

BT COTTON REPORT FROM GOVERNMENT RESEARCH INSTITUTE SHOWS INDIAN BT TECHNOLOGY FAULTY.

Dr. Suman Sahai

A new report published by scientists at the Central Institute for Cotton Research (CICR), Nagpur, in the 25 July issue of Current Science, validates many of the observations made by Gene Campaign during three years of field studies on Bt cotton cultivation. The study conducted at India's premier cotton research institution gives the scientific reasons for the failure of the Monsanto Bt cotton varieties and shows that India's Bt cotton technology itself is faulty and will fail to protect cotton farmers from the bollworm. The study recommends additional pesticide sprays since the Bt technology fails to provide adequate protection.

The principal findings of Gene Campaign's field studies have been validated by the CICR study, like the finding that pesticide savings are not significant in India. Gene Campaign studies had found that protection offered by Bt cotton hybrids lasts only up to about 90 days, after which the effect wears off. The CICR study also reports that protection falls off after 110 days because the Bt gene does not express properly after that. Like the GC study, also, the CICR study finds that bollworm attack the bolls and they provide the scientific data that Bt toxin expression was the lowest in the economically most important part of the cotton plant, the bolls themselves.

Another feature of the Bt cotton hybrids reported by Gene Campaign was the premature dropping of cotton bolls. Investigations into old documents in the US revealed that boll dropping was reported already in 1997- 98 in the US by farmers who had cultivated Monsanto's GM cotton. Monsanto had settled damages worth million of dollars to reimburse farmers who had suffered losses in Mississippi, US A. This may be contrasted with Monsanto-Mahyco's brash arrogance in India where they have flatly refused to pay any compensation to farmers who have suffered tremendous losses. As the pliant GEAC has looked on benevolently without taking any action, the AP government has had to resort to banning the Mahyco- Monsanto seeds from AP, but they have not been able to force the company to reimburse losses, like in the US.

The CICR scientists have shown that the Indian Bt cotton technology, being used by all agencies, is flawed. Bt cotton hybrids being produced in India were unstable and unpredictable, the result of faulty technology in which gene expression is variable, showing declining levels of Bt toxin in the same season. This means that since the Bt cotton does not provide adequate protection, farmers must use chemical pesticides to protect their crops. This is in consonance with earlier findings that the Mahyco-Monsanto cotton failed to protect against bollworm, farmers had to use chemical pesticides, and hence savings on pesticide were not significant.

The CICR study collaborates what civil society groups have been saying, that the Bt technology being used was not suited for cotton cultivation in India since the pest profile here was very different to the pest profile in the US. And since Bt technology was developed for the cotton pests in the US, it was unlikely to work for us here. Now the CICR study has very clearly shown that Bt cotton cannot be effective in India because the major cotton pest here, the bollworm, is not susceptible to the Cry1Ac toxin of Bt cotton. Cry1Ac works against the tobacco budworm, *Heliothis virescens* which is the major pest of cotton in USA. Bt cotton varieties in USA cause 99-100 % mortality in *Heliothis*, hence they are successful in providing protection. The Cry1Ac based technology cannot ever really succeed in India.

Further unbundling the scientific basis for the failure of India's Bt cotton, the CICR study suggests that poor Bt cotton performance in India is possibly due to the fact that in India, Bt cotton is produced as a *hemizygous hybrid* (gene expression in only one parent), compared to the *homozygous* form of the composite **varieties** which are produced in other countries like China, Australia and South Africa.

Global analysis of Bt cotton performance shows that performance is better in true breeding varieties as compared to the hybrids, that are being produced in India. This explains to some extent the positive reports from China.

The primary question that Indian regulators must answer is, why are Bt cotton **hybrids** being promoted, when they will force the farmer to buy seeds for every new planting? Why did the GEAC not take the decision that only **true breeding varieties** of Bt cotton would be permitted in India, not only because they perform better but also because they would be a cheaper option for farmers who could save seeds for the next harvest? Gene Campaign demands an enquiry into the considerations that have prompted the GEAC to take such a distinctly anti-farmer decision. The members of the GEAC must be held accountable for the losses faced by farmers, leading sometimes to their taking extreme steps.

The issue of the lack of competence in the Genetically Engineering Approval Committee (GEAC) and its inability to take any decisions with respect to technical issues like Bt cotton has been raised in a number of forums. The GEAC simply lacks the competence to understand the technical data that are presented for evaluation. Its overwhelmingly bureaucratic composition precludes any understanding of the subject matter which is way over the heads of the slew of joint , additional, under and over secretaries that man this ultimate decision making body. As the GEAC placates the big industry and continues to release batches of Bt cotton to ever new regions of India, without any review of past failures, nor any attempt to get compensation for farmers who have suffered losses, civil society must question the motivations and allegiance of this public regulatory body. It may be recalled that Gene Campaign had earlier asked for a CBI enquiry into the nature and process of decision making by the regulatory agencies.

What the GEAC is doing with respect to Bt cotton amounts to criminal negligence. Its biased decisions are resulting in debilitating losses for poor farmers, specially in rainfed areas. Gene Campaign was waiting for the Right to Information Act to come into effect, to force the GEAC to make public the data on biosafety and performance tests and the basis of decision making that is leading to all these pro-industry decisions. Biosafety data belong in the public domain and it is illegitimate to withhold it, as the GEAC continues to do.

Gene Campaign demands that Bt cotton hybrids be withdrawn from the fields and a moratorium placed on any further cultivation of Bt cotton until the technology is vastly improved. Mahyco -Monsanto must be made to pay compensation for losses incurred by farmers. Also, Bt cotton must be permitted in India only in the form of true breeding varieties like is the case in China, Australia and South Africa, not as hybrids the way industry is pushing here. Finally Gene Campaign demands that the GEAC be disbanded immediately and a more transparent structure with visible technical competence put in its place. The GEAC cannot be allowed to play Lotto with the future of India's farmers as they pander to the wishes of the industry.