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Population of Coccinellids in Bt cotton

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ABSTRACT

Population of Coccinellids in transgenic Bt cotton and non Bt cotton *viz*., MECH 162 Bt, MECH 184 Bt, RCH2 Bt, and their non Bt (NBt) counterparts along with the check varieties MCU 7, SVPR3 were investigated in the two field experiments conducted during summer 2006 and winter 2006 at Karaikal district, U.T. of Puducherry. The mean population of Coccinellids was higher in check varieties MCU7 (9.48 and 10.37) and SVPR3 (9.98 and 11.36) compared to the Bt varieties MECH162 Bt (2.23 and 8.70), MECH 184 Bt (2.58 and 8.64) and RCH2 Bt (3.06 and 8.39per 10 plants) in summer and winter crop, respectively. It was found that the Bt hybrids recorded a low population of Coccinellids and the population in NBt hybrids is comparable with the check varieties MCU7 and SVPR3.

Key words : Bt cotton, NBt cotton, Coccinellids, Population.

Among the pests in cotton, bollworm complex (Coccinellids) is very serious throughout the country and pose a serious threat to cotton cultivation in many agro-ecological zones (Uthamasamy, 1994). To reduce the damage, more than 70 per cent of the insecticides are applied for the management of bollworms alone. Application of insecticides to manage the insect pests has resulted in the resurgence of sucking pest and resistance of the target insect pests. Besides, enormous production and use of insecticides has ecocidal effects. Development of an ecofriendly and potent method to reduce the incidence of this pest is highly imperative at this juncture (Bharathan, 2000; Sharma, 2001). To overcome these problems Bt gene was identified. Transgenic cotton engineered to continuously express delta endotoxin from the Bt gene, holds great promise for controlling bollworm complex (Gould, 1998). Host plant resistance provides sound platform for pest management and therefore it has been considered as an important component in any IPM modules. The transgenic cotton expressing delta endotoxin protein of Bt could reduce the impact of chemical insecticides and create ecologically sound breeding programmes without reducing crop production as a part of IPM strategy (Lutterell and Herzog, 1994.). In this, transgenic cotton cultivation may encourage the development new pest biotypes due to lack of natural enemies. The present study was undertaken to evaluate the transgenic cotton safety against the natural enemies.

MATERIALS AND METHODS

Population of Coccinellids in transgenic Bt cotton and non Bt cotton *viz*., MECH 162 Bt, MECH 184 Bt, RCH2 Bt, and their non Bt (NBt) counterparts along with the check varieties MCU 7 and SVPR3 were investigated in the two field experiments conducted during summer 2006 and winter 2006 at Pandit Jawaharlal Nehru College of Agriculture and Research Institute (PAJANCOA and RI), Karaikal, U.T. of Puducherry. The experiment was laid out in a Randomized Block Design (RBD) with three replications and eight treatments in 8x5 square metre plots. The treatments included MECH 162 Bt, MECH 162 NBt, MECH 184 Bt, MECH 184 NBt obtained from Maharashtra Hybrid Seed Company (MAHYCO), Jalna, India and RCH2 Bt and RCH2 NBt obtained from Rasi Seeds Pvt. Ltd., Tamil Nadu, India along with check varieties, MCU7 and SVPR3.The agronomic practices were carried out as per the crop production guide of TamilNadu Agricultural University, Coimbatore, India.

The population of Coccinellids was recorded and *in situ* counts were taken at weekly intervals in the middle two rows, leaving the border row plants. The total number of Coccinellids were counted and expressed as number per 10 plants. The observations recorded for natural enemies were transformed by using formula $\sqrt{X+0.5}$ and used for statistical analysis. The data obtained from field experiments were analysed in a Simple Randomised Block Design by 'F' test for significance as described by Panse and Sukhatme (1958). Critical difference values were calculated at 5 per cent probability level and the treatment mean values of the experiment were compared using Duncans Multiple Range Test (DMRT) (Gomez and Gomez, 1984).

RESULTS AND DISCUSSION

The Coccinellids, *Harmonia octomaculata* (Fab.), *Micraspis* sp., *Coccinella transversalis* (Fab.), *Menochilus sexmaculatus* (Fab.) in the Bt cotton at