



温湿度处理对Bt棉杀虫蛋白表达的影响

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Effect of Combination Stress of Temperature and Humidity on Insecticidal Protein Expression of Bt Transgenic Cotton

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摘要

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摘要 以转Bt基因抗虫棉杂交种泗杂3号为试验材料, 在人工气候室内设置4种温度和湿度组合(高温高湿度、高温低湿度、低温高湿度、低温低湿度), 研究了不同生育期温湿度胁迫及胁迫解除后Bt棉杀虫蛋白表达量的变化。结果表明, 温湿度胁迫显著抑制Bt棉杀虫蛋白的表达。同一生育期, 高温高湿度下Bt蛋白含量降幅最小, 胁迫解除后恢复能力最强; 低温低湿度下Bt蛋白含量降幅最大, 恢复能力最弱。不同时期温湿度胁迫下Bt蛋白含量降低幅度表现为盛铃期>盛花期>盛蕾期, 胁迫解除后Bt蛋白的恢复水平表现出相反的趋势。温湿度胁迫及胁迫解除后Bt蛋白表达量的恢复与胁迫类型、棉花生育期密切相关。

关键词: 杀虫蛋白 温湿度胁迫 Bt棉

Abstract: Using insect-resistant transgenic cotton Sikang 3 as material, four combined stress was designed to study the effect of combination stress of temperature and humidity and its recovery on insecticidal protein expression of Bt transgenic cotton which was high temperature-humidity, low temperature-humidity, high temperature with low humidity and low temperature with high humidity. The results showed that combined stress decreased insecticidal protein content. Under the same growth period, the decrease amplitude of Bt content was lowest with high temperature-humidity stress, while highest with low temperature-humidity stress. However, the recovery level of Bt content after released from combined stress was highest with high temperature-humidity stress, while lowest with low temperature-humidity stress. Under the same stress, the decrease amplitude of Bt content was low at peak square period, middle at peak flowering period, high at peak boll period under four combined stress, however, the recovery level of Bt content after stress stopped performed reverse trend. These results suggested that the decrease amplitude of Bt content under combination stress of temperature and humidity stress and recovery level of Bt content after stress stopped was closely associated with stress types and cotton development stages.

Keywords: Bt protein combination stress of temperature and humidity Bt cotton

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