; 产量性状; 遗传分析

Genetic Analysis of Plant Type Traits and the Relationships between Plant Type Traits and Yield Traits of hybrids of Bt Transgenic Cotton×High Quality Upland Cotton

Abstract:

Optimal plant architecture contribute to the increase of photosynthesis efficiency and cotton yield. Little information is available about the inheritance and heterosis of plant architecture characters in upland cotton. The objective of this study were to evaluate the genetic effects and heterosis of plant architecture characters in a population made by crossing five Bacillus thuringiensis(Bt) transgenic cotton varieties as males and five nontransgenic lines with high fiber strength as females, and analyze the interrelationships between plant architecture characters and yield and yield components. The results showed the mean mid-parent heterosis of plant height, height of the first fruiting branch, fruiting branch number and fruiting node number were rather low, but expressed large variations among diverse cotton crosses. The four plant architecture characters exhibited primarily additive genetic effects. The genetic correlations between plant height and bolls per plant, single plant lint yield were found positive and significant at 0.01 level. Fruit branch number was positively related with bolls per plant, but was negatively correlated with boll weight. There were significant positive relationships between fruit node number and bolls per plant, lint percentage, single plant lint yield. The relationship between plant architecture traits and yield traits was mainly due to the correlation between fruit node number and bolls per plant, boll weight.

Keywords: high quality upland cotton Bt transgenic cotton plant type traits yield traits genetic analysis

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