

MANAGEMENT OF PINK BOLLWORM USING BEHAVIOR-MODIFYING CHEMICAL (SPLAT PHEROMONE) IN *Bt* COTTON

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ABSTRACT : Integrated pest management through mating disruption technique using SPLAT pheromone offers a practical and ideal approach to combat cotton pink bollworm, *Pectinophora gossypiella* (Saunders). Large-scale field trials were conducted during 2018-19 and 2019-20 in farmer's fields to evaluate the bio-efficacy and suitability of SPLAT pheromone (sex pheromone-based commercial product) for the management of pink bollworm. The SPLAT pheromone was applied in three split dosages at 65-70, 95-100 and 125-130 days of crop growth using spoons hung on to leaf petioles of top shoots and its efficacy was compared with recommended plant protection (RPP) and untreated control for suppression of pink bollworm incidence. The pink bollworm moth trap catches (2.60 and 2.40 moth/trap/night), average rosette flower (4.33 and 3.60%), green boll damage (6.22 and 7.13%), open boll damage (7.53 and 7.87%) and locule damage (8.75 and 8.42%) during 2018-19 and 2019-20, respectively was less in SPLAT pheromone treated block as compared to RPP and untreated control block. The effective reduction of pink bollworm in SPLAT pheromone treated block resulted in a reduction in green boll damage, which contributed to higher seed cotton yield of 28.85 and 26.50q/ha during 2018-19 and 2019-20, respectively with more net profit. Considering the yield advantage, SPLAT pink bollworm pheromone was found to be an economically viable and promising option for pink bollworm management in *Bt* cotton.

Key words : Cotton, mating disruption, management, pink bollworm, SPLAT pheromone.

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INTRODUCTION

Cotton is a premier commercial fiber crop and the mainstay of Indian economy subjected to ravages of many insect pests *viz.*, sucking pests and bollworms right from seedling stage, their infestation impact cotton yield to an extent of 2.8 to 61.90 per cent loss in seed cotton yield, 2.1 to 47.10 per cent loss in oil content, 10.70 to 59.20 per cent loss in the normal opening of bolls (Patil, 2003). In recent years, pink bollworm (PBW) infestation has aggravated, presumed to have developed resistance to insecticides (Li *et al.*, 1997; Sabry and Nahed, 2013) and to cry toxin of *Bt* cotton (Tabashnik *et al.*, 2004; Tabashnik *et al.*, 2005; Dhurua and Gujar, 2011; Wan *et al.*, 2012; Ojha *et al.*, 2014; Mohan *et al.*, 2015). During 2012-14, Central Institute for Cotton Research (CICR) Nagapur, conducted surveys on pink bollworm, which revealed a survival of larvae of PBW on BG-II in Amreli and Bhavnagar districts in Saurashtra during 2012, 2013 and 2014 (Kranthi, 2015), which led to cotton cultivators to

shift to other crops. Its activity is observed in the later part of the cotton-growing season (Patil and Bheemanna, 1998). Soon after the emergence, the larvae enter into tender bolls. As a result, farmers remain ignorant about the damaging potential of PBW and do not exercise target-specific control measures. Efforts to reduce the damage caused by this pest are made for a decade, but as the early instars enter the bolls immediately after the emergence, the period of exposure to insecticide is very short. Hence, insecticide application is not a viable option. As a possible means to reduce the pesticide load in the environment, behavior-modifying chemicals are a potentially viable alternative to the use of insecticides and are powerful pest management tools to integrate with other management strategies.

The synthetic sex pheromones have acquired a special role in IPM and reached the stage of commercial production and heralded a new era in the management of PBW (Hummel *et al.*, 1973). Recently, sex pheromone,