

Project Title: Management of whitefly by integrated strategies and development of resistant cotton germplasm through genetic engineering

Role in Project: Team Leader at CCRI, Multan

Sponsor: PARB

Date: 01-Jan-18 - 01-Dec-20

Description:

Cotton whitefly, *Bemisia tabaci* is a polyphagous insect and belongs to the order Hemiptera (family Aleyrodidae). It has been reported in almost 160 plant species belonging to 113 genera of 42 families together with crops, ornamentals, fruit and forest trees, and weeds were recorded as its host during 1996-1999 from Pakistan (Attique et al. 2003). In Pakistan, its infestation is recorded from more than 100 plants belonging to 24 families. The pest has 12 generations in a year and hence remains active in all seasons. A single female carrying virus can infect many host plants. It damages the plant in three different ways i.e., by constantly sucking the cell sap resulting in 50% reduction in boll production, by secreting honeydews on which sooty mold develops (Ahmad et al., 2002) and also acting as a vector of leaf curl virus disease (CLCuV) (Nelson et al., 1998). The average yield loss in Pakistan caused by CLCuV was reported to be 38.7 % during 1993 (Khan and Khan, 1995), which is threatening our cotton-based economy. Whitefly along with other factors have also played a chaos with cotton yield this year as reported by various authors in newspapers. There are different pest control tactics, but the most common and quicker one is that of chemical control which is generally adopted by our farming community. Chemical control of the pests becomes imperative when all other control methods fail to control the target pests but on the other hand indiscriminate use of insecticides has not only caused the resistance problem in these pests but it has also polluted the environment along with other health hazards (Bashir et al., 2001 & Raza and Afzal, 2000). Introduction of newer chemicals in the market and these confounding observations make it necessary to test the efficacy of these compounds against whitefly on regular basis. The baseline data for the development of resistance against the commonly used insecticides is not available for the comparison and development of some suitable control strategies. This aim of this project is to provide the baseline data for the resistance development in whitefly against the commonly used insecticides and to achieve significant advances in IPM strategies against this pest. This is a collaborative project of Department of Entomology, University of Agriculture, Faisalabad(Host Organization); Entomological Research Institute, Ayub Agricultural Research Institute Faisalabad; Department of Entomology, Muhammad Nawaz Shareef University of Agriculture, Multan; Pakistan Atomic Energy Commission(PAEC), Islamabad; National Institute for Biotechnology and Genetic Engineering (NIBGE); CRS, Multan; Central Cotton Research Institute, Multan. The research activities at CCRI, Multan are as under

- Agronomic practices (planting time, spring crops associated with whitefly, weeds or alternative host plants).
- Varietal screening of plant resistance against whitefly.
- Efficacy of different insecticides against whitefly in field and lab condition.
- Resistance monitoring.
- Identification and evaluation of high quality adjuvants.