

Bt Cotton: Farmers' Reactions

A field study in Andhra Pradesh elicited the views of farmers in two districts in the state on the efficacy of Bt cotton in withstanding pest attacks, use of pesticides, compliance with government norms, and farmers' willingness to continue with cultivation of Bt cotton in the coming seasons.

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I Introduction

The Genetic Engineering Approval Committee (GEAC) of the ministry of environment and forest sanctioned commercial cultivation of Bt cotton from the current kharif season amidst much controversy. Some environmentalists have been fiercely opposing the cultivation and some of them, even filing PIL petitions against the grant of approval for cultivation.¹ However, companies like Mahyco-Monsanto and some indigenous alliances of breeders are keen to promote cultivation of Bt cotton.² Scientists like Norman Borlaug, the pioneer of 'green revolution', have also expressed the need for adoption of transgenic crops in countries like India [Borlaug 2002]. ICAR has also recently certified that cultivation of Bt cotton is found to be safe as per its own trials. The government, media, researchers and experts have been expressing their opinions on the issue. Yet there is no systematic effort to ascertain the opinions of the farmers, who are the major stakeholders. In this commentary, we provide details of first reactions of farmers on cultivation of Bt cotton in Warangal and Khammam districts of the Telangana region of Andhra Pradesh. Bt cotton being cultivated in about 1,500 acres belonging to around 1,000 farmers in Warangal and in about 750 acres in Khammam belonging to about 750 farmers. This region is important as far as cultivation of cotton is concerned, and in the past few years, several cases of suicides of cotton farmers were also reported from this region. A field study was conducted in the last week of September and first week of October 2002, in 15 mandals of the two districts and about 90 farmers were contacted and individual responses elicited through questionnaires on various issues related to Bt cotton

farming. It was difficult to contact more farmers because Bt cotton cultivation was widely dispersed and only three or four farmers per village in select villages were supplied with Bt cotton seeds for cultivation over an area of one or two acres each. The number of farmers contacted constitutes about 4 per cent of the total number of farmers who are cultivating Bt cotton and experience shows that the responses of other farmers may not be much different.

II Opting for Bt Cotton

At the outset, the study tried to ascertain the main reasons why a farmer was growing Bt cotton, and six possibilities were posed to the farmers without assigning any priority, i.e., they could select as many reasons as possible. The responses are tabulated in the table.

The table clearly reflects the output orientation in the thinking of the Indian farmer. Yield is given preference over quality. The table also clearly reflects the fact that the seed dealer is the de facto counsellor for the farmer and it is propaganda that can make or mar things.

Further probing revealed that farmers were expecting a reduction in pesticide expenditure by up to 30-40 per cent. (Pesticide expenditure in the past used to command up to 80 per cent of the total expenditure incurred on cultivation of cotton.) However, practical experiences reveal that there is not much reduction in

expenditure on pesticides and this could be due to lack of awareness or due to the fact that Bt cotton is grown over a minor fraction of the total area under cotton cultivation and farmers were spraying the same amount of pesticide on all the fields irrespective of whether Bt cotton or non-Bt cotton is grown.

On the yield front, the general expectation of farmers is an increase of 30-40 per cent, but it is widely felt amongst farmers as well as breeders that the hybrid variety of Mahyco into which Bt gene has been introduced is not a superior variety. Farmers and breeders in general feel that drought-tolerant hybrid varieties like 'Bunny' or 'Brahma' or their generic clones are far superior and if Bt gene could be introduced in these hybrids, superior performance could be obtained. Enquiries were made about whether any seed dealer promised any specific yield and the answer was a universal no. On the germination point, one of the authors, who himself is a breeder, could notice that average germination rate varied from 70 per cent to 80 per cent in the case of both Bt cotton and non-Bt cotton.

III Effectiveness in Containing Bollworm

A general observation is that in the current season, pest attack is lower and this may be due to climatic conditions or due to the fact that acreage under cotton cultivation has gone down considerably (by about 50 per cent) due to bad experiences of farmers last year. This could be corroborated by the fact that even in the current season, pest attack is severe in the northern region of Warangal (six mandals of Atmakur, Shayampet, Parkal, Hasanparthy, Duggondi and Geesukonda) where acreage under cotton cultivation is on the higher side than in the southern region of the district. During the field study, physical examination revealed that in the northern region of Warangal, where pest attack is severe, on average, bollworm

Table: Reasons Given by Farmers for Growing Bt Cotton

Reason Expressed by the Farmer	Affirmative Responses Out of 90	Percentage of Affirmative Responses (Rounded off to Nearest Unit)
Expecting reduction in expenditure on pesticides	65	72
Expecting more yield	83	92
Expecting good quality of cotton	50	56
Because I was selected to grow Bt	11	12
Because, others are growing Bt	14	16
Attracted due to propaganda of seed company	72	80

attack was about 30 per cent lower on Bt cotton than on non-Bt cotton. In some fields, damage due to bollworm attack was as high as 80 per cent in case of non-Bt cotton, whereas damage to Bt cotton was up to 40 per cent. It was observed that most of the farmers surveyed had already sprayed pesticides 4-5 times and no distinction of Bt or non-Bt was made for spraying pesticides.

The damage due to bollworm attack was lower in areas where pest attack is not severe. In fact, in some villages in south Warangal and Khammam, farmers did not spray any pesticide. This may be due to the fact that there is no intensive cultivation of cotton in these areas and cotton crops stand amidst of crops of maize, red gram and castor. As the cost of Bt seed is at least four times higher than that of normal hybrid seed, cultivation of Bt cotton may be economically sensible only when the pest attack is above a certain threshold infestation level. Even studies conducted in the US reiterate that cultivation of Bt cotton is beneficial only when the pest attack is above a threshold level [Cornejo and McBride 2000]. Our experience shows that pest attack would be high when cotton cultivation is high. One solution to this problem could be encouraging practices of crop rotation and crop diversification.

Performance of Bt cotton in terms of growth and boll formation was on par with non-Bt cotton hybrids as far as soils under irrigation or non-irrigated black soils are concerned. In case of non-irrigated red soils, performance of Bt was poor compared with that of hybrids like 'Bunny' or 'Brahma'. As already mentioned, this lack of performance should not be attributed to Bt gene but to the hybrid variety into which the Bt gene is introduced.

Attempts were made to ascertain if there is any visible environmental damage caused by Bt gene to worms, insects, butterflies or birds. Physical inspection as well as enquiries made with farmers revealed that there is visible damage caused due to Bt gene to the environment. However, it may be stated that the growth of Bt cotton being on a minor fraction of the total acreage under cultivation (only 4-5 acres per village), effects on the environment because of large-scale cultivation could not be studied.

IV Farmers and Bt Cotton

All except two farmers were positive about cultivation of Bt cotton even for the coming seasons. The two farmers who did

not want to cultivate Bt, again were sceptical because even after spending huge amounts on seed, the crop was not resistant to the severe drought faced by them. However, about 30 per cent of the farmers said they would cultivate cotton only if they received suitable price in the market. None of the farmers opposed cultivation of Bt cotton on technical reasons. This shows that the concerns of farmers are in opposition to the concerns of some environmentalists. These results are directly in contradiction to the observations made by Sahai (2002), who states that: "Faced with defiant farmers who do not see the logic of 'wasting' 20 per cent of their land, the government is now finding it difficult to convince farmers that this fantastic technology they were promoting all along, does indeed have a downside. Scientists and agriculture departments are already admitting that they have a problem on their hands since the farmers do not intend to follow any instructions about demarcating insect refuges." At least in the areas surveyed by us the government did not try to convince the farmers to grow Bt cotton, nor are scientists and agriculture department having a problem. This shows that the concerns of farmers are in opposition to the concerns of some of the environmentalists, at least in Warangal and Khammam. Our observations are corroborated by reports from elsewhere. For example, newspaper reports indicate that farmers in Punjab are keen to grow Bt cotton [Singh 2002]. Further, our studies show that farmers are willingly complying with the norms.

With regard to compliance with norms set by GEAC, it was found that all the farmers are growing non-Bt cotton as a shield to Bt cotton as per norms laid down by GEAC. Regarding monitoring of genetically modified crops, in all of the villages surveyed by us, farmers said no government functionary from the agricultural department or any other department had visited the fields till date to study the effects on the environment or even to find out whether norms set by GEAC were being complied with. The seed dealers are the only occasional visitors.

In conclusion, first reactions from farmers cultivating cotton crop in Warangal and Khammam show that considerations of yield are still the primary concern, propaganda is the major force in decision-making and seed dealers act as effective crop counsellors. It may also be stated that damage to crop due to

bollworm is considerably less in Bt cotton than non-Bt cotton only under conditions of severe pest attack. Further, there is not much reduction in pesticide expenditure because farmers still do not distinguish between Bt and non-Bt at the time of spraying pesticides. None of the farmers are opposed to Bt cotton on technical considerations and they would like to grow Bt cotton even for the coming seasons, if it is a commercially viable proposition. This shows that the feelings of environmentalists are not in tune with the feelings of farmers. Regarding monitoring of norms set by GEAC, they are being complied with by the farmers but none of the government officials had visited any farm till date to ascertain whether the norms were complied with or to study the impact on the environment. The seed dealer is the only occasional visitor. Therefore, it may be stated that there is vast potential for cultivation of Bt cotton and at present, the space is fully dominated by the MNC alliance of Mahyco-Monsanto. Farmers are eager to take up Bt technology and the government should take immediate measures to release Indian varieties of Bt cotton so that farmers can enjoy the fruits of the technology at low cost. [17]

Notes

- 1 Private communication reveals that P M Bhargava has filed a PIL before Andhra Pradesh High Court against grant of approval to Mahyco-Monsanto which was dismissed by the Honourable Court. Further details regarding appeal, etc, are not known.
- 2 Recently, eight Indian companies have formed a consortium called Swadeshi Biotechnics to jointly explore possibilities of obtaining and commercialising Bt technology

References

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