

Validation of Bt-gene and study of packaging materials on seed longevity in Bt-cotton hybrids

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A laboratory experiment was carried out to validate Bt gene and to study the storage potential of Bt-cotton hybrids. Results revealed that, all the six Bt-cotton hybrid seed lots selected for the study were positive for Bt-gene (*Cry I Ac*). In the storage study, the seed lot L_1 recorded highest germination (71.55%) and lowest in L_3 (68.11%) at the end of ten months of storage. Among the packaging materials, seeds stored in P_1 and P_2 recorded highest germination (71.50 and 71.50%, respectively) compared to P_3 (68.11 %). Seedling vigour index was highest (2007) in L_1 and lowest (1792) in L_6 . Irrespective of seed lots, P_1 recorded highest vigour (1981) followed by P_2 (1963) and lowest in P_3 (1759) at the end of ten months of storage. Germination per cent in polythene bag and polylined cloth was above the minimum seed certification standards (70.00%) upto ten months of storage. However, genotypic differences were observed with respect to seed quality.

Key words : Cotton, Validation, Bt gene, Storability, Seed quality

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INTRODUCTION

Cotton is a king of fibre crop belongs to family Malvaceae and the genus *Gossypium* which includes 20 wild as well as cultivated species. It is one of the most important fibre crops playing a key role in textile industry, economic and social affairs of the world. It is the oldest among the commercial crops of the world. Cotton is used as a fabric in India from time immemorial. Globally, China stands first in cotton production (32 million bales) followed by India (25.81 million bales). India has the world's largest acreage of 9.43 million hectares representing about one quarter of global area (35 million ha) under cotton cultivation. The average yield of cotton in India is 466 kg/ha, which is far below the world average of 677 kg/ha and in India the overall production accounts for 25.81 million bales (Anonymous, 2008). The main cause for reduced yield is due to bollworm attack and depending on rainfed cultivation. To overcome bollworm infestation Bt-cotton was developed by insertion of *Cry IAC* gene which confers resistance against bollworms.

Seed purity and germination are two important factors, which determine seed quality. The rapid loss of seed viability and vigour in storage leads to poor stand establishment of

the crop and low productivity. Hence, storage of seeds after harvest till next sowing season is of prime importance for better seed yields. Many a times the seed is to be stored for many years as buffer stock. The seed deterioration starts right at the field levels immediately after the physiological maturity. The seed has to be stored safely so that the viability and vigour is maintained intact, as cotton seeds deteriorates at faster rate being an important oilseed crop. Therefore, the present study was carried out to study the effect of packaging materials on longevity of cotton hybrids.

RESEARCH METHODOLOGY

The experiment was carried out in the Department of Seed Science and Technology, University of Agricultural Sciences, Bangalore during 2010-11. The Bt-cotton hybrid seed lots treated with imidacloprid @ 10g/kg and thiram 1g/kg of seeds were obtained from seed companies located at Rannebennur, Karnataka viz., L_1 : Jai-Bt (a), L_2 : Jai-Bt (b), L_3 : Bunny-Bt, L_4 : Cheeranjeevi-Bt (a), L_5 : Cheeranjeevi-Bt (b), L_6 : Mallika-Bt seeds were cleaned, graded, subjected for validation of Bt-gene, analyzed for initial seed quality parameters (Table 1) and stored different packaging materials viz., P_1 : Polythene