Research Article

# KNOWLEDGE AND ATTITUDE OF BT. COTTON GROWERS ABOUT INTEGRATED PEST MANAGEMENT

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**Abstract-** The study was carried in Mehsana districts of Gujarat state. It was selected purposively as the district is considered as the most potential for production and productivity of Bt. Cotton. The purpose of the study was to identify the knowledge and attitude level of Bt. cotton about in integrated pest management practices. Multistage Random Sampling technique was used to select 120 farmers from 12 villages of Vijapur and Visanagar taluka. The result showed that the knowledge mean score index regarding sucking pest and its control, seed treatment, spraying equipments, disease and its control, bollworm control and care and management in using pesticide was observed higher in comparison to practices *viz.*, physiological disorder, use of bio-pesticide, predators and sticky trap respectively. Further result showed that nearly three-fourth (73.33 per cent) of the Bt. cotton growers were having moderately favorable attitude towards the use of pesticides in Bt. cotton, followed by 16.67 per cent and 10.00 per cent of the Bt. cotton growers had less favorable and highly favorable attitude towards the use of pesticides, respectively.

**Keywords** Attitude, Knowledge, Integrated Pest Management, Bt. cotton growers.

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## 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**) [6].

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. In Gujarat total area under cotton cultivation is 26.33 lakh hectares of which 21.33 lakh hectares are under Bt. cotton cultivation and production of 105.00 lakh bales are under Bt. cotton. The major cotton growing districts in Gujarat are Mehsana, Surendranagar, Baroda, Bharuch, Ahmedabad and Sabarkantha [1].

## Objectives

(1) To know the attitude of Bt. cotton growers towards use of pesticides.
(2) To measure the knowledge level of Bt. cotton growers about Integrated Pest Management.

## Materials and Methods

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.

To measure the attitude of Bt. cotton growers towards recommended plant protection measures teacher made test was developed after consulting scientists and extension personnel. This schedule consisted of sixteen statements. The responses of the respondents were obtained against each item in terms of their agreement and disagreement with the statement on a five point continuum *viz.,* strongly agrees, agree, undecided, disagree and strongly disagree. The attitude score of an individual respondent was the sum of total score of all the statements in the schedule. The maximum score one can obtain 80 and minimum 16 score. The respondents were classified into three categories *viz.,* Less, Moderately and Highly favourable attitude toward using pesticides on the basis of mean and standard deviation.

For measuring knowledge about recommended integrated pest management of Bt. Cotton growers, teacher made knowledge test was constructed. Then, the test was administrated to respondents for obtaining their responses. Each correct answer was given one score and zero for incorrect answer. The score consist total 73 items. So that one can obtain maximum 73 score and minimum 0 score. The score on each item was then added to arrive at total knowledge score of a respondent. The knowledge index was calculated and the respondents were classified into three categories viz., low, medium and high knowledge level on the basis of mean and standard deviation. Further the assessment of practice-wise level of knowledge about recommended plant protection measures of Bt. cotton among the Bt. cotton growers was also made. The practice wise knowledge score was calculated for each plant protection measures and the mean score knowledge index was calculated by using formula and Practice wise mean score index of knowledge thus obtained and ranked on the basis of higher mean score in descending order.

**Result and Discussion**
**Attitude of Respondents towards Use of Pesticides**
Attitude of the cultivator is very important for the use of any new agricultural technology. If the cultivator has positive attitude or positive behaviour about new technology, they can easily adopt or properly use the pesticides. Here, an attempt has been made to study the attitude of Bt. cotton growers towards the use of pesticides in Bt. cotton crop. The data in this regard are presented in [Table-1].

**Table-1** *Distribution of the Bt. cotton growers according to their attitude towards the use of pesticides*

| Sr. No. | Attitude | Frequency | Per cent |
|---------|----------|-----------|----------|
| 1. | Less favourable (below 36.16 score) | 20 | 16.67 |
| 2. | Moderately favourable ( 36.16 to 44.42 score) | 88 | 73.33 |
| 3. | Highly favourable (above 44.42 score) | 12 | 10.00 |
| | **Total** | **120** | **100.00** |
| | Mean = 40.29 | | S.D. = 4.13 |

The data presented in [Table-1] show that nearly three-fourth (73.33 per cent) of the Bt. cotton growers were having moderately favorable attitude towards the use of pesticides in Bt. cotton, followed by 16.67 per cent and 10.00 per cent of the Bt. cotton growers had less favorable and highly favorable attitude towards the use of pesticides, respectively.
It can be concluded that a great majority (73.33 per cent) of the Bt. cotton growers had moderately favorable attitude towards the use of pesticides. This might be due to the reason that majority of the respondents were educated and had medium level of extension participation which in turn might have played a major

role in building up favorable attitude among Bt. cotton growers towards use of pesticides.
This finding is similar to the findings reported by Patel et al. (2007), Tilara (2009) and Chaudhary (2012) [2,7,8].

**Knowledge Level Regarding Integrated Pest Management In Bt. cotton**
Knowledge is understood information possessed by individual. The knowledge index was calculated and the respondents were classified into three categories viz., Low, Medium and High knowledge level on the basis of mean and standard deviation. The data in this regard are presented in [Table-2].

**Table-2** *Distribution of the Bt. cotton growers according to their level of knowledge regarding integrated pest management in Bt. cotton*

| Sr. No. | Category | Frequency | Per cent |
|---------|----------|-----------|----------|
| 1. | Low  (below 56.12 score) | 24 | 20.00 |
| 2. | Medium ( 56.12 to 80.66 score) | 79 | 65.83 |
| 3. | High (above 80.66 score) | 17 | 14.17 |
| | **Total** | **120** | **100.00** |
| | Mean =68.39 | | S.D. = 12.27 |

It is clear from the data in [Table-2] that nearly two-third (65.83 per cent) of the Bt. cotton growers had medium level of knowledge regarding integrated pest management in Bt. cotton, followed by 20.00 per cent and 14.17 per cent who had low level and high level of knowledge about IPM practices of Bt. cotton, respectively.
On the basis of above results, it can be concluded that a large majority (80.00 per cent) of the respondents were found with medium to high level of knowledge about integrated pest management practices of Bt. cotton crop. The probable reason for above finding might be due to their education, high farming experience in Bt. cotton cultivation, frequent extension contacts and medium level of utilization of information sources.
This finding is similar to the findings of Manohar et al. (2012), Chaudhary (2012), and Godse et al. (2014) [2,4,5].

**Practice wise Knowledge Level about Integrated Pest Management Practices among BT. Cotton Growers.**
In the present study, knowledge refers to know-how about different integrated pest management practices of Bt. cotton crop possessed by the Bt. cotton growers. Adequate knowledge of recommended integrated pest management practices is essential to Bt. cotton growers for the success and profitable cultivation. It was therefore, thought necessary to obtain information from the Bt. cotton growers about the knowledge they possessed about integrated pest management practices of Bt. cotton crop. The mean score index was given in the [Table-3].

**Table-3** *Practice wise knowledge about integrated pest management among Bt. cotton growers* **(n=120)**

| Sr. No. | IPM Practices | Total maximum score | Total obtained Score | Obtained mean score index (per cent) | Rank |
|---------|---------------|---------------------|----------------------|--------------------------------------|------|
| **1.** | Seed treatment | 1920 | 1519 | 79.16 | II |
| **2.** | Boll worm control | 480 | 283 | 59.16 | V |
| **3.** | Sucking pest and its control | 4320 | 3672 | 85.00 | I |
| **4.** | Diseases and its control | 2040 | 1206 | 59.17 | IV |
| **5.** | Bio-pesticides | 480 | 139 | 29.16 | VIII |
| **6.** | Predators | 600 | 159 | 26.66 | IX |
| **7.** | Sticky trap | 480 | 116 | 24.16 | X |
| **8.** | Physiological disorder | 480 | 180 | 37.50 | VII |
| **9.** | Spraying equipments. | 600 | 414 | 69.16 | III |
| **10.** | Care and management in using pesticide | 960 | 480 | 50.00 | VI |

[Table-3] observed that the obtained mean score index of knowledge regarding sucking pest and its control and seed treatment for Bt. cotton crop were 85.00 and 79.16 and ranked first and second rank, respectively. The obtained mean score index of knowledge in relation to spraying equipments (69.16), disease and its control (59.17) and bollworm control (59.16) were ranked third, fourth and fifth. Moreover the practices viz., care and management while using pesticide (50.00),

physiological disorder (37.50), use of bio-pesticide (29.16), predators (26.66) and sticky trap (24.16) were ranked sixth to tenth,. It can be concluded that the knowledge mean score index regarding the plant protection measures viz., spraying equipments, disease and its control, bollworm control and care and management while, using pesticides were observed higher in comparison of practices viz., physiological disorder, use of bio-pesticide, predators and sticky

trap. The probable reason might be having sufficient education and medium extension participation and agriculture as main occupation of the respondents.

## Conclusion

It can be concluded that a large majority (80.00 per cent) of the respondents were found with medium to high level of knowledge about integrated pest management practices of Bt. cotton crop. Whereas, the knowledge refers to know-how about different integrated pest management practices of Bt. cotton crop possessed by the Bt. cotton growers it can be concluded that the knowledge mean score index regarding the plant protection measures *viz.,* sucking pest and its control, seed treatment, spraying equipments, disease and its control, bollworm control and care and management while, using pesticides were observed higher in comparison of practices *viz.,* physiological disorder, use of bio-pesticide, predators and sticky trap.

Further the attitude of Bt. cotton growers towards the use of pesticides in Bt. cotton crop.It can be concluded that a great majority (73.33 per cent) of the Bt. cotton growers had moderately favorable attitude towards the use of pesticides

**Conflict of Interest: None declared**

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