INTERNATIONAL JOURNAL OF FORESTRY AND CROP IMPROVEMENT (December, 2010); 1 (2): 55-59

#### **RESEARCH ARTICLE**

Received : Aug., 2010; Accepted : Sept., 2010



# Physiological basis for growth and yield variation in Bt and non Bt cotton hybrids

### K.N. PAWAR, B.C. PATIL AND PRAKASH KOLER

#### ABSTRACT

A field experiment was conducted under rainfed condition at Agriculture Research Station, Dharwad to compare the morpho physiological characters and yield potential of different Bt and non-Bt cotton hybrids. The experiment consisted of four Bt hybrids and their non Bt counter parts and one check hybrid laid out in a split plot design with two dates of sowing as a main plot and nine genotypes as subpots with three replication. There was no significant difference between the dates of sowing for many of the growth and yield. Among the Bt hybrids NHH-44 Bt produced significantly higher seed cotton yield (2256 kg ha<sup>-1</sup>) and among non-Bt hybrids MRC-6322 non-Bt (1641 kg ha<sup>-1</sup>). This was mainly attributed to its close association with number of bolls per plant and boll weight per plant. While Bt hybrids recorded less plant height, less LAI than non-Bt hybrids. Genotypes differed significantly in their growth pattern, morphological characters and phonological characters. Among the genotypes, non-Bt hybrids recorded more plant height, number of leaves and leaf area index compared to Bt cotton hybrids indicating their more vegetative growth. Bt hybrids matured five to eight days early compared to non-Bt hybrids. Bt hybrids recorded less boll damage than non-Bt hybrids.

#### KEY WORDS : Cotton, Bt, Non Bt , Date of sowing

Pawar, K.N., Patil, B.C. and Koler, Prakash (2010). Physiological basis for growth and yield variation in Bt and non Bt cotton hybrids, *Internat. J. Forestry and Crop Improv.*, 1(2): 55-59.

## INTRODUCTION

Cotton is an important cash crop cultivated over an area of 34.2 m. ha in the country out of which 18 per cent area is under Bt cotton (Anonymous, 2006). India ranks first in the world cotton area and fourth in production of cotton. The productivity of cotton in the country is low (502 kg/ha) compared to other cotton growing countries. Moreover, cultivation of hybrids cotton has become a costly affair because of severe pest attack which has made it compulsory for indiscriminate use of pesticides and chemical fertilizers and thus polluting the entire agro ecosystem. The control of boll worms in cotton has become a psycho-socioeconomic tension of farmers and hence, there is a need to develop bollworm resistant varieties of hybrids.

The transgenic cotton containing cry genes responsible for crystalline, endotoxin of production in soil bacterium, *Bacillus theringenss*. var *kusrtaki* Berliner

Correspondence to:

Authors' affiliations:

were transferred to cotton via. *Agrobacterium* with Ca MV 35S promoter (Umbeck *et al.*, 1987). Bt gene is harmful to the bollworm and the endotoxin produced by the bacteria has proved effective against lepidopteron insects. Bt cotton trials conducted at various places in India to know the yield potentiality of Bt as compared to non Bt hybrids have shown encouraging results and will be highly beneficial to the farmers (Khadi *et al.*, 2002). Studies on morpho-physiological character of Bt cotton are very less. Therefore, a study was under taken to evaluate the growth, phenology and yield of different Bt and non Bt cotton hybrids at two dates of sowing.

## **MATERIALS AND METHODS**

The experiment was laid out in split plot design, replicated three times on the medium black soil at Agriculture Research Station, Dharwad Farm (altitude of 678m, latitude of 15° 26 N), Dharwad (Karnataka, India) during 2006-07 and 2007-08. The average annual rainfall of the location was 905.9 mm (2006-07) and 1086.7 mm (2007-08). Soil type was medium black with PH 8.0, EC. 0.33 dS/m. the treatment consisted of two dates sowing (main plots) and genotypes (subplots comprising of four Bt and their non Bt counter parts and one local check DHH-543). After the harvest of the previous crop, the

**K.N. PAWAR,** University of Agricultural Sciences, Agricultural Research Station, DHARWAD (KARANATAKA) INDIA

**B.C. PATIL AND PRAKASH KOLER,** University of Agricultural Sciences, Agricultural Research Station, DHARWAD (KARANATAKA) INDIA