BT COTTON IS A FAILURE

Dr. Suman Sahai

Gene Campaign has conducted a small field study to collect data on the performance of *Bt*. cotton and non-*Bt*. cotton. The survey was conducted in selected locations in Maharashtra and Andhra Pradesh and included a total of 100 farming families selected by random sampling. The Bt cotton varieties compared were *Bt*. 162 and *Bt*. 184 belonging to Mahyco-Monsanto and the non-Bt cotton varieties were the local hybrids Brahma and Banny.

Bt cotton yields lower

Average yield per acre was found to be lower in the case of Bt cotton in all categories of land holdings. Non-Bt cotton varieties yielded between 15 and 17 percent more than the Bt cotton.

Poor quality cotton

The Bt cotton was found to be a shorter duration crop (90-100 days) than the non-Bt cotton (100 to 120 days) but the plants showed less vigorous growth, with fewer branches and smaller leaves. A major problem reported everywhere was the premature dropping of bolls in Bt cotton which were on average smaller in size than the non Bt cotton bolls.

A comparison showed fewer bolls and shorter fibre length in Bt cotton. Non-*Bt*. cotton was graded as A and B quality whereas Bt. cotton was graded as B and C, fetching on an average Rs. 300/quintal less on the market.

No resistance to pink bollworm

One of the most significant findings of this study was the indication that these Bt cotton varieties do not offer protection against pink bollworm (*Pectinophora gossypiella*). Pink bollworm attack was found to be severe after 60 to 70 days. There are two possible reasons for this. The first is that the period of expression of the Bt endotoxin does not coincide with the time of the bollworm attack. The other explanation is that the pink bollworm is not susceptible to the Bt endotoxin.

The latter theory receives support from scientific literature. Morin et al, (2003) report that field populations of pink bollworm harbour three genetic mutations that confer resistance to Bt toxin.

Economics of Bt cotton cultivation

The economics of cultivating Bt cotton is clearly not in favour of farmers. The seed is about four times more expensive than the good local hybrids. The difference in the price of seed is approximately Rs. 1200 per (450 gm) bag, while savings on pesticide averaged only Rs. 217 per acre.

The total investment per acre is much higher for Bt cotton than for non-Bt cotton varieties. The Bt cotton farmer had to invest on average, Rs. 983 more per acre than his non-Bt counterpart.

Net profit from Bt cotton was lower per acre compared to non-Bt cotton in all types of fields (low to high yielding). In fact, *60 % of the farmers cultivating Bt cotton were not even able to recover their investment and incurred losses averaging Rs. 79 per acre*

Why the Mahyco-Monsanto cotton failed

A number of factors have probably contributed to the failure of Mahyco-Monsanto's Bt cotton. The first is the poor quality of the varieties. It is known that MECH 162 and MECH 184, which were transformed to Bt 162 and Bt 184, are poor to modest performers. A better variety would give a better Bt cotton so the GEAC must answer why it approved this Bt cotton when better quality Bt cotton hybrids belonging to Indian companies are in the pipeline.

Because of the expensive seeds and modest pesticide saving, the economics of the Bt crop is not favourable for the farmer. Tilting the balance further is the fact that Bt cotton must be grown with a refuge, necessary for resistance management. This is recommended as 20 % of the cultivated area by the GEAC. "Wasting" 20 % of the land on managing resistance makes the Bt cotton even more nonviable, especially for small farmers.

A further problem appears to be the vulnerability of Bt cotton to pink bollworm, which is a significant cotton pest in India. If this is indeed the case as the study demonstrates, then the Bt strategy for cotton is likely to fail because if the Bt endotoxin protects only against the green bollworm and not against the pink bollworm, then farmers will have to continue pesticide sprays.

No Regulatory Structures set up

One of the most shocking revelations of this investigation was the fact that neither State Level nor District Level Committees had been set up in either Maharashtra or Andhra Pradesh where Bt cotton was being commercially grown. This is a breach of law and a direct violation of the prescribed rules for the manufacture, use, import, export and storage of hazardous microorganisms and genetically engineered organisms and cells, under the Environment Protection Act, 1989.

GENE CAMPAIGN

Email - genecamp@vsnl.com
Web - http://www.genecampaign.org