



彩色棉主茎功能叶片生理特性比较研究

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Comparative Studies on Physiological Characteristics of Main Stem Functional Leaves of Colored Cotton Varieties

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摘要 以棕色棉皖棉38号、绿色棉皖棉39号和白色棉皖棉25号为材料,研究了2个彩色棉品种主茎功能叶片主要生理特性的差异。结果表明,彩色棉主茎功能叶片的叶绿素、可溶性蛋白质及可溶性糖含量全生育期变化趋势与白色棉一致,均在盛花期达到极大值,但全生育期3个指标净值均低于白色棉,且在盛花期以后迅速降低;彩色棉品种超氧化物歧化酶(SOD)、过氧化物酶(POD)、过氧化氢酶(CAT)活性在整个生育期变化较为相似,SOD、POD活性在盛花期达到高峰后下降。与棕色棉相比,绿色棉的SOD、POD、CAT的活性除初花期较高外,其余3个时期均低于棕色棉;初花期棕色棉的MDA含量较高,吐絮期绿色棉较高。由此可知,绿色棉在受到逆境伤害的时候,功能叶片会提高保护酶的活性,降低逆境对棉株的损伤。吐絮期绿色棉保护酶活性下降较快,出现早衰现象。

关键词: 绿色棉 棕色棉 主茎叶 生理特性

Abstract: Use varieties of Wanmian 38(brown-fiber cotton), Wanmian 39(green-fiber cotton), and the parental material Wanmian 25 (white-cotton) to analyze the difference between the brown-fiber cotton and the green-fiber cotton in physiological characteristics of main stem functional leaves within two cotton varieties. The results showed that the contents of chlorophyll, soluble protein and soluble sugar in white cotton were the same as colored ones. The dynamics tend to peak at the full flowering stage. The three indices of colored cotton varieties were lower than the white cotton's at the whole stage, and rapidly decreased after the full flowering stage. The activities of SOD, POD and CAT within the two colored cotton varieties were quite similar at the whole development stage, with the activities of SOD, POD peaking at the full flowering stage and decreasing after the opening of bolls. Compared with brown-fiber cotton, the activities of SOD, POD, CAT of green-fiber cotton were much higher at the primary flowing stage, but much lower at the rest three periods. Specifically, MDA content in brown-fiber cotton was higher than those of green-fiber cotton and white cotton in initial stage of bloom. While in the boll opening stage, the MDA content of green-fiber cotton was higher. So that, when the green-fiber cotton was damaged under stress, activities of protective enzymes will be increased by functional leaves in order to minimize the damage to the cotton plant. While at the boll stage, activities of cell defense enzymes of green-fiber cotton decreased fast and resulted in senescence of cotton.

Keywords: green-fiber cotton brown-fiber cotton stem leaves physiological characteristics

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