CONSTRAINTS FACED BY THE BT COTTON GROWERS OF MAHESANA DISTRICT IN ADOPTION OF RECOMMENDED PLANT PROTECTION MEASURES

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ABSTRACT

In cotton insect pest problems are persisting and farmers are facing constraints on controlling the pest diseases even with introduction of BT genes. Therefore this study was conducted in Mehsana district as the district is the most potential for production and productivity of Bt. cotton. Two talukas viz., Vijapur and Visnagar and Six villages from each taluka were selected randomly. From each selected villages, 10 Bt. cotton growers were selected randomly. Hence, the final sample size was 120 Bt. cotton growers. Ex-post facto research design was used for the study. It is found that unqualified dealers, high cost of chemicals, dealers misleading the farmers, poor quality of chemicals, non-availability of chemicals in time, spraying of chemicals involves more labours, lack of knowledge regarding identification of pests and disease and lack of knowledge about the recommended pesticides were the important constraints faced by the farmers in adoption of recommended plant protection measures of Bt. Cotton.

Keywords: *recommended plant protection measures bt cotton growers sontraints*

INTRODUCTION

Bt. cotton (*Gossypium hirsutum* L.) is one of the most important fiber crop grown on a large scale almost in all the tropical and sub-tropical countries like India, USA, Mexico, Iran, Egypt, Pakistan, Turkey, Brazil, Sudan, Uganda and China. Agricultural development continues to remain the most important objective of Indian planning and policy. In the process of development of agriculture, pesticides have become an important tool as a plant protection agent for boosting food production. A vast majority of the population in India is engaged in agriculture and is therefore, exposed to the pesticides used in agriculture. India is the 13th largest exporter of pesticides and disinfectants in the world and in terms of volume is the 12th largest producer of chemicals with a value of US Dollar 0.6 billion. (Patel, 2006$_c$)

India has registered a significant increase in cotton area from 7.7 million hectares in 2002-03 to 12.25 million hectares in 2013-14 the highest ever cotton area in the history of Indian cotton. India sustained the growth of cotton primarily due to the introduction and rapid adoption of dual gene Bt. cotton technology coupled with a large scale hybridization of cotton area, supply of good quality seeds by private sector and untiring efforts by approximately 8 million cotton farmers in the country. Coincidental with the steep increase in adoption of Bt. cotton between 2002 and 2014, the average yield of cotton in India, which used to have one of the lowest yields in the world, increased from 308 kg per hectare in 2001-02, to 567 kg per hectare in 2007-08 and continue to hover close to 500 kg per hectare in 2011-12 before reaching the highest national cotton yield of 570 kg per hectare in 2013-14. The major cotton growing districts in Gujarat are Mehsana, Surendranagar, Baroda, Bharuch, Ahmedabad and Sabarkantha.

OBJECTIVE

To identify the constraints faced by the Bt. cotton growers in adoption of recommend plant protection measures and to seek suggestions to overcome the constraints

METHODOLGY

Ex-post facto research design was used for the study. Mahesana district of Gujarat State was selected purposively as the district is considered as the most potential

for production and productivity of Bt. cotton. Two talukas *viz.,* Vijapur and Visnagar having possibility of increasing productivity of Bt. cotton were selected randomly for this study. Six villages were selected randomly from the list of Bt. cotton growing villages from each taluka under Bt. cotton cultivation. Thus, total twelve villages were selected. From each selected villages, ten Bt. cotton growers were selected randomly. Hence, the final sample size was 120 Bt. cotton growers. The data were collected by personal contact method with the help of structured interview schedule and collected data were coded, classified, tabulated and analyzed in light of objectives and in order to make the findings realistic for drawing meaningful interpretation.

RESULTS AND DISCUSSION

Constraints in adoption of recommended plant protection measures of Bt. cotton are never ended. However, they can be minimized if known to policy makers and planners. During the course of present investigation, the respondents expressed many constraints which were grouped into three categories *viz.,* (i) input-supply, (ii) economic (iii) technological constraints.

The Bt. cotton growers might be facing certain problems in adoption of recommended plant protection measures of Bt. cotton. Due to such constraints, they cannot adopt all the technology and hence could not make the Bt. cotton crop profitable.

The constraints were operationally defined as the difficulties experienced by the Bt. cotton growers in adoption of recommended plant protection measures. For knowing constraints faced by the Bt. cotton growers in adoption of recommended plant protection measures of Bt. cotton the respondents were asked to give the constraints actually faced by them. Later on the frequency of each constraint was counted and converted into percentage and ranks were assigned.

Considering the constraints faced by the respondents and to overcome the same in adoption of recommended plant protection measure successfully, they were asked to give their valuable suggestions. The suggestions offered by them were ranked on the basis of frequency and percentage.

The respondents were asked to give the constraints faced by them in adopting recommended plant protection measures of Bt. cotton crop. The information collected was tabulated and frequency and percentage for each constraint was calculated. Then, the ranks were assigned to the constraints. The constraints were ranked on the basis of mean weighted scores. The responses of the respondents with regards to the constraints are presented in Table 1 .

Table 1 : Distribution of the respondents according to constraints faced by them in adoption of recommended plant protection measures **n=120**

Sr. No.	Constraints	Frequency	percentage	Rank	Overall Rank
A.	**Input-Supply Constraints**				
1	Unqualified dealers	98	81.66	I	**I**
2	Dealers misleading the farmers	91	75.83	II	**III**
3	Poor quality of chemicals	85	70.83	III	**IV**
4	Non-availability of chemicals in time.	84	70.00	IV	**V**
5	Non-availability of pest resistance varieties of Bt. cotton crop	61	50.84	V	**XIII**
6	Non-availability of spraying equipments	22	18.33	VI	**XV**
B	**Economicalconstraints**				
1	High cost of chemicals	96	80.00	I	**II**
2	Spraying of chemicals involves more labours	83	69.16	II	**VI**
3	Fluctuations in market price of chemicals	77	64.16	III	**IX**
4	Different chemical requires different sprayers	62	51.66	IV	**XI**
C	**Technological Constraints**				
1	Lack of knowledge regarding identification of pests and diseases	81	67.50	I	**VII**
2	Lack of knowledge about the recommended pesticides	80	66.66	II	**VIII**
3	Lack of technical advice timely	69	57.50	III	**X**
4	Lack of skill for proper use of chemicals	61	50.83	IV	**XIV**
5	Difficulty in handling spraying equipments	71	51.16	V	**XII**

It is apparent from Table 4.18 that the major input-supply constraints reported by Bt. cotton growers were unqualified dealers (81.66 per cent), dealers misleading the farmers (75.83 per cent), poor quality of chemicals (70.83 per cent), non-availability of chemicals in time (70.00 per cent), non-availability of pest resistance varieties of Bt. cotton crop (50.83 per cent) and non-availability of spraying equipments (18.33 per cent) and ranked first, second, third, fourth, fifth and sixth, respectively.

Whereas, major economic constraints endorsed by the Bt. cotton growers were; high cost of chemicals (80.00 per cent), spraying of chemicals involves more labours (69.16 per cent), fluctuations in market price of chemicals (64.16 per cent), different chemicals require different sprayers (51.66 per cent) were ranked first, second, third and fourth respectively.

As regarding technological constraints faced by Bt. cotton growers were lack of knowledge regarding identification of pests and diseases (67.50 per cent), lack of knowledge about recommended pesticides (66.66 per cent), lack of technical advice timely (57.50 per cent), lack of skill for proper use of chemicals (50.84 per cent) and difficulty in handling spraying equipments (51.16 per cent) and ranked first, second, third, fourth and fifth respectively.

The most important overall constraints as perceived by the Bt. cotton growers in adoption of recommended plant protection measures of Bt. cotton were; unqualified dealers (81.66 per cent) , high cost of chemicals (80.00 per cent), dealers misleading the farmers (75.83 per cent),poor quality of chemicals (70.83 per cent), non-availability of chemicals in time (70.00 per cent), Spraying of chemicals involves more labours (69.16 per cent), lack of knowledge regarding identification of pest and disease (67.50 per cent) and lack of knowledge about the recommended pesticides (66.66 per cent) were ranked first to eighth, respectively .

Thus, it can be concluded that the main important constraints perceived by the Bt. cotton growers in adoption of recommended plant protection measures of Bt. cotton; unqualified dealers, high cost of chemicals, dealers misleading the farmers, poor quality of chemicals, non-availability of chemicals in time, spraying of chemicals involves more labours, lack of knowledge regarding identification of pests and disease and lack of knowledge about the recommended pesticides.

These findings are in line with the findings reported by Katole *et al.* (1998), Jana and Verma, (2003), Rathod (2009) and Chaudhary (2012).

Table 2: Suggestions given by the Bt. cotton growers to overcome the constraints faced by them n=120

Sr. No.	Suggestions	Frequency	Percentage	Rank
1	Plant protection chemicals should be provided at reasonable rate	120	100.00	I
2	Credit should be provided at reasonable rate	108	90.66	II
3	Pest and disease resistance varieties of Bt. cotton should be developed	102	82.70	III
4	Adequate supply of plant protection inputs should be made timely available	84	69.50	IV
5	Strong marketing network for pesticides availability should be developed in the village	75	62.50	V
6	Training programmes on insect-pest management should be organized by extension personnel	65	56.33	VI
7	Technical guidance should be provided	62	50.90	VII
8	Method demonstrations should be conducted on farmers' fields to develop skill for proper use of chemicals	48	40.17	VIII

The data given in Table 2 reveal that the major suggestions offered by the Bt. cotton growers to overcome the constraints associated with the recommended plant protection measures of Bt. cotton in sequential order were; plant protection chemicals should be provided at reasonable rate (100.00 per cent), credit should be provided at reasonable rate (90.66 per cent), pest and disease resistance varieties of Bt. cotton crop should be developed (82.70 per cent), adequate supply of plant protection inputs should be made timely available (69.50 per cent),Strong marketing network for pesticides availability should be developed in the village (62.50 per cent), training programmes on insect-pest management should be organized by extension personnel (56.33 per cent), technical guidance should be provided (50.90 per cent) and method demonstrations should be conducted on farmers' fields to develop skill for proper use of chemicals (40.17 per cent) and ranked first to eighth, respectively.

From the above result it can be concluded that plant protection chemicals should be provided at reasonable rate, credit should be provided at reasonable rate, pest and disease resistance varieties of Bt. cotton crop should be developed, adequate supply of plant protection inputs should be made timely available, training programmes on insect-pest management should be organized by extension personnel, were the important suggestion offered by the Bt. cotton growers to overcome constraints perceived by them.

The finding has been supported by the finding of Patel (2006_c), Rathod (2009), Patel and Vyas (2015) and Chaudhry (2012).

CONCLUSION

It can be concluded that the important constraints perceived by the Bt. cotton growers were unqualified dealers, high cost of chemicals, dealers misleading the farmers, poor quality of chemicals, non-availability of chemicals in time, spraying of chemicals involves more labours, lack of knowledge regarding identification of pests and disease and lack of knowledge about the recommended pesticides in adoption of recommended plant protection measures of Bt. Cotton. Hence, the training for the pesticide dealer may be arranged so that they become able to guide the farmers regarding the use of pesticides.

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