



BIOCHEMICAL VARIATIONS AND PRODUCTIVITY IN Bt AND NON-Bt COTTON GENOTYPES

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Abstract

The field experiment was laid out in a randomized block design with three replications on vertisol at the Main Agricultural Research Station (MARS), University of Agricultural Sciences, Dharwad during the rainy seasons of 2007 and 2008 to assess the productivity and compare the biochemical variations in Bt vis-a-vis non-Bt cotton genotypes. The experiment consisted of ten cotton genotypes [Bt and corresponding non Bt (BG-I) of Bunny RCH-368, JK Durga, (BG-II) Neeraja and non-Bt hybrid DCH-32 and variety Sahana]. Sowing was done by adopting 90 × 60 cm spacing. The research results indicated that Neeraja (BG-II) Bt produced significantly higher seed cotton yield (2483 kg/ha) compared to other genotypes. The lowest seed cotton yield was recorded in RCH-368 non-Bt (1131 kg/ha). Biochemical variations revealed that Neeraja non-Bt recorded significantly higher total chlorophyll content (1.66 mg/g fresh weight) compared to other genotypes. The lowest total chlorophyll content (1.04 mg/g fresh weight) was recorded with Sahana non-Bt variety. The chlorophyll fractions (chlorophyll 'a' and 'b') followed the similar trend. At 120 days after sowing, check Sahana non-Bt variety recorded significantly higher RLI (2.29) and it was on par with RCH 368 (BG-I) Bt (1.97) and JK Durga (BG-I) Bt (1.92). Between Bt and non-Bt genotypes, Bt genotypes recorded significantly higher RLI (1.82) compared to non-Bt genotypes (1.63). Among Bt genotypes, Neeraja (BG-II) Bt recorded significantly lower RLI (1.58) than others.

Key words : Bt cotton, Leaf reddening, Red leaf index (RLI), Bollgard-I (BG-I), Bollgard-II (BG-II).

1. Introduction

In India, cotton was cultivated in an area of 11.16 m ha with a production of 31.20 million bales of seed cotton during 2010-11. Average productivity of cotton in India is 494 kg lint/ha, which is low when compared to world average of 725 kg lint/ha [Anon (2011)]. Maharashtra, Gujarat, Andhra Pradesh, Madhya Pradesh, Punjab, Haryana, Karnataka, Rajasthan and Tamil Nadu are the important cotton growing States in India. In Karnataka, the present cotton growing situation is showing improvement after release of Bt cotton and is grown on an area of 3.95 lakh hectare with a total production of 9.0 lakh bales of seed cotton with a productivity of 387 kg lint/ha. The increase in productivity from 229 kg lint/ha in 1996 to 387