World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:11, No:10, 2017

Using Polymerase Chain Reaction Technique to Observe the Resistant Strains of Pectinophora gossypiella against Cry1Ac Expressing Cotton

Authors : Zunnu Raen Akhtar, U. Irshad, M. Majid

Abstract : Due to the widespread cultivation of transgenic cotton, intense selection pressure resulted in resistant allele in pink bollworm, Pectinophora gossypiella (Gelechiidae: Lepidoptera). A resistant strain of pink bollworm against transgenic cotton has become a challenge to Integrated Resistance Management (IRM) in the World. Laboratory and field studies were conducted to determine the resistant strains of pink bollworm by performing bioassay, extracting the DNA, conducting PCR of both laboratory as well as field collected pink bollworms to observe the developed resistance. In all of the studies, two Bt varieties FH-142 and FH-118 expressing Cry1Ac compared to non-Bt (Control) were tested against pink bollworm. In the laboratory, bioassay results showed that there was no significant mortality difference between Bt and non-Bt varieties. Similar mortality percentage was observed in transgenic and non-transgenic (control) variety. Insects which were survived after bioassay, as well as those collected from the Bt cotton fields, were selected for further molecular studies. DNA extraction followed by PCR was conducted to check the resistant strains in pink bollworm. In field studies, we also observed the population dynamics of pink boll worms on Bt as compared to non-Bt varieties. Laboratory and field studies confirmed that resistant strains occurs in Pakistani Bt cotton fields. Different strategies should be adopted to combat that serious prevailing resistance issues.

Keywords : transgenic cotton, resistance, pectinophora gossypiella, , integrated resistance management (IRM), polymerase chain reaction (PCR)
Conference Title : ICE 2017 : International Conference on Entomology
Conference Location : Paris, France
Conference Dates : October 19-20, 2017