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腐胺引发对2个转基因抗虫杂交棉耐盐性的影响

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Effect of Putrescine Priming on the NaCl Tolerance of Two Transgenic Insect Resistant Hybrid Cotton (*Gossypium hirsutum* L.)

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摘要

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摘要 以转基因抗虫杂交种慈抗杂3号和浙杂14为材料, 研究了棉花种子不同浓度腐胺引发对于转基因抗虫杂交种在0.5%盐胁迫条件下的发芽、出苗、产量和纤维品质的影响。研究结果, 腐胺引发处理可以显著地提高转基因抗虫杂交棉种子在盐胁迫条件下的发芽率、发芽指数和田间出苗率, 显著降低平均发芽时间。在含有0.5%盐的沿海滩涂地上, 腐胺引发处理后的单株铃数、铃重和衣分无显著差异, 但最后的皮棉产量却有显著增加, 并可提高纤维的马克隆值和比强度。腐胺处理对非盐胁迫条件下的幼苗体内的SOD活力、POD活力和MDA含量无显著影响, 但在盐胁迫条件下可显著或极显著地提高转基因抗虫杂交棉幼苗的体内的SOD与POD活力, 显著减少MDA的积累。

关键词: 棉花 腐胺 引发 盐胁迫 发芽

Abstract: The effect of seed priming with putrescine on the seed germination, seedling emergence, yield, and fiber quality of the transgenic insect resistant hybrid cottons stressed by 0.5% NaCl was studied, using two extending transgenic insect resistant hybrid cotton cultivars, ZKZ-3 and ZZ-14, as the materials and extending normal cotton cultivar. The results indicated that seed priming treatment with putrescine could improve the germination percentage, germination index, mean germination time, and seedling emergence of the two transgenic hybrid cotton cultivars stressed with 0.5% NaCl significantly. On the shoal land with 0.5% NaCl, there were no significant effects of seed primer with 0.05 mmol·L⁻¹ putrescine on the bolls per plant, boll weight, and lint percent, but lint yield which was increased by seed primer with putrescine significantly. Also, there was no significant effect of seed primer with putrescine on the staple length, but on micronaire and fiber strength. The results of analysis for SOD, POD, and MDA in the different organs of seedlings showed that putrescine primer could increase the activities of POD and SOD in the cotton seedling plant stressed with 0.5% NaCl significantly, but decrease dramatically for the content of MDA, comparing with the checks without priming or primer with water.

Keywords: cotton priming putrescine salt stress seed germination

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