

# Variations in biochemical and yield parameters of Bt and non-Bt cotton genotypes

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## Abstract:

The field experiment was laid out in a randomized complete block design replicated thrice on vertisol at Main Agricultural Research Station (MARS), University of Agricultural Sciences (UAS), Dharwad during the rain fed seasons of 2007 and 2008 to study the biochemical variations in Bt and corresponding non-Bt cotton genotypes. The experiment consisted of eight treatments viz., T<sub>1</sub>-Bunny (BG I) Bt, T<sub>2</sub>-Bunny non-Bt, T<sub>3</sub>-RCH-368 (BG I) Bt, T<sub>4</sub>-RCH-368 non-Bt, T<sub>5</sub>-JK Durga (BG I) Bt, T<sub>6</sub>-JK Durga non-Bt, T<sub>7</sub>-Neeraja (BG II) Bt and T<sub>8</sub>-Neeraja non-Bt were sown at 90 x 60 cm spacing. The results indicated that among the different genotypes studied, Neeraja (BG II) Bt produced significantly higher seed cotton yield (2483 kg/ha) compared to other genotypes. The yield of tested cotton genotypes was in the range of 2483 kg/ha to 1131 kg/ha. The lowest yield was observed in RCH-368 non-Bt (1131 kg/ha). Biochemical variations revealed that among the cotton genotypes, Neeraja non-Bt recorded significantly higher total chlorophyll content (1.66 mg/g fresh weight) compared to other genotypes. The lowest total chlorophyll content (1.17 mg/g fresh weight) was recorded with RCH 368 (BG I) Bt. The chlorophyll fractions, both chlorophyll 'a' and 'b' followed the similar trend. Between Bt and non-Bt genotypes, significantly higher anthocyanin content (0.237 mg/g fresh weight) was observed in Bt in comparison with non-Bt genotypes (0.156 mg/g fresh weight). The anthocyanin content increased by 34.2 per cent in Bt cotton genotypes compared to non-Bt cotton genotypes. Red leaf index (RLI) at 90 DAS was 1.25 and increased to 1.72 at 120 DAS among the genotypes. At 120 DAS, RCH 368(BG-I) Bt recorded significantly higher RLI (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.

**Keywords:** Bt cotton, Leaf reddening, Red leaf index, Bollgard I, Bollgard II

## 1. Introduction:

In India, Bt cotton since its release in 2002 by Genetic Engineering Approval Committee (GEAC) replaced more and more conventional cotton area. There was an exponential increase in Bt cotton area from 29,000 hectares in 2002 to 11.16 m ha in 2010 accounting for a staggering 92% of the total cotton area in India. It is estimated that Bt cotton would cover an area of 15.0 m ha by 2015 (Manjunath, 2011). The production