FIELD FAILURE OF FIRST-GENERATION BT COTTON DOCUMENTED WITH PINK BOLLWORM IN GUJARAT STATE, INDIA

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Abstract

Unusual survival events of *Pectinophora gossypiella* (pink bollworm – PBW) in Bollgard hybrids were documented during the 2009 growing season in the Indian state of Gujarat. An unusual survival event was one in which inspected bolls were infested by live PBW larvae at the rate of 10% or greater. In Gujarat in 2009, Bollgard fields were sampled for PBW damage/infestation. A large proportion of sampled fields met the criterion for unusual survival with numerous bolls containing surviving larvae which had reached at least the 4th larval instar. Subsequent populations of PBW derived from these field-collected larvae survived at high levels in in-vitro bioassays against diagnostic doses of Cry1Ac (1µg/ml; 10µg/ml). These populations were considered resistant to Cry1Ac. In similar assays, these same Cry1Ac-resistant field populations were found to be fully susceptible to Cry2Ab (no survivors at the diagnostic concentration of 10µg/ml). Cry2Ab is the second Cry protein expressed in second-generation Bt cotton (Bollgard II). Factors possibly contributing to the development of Cry1Ac-resistant populations in the field in Gujarat include the illegal deployment of unapproved hybrid Bt events with lower Cry1Ac levels and the accompanying failure to plant refuges adequate to produce sufficient susceptible PBW moths.