

Case study — Mealy Bug

Since time immemorial, pests and insects have been the scourge of farmers worldwide. In India, too, attacks on crops are a recurrent reality, despite the widespread use of pesticides and insecticides, which ironically lead to an increase in the resilience of the organisms.

Mealy bug (*Phenacoccus solenopsis*) is one such pest that has reared its ugly head over the past couple of years. During 2002, India first adopted Bt. Cotton and subsequently, the area under cultivation increased to 3.8 million hectares in 2006. Over the past two to three years, the farmers have reaped the benefits of Bt. Cotton with yield gains of 31 per cent, reduction in the number of pesticide sprays by 39 per cent, and an 88 per cent increase in profit per hectare.



As luck would have it, the reduction in the number of insecticide sprayings has probably led to the emergence of the Mealy Bug on cotton during the 2006 crop season, and some damage was reported from pockets of **Bathinda**, **Ferozepur** and **Muktsar** districts of Punjab. Compounded with poor knowledge on tackling this particular situation, the pest spread to further areas within these districts.

It was also reported from Mansa and Faridkot districts. The mild weather, coupled with scanty rainfall, played its part in favouring the survival, and consequent multiplication of the insect pest.

The adult female of Mealy Bug attaches herself to the leaf of the plant, forms two – four ovisacs and lays eggs in them, which hatch into 300 – 400 nymphs. If proper surveillance and appropriate steps are not taken, the whole plant is covered with the pest. Both, the adults and the crawlers suck the sap from the stems, twigs, leaves, flower buds and young bolls, thus ruining the entire cotton plant.

The pest migrates from cotton to weeds, ornamental plants, wild trees, etc. and again to cotton in the subsequent cotton season. The scientists from the **Department of Entomology at the Punjab Agricultural University (PAU), Ludhiana**, were galvanised into action.

An initial survey revealed that the pest thrived on weeds present in the wastelands, water channels, etc. Adopting a wait and watch policy cost the farmers dearly as the delay in cleaning up the surroundings resulted in giving the pest an opportunity to infest cotton and other host crops.

PAU consequently recommended a management strategy as part of its **integrated pest management (IPM)** package on cotton. The strategy includes sowing of recommended varieties, and planting bajra, jowar and maize as barrier crops. Besides, planting the Mealy Bug's host crops such as okra had to be avoided around the cotton fields. Spot treatment should be carried out when the incidence is merely on few cotton plants.

Moreover, it was considered important to prevent the carry over of the pest to the next season, by implementing off-season management strategies. Infested cotton plants / rows needed to be sprayed with recommended insecticides after the last picking was done. Stacking the infested cotton sticks separately and keeping them away from the field area can prevent the carry over of the Mealy Bug.

The removal of weeds such as congress grass, gutputna, peeli buti, etc. which are the alternate hosts of mealy bug, also plays a significant role in managing this pest without the use of insecticides, since it delays its population build up.

Considering the potential ability of the Mealy Bug to cause economic damage, it is necessary to generate information on its biology, besides evolving management strategies to control its spread.

Under its '**Reviving the Green Revolution**' initiative, the Trust is supporting the **Department of Entomology**, over a three-year period towards:

- Studying the biology of the Mealy Bug on cotton and major non-crop hosts (weeds)
- Studying the relative preferences of the Mealy Bug to common cultivars recommended in Punjab
- Evaluating new molecules of particles for the management of the Mealy Bug
- Developing and disseminating non-chemical strategies for Mealy Bug management, including eradication of weeds and use of barrier crops
- Analysing new chemicals for their efficacy against the Mealy Bug

The project is being implemented in four villages each in the districts of Muktsar, Bhatinda and Ferozepur, where the **Department of Agriculture (DoA)**, Government of Punjab, is upscaling the cotton IPM model. With cotton farmers currently spending anything between Rs500 to Rs4,000 per hectare to save their crop from Mealy Bug infestation, the **Department of Entomology's** efforts, in tandem with the **DoA**, can make a significant enhancement to profits reaped by farmers at the time of picking, both in terms of productivity and reducing the costs of production.

Over the past six years, the Trust's '**Reviving the Green Revolution**' initiative has strived to halt the agricultural stagnation that had set in, in Punjab in the recent times. Supporting the Trust in this initiative, the **PAU** and the **DoA** have made considerable inroads in reviving agricultural growth in the state, through some cutting-edge research and demonstrating its benefits to farmers.

Efforts having paid off in Punjab, the Trust, during 2007-08, spread its engagement with the agricultural sector to Tamil Nadu, through supporting five new projects with the **Tamil Nadu Agricultural University, Coimbatore**, with a view to ensure inclusiveness in growth and agricultural dynamism, which more importantly, is in sync with the Eleventh Five Year Plan of the Government of India.