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Attitude of Farmers towards Bt-cotton Production Technology

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ABSTRACT

The present study was conducted in the native state Haryana. Out of 21 district, in the state, two districts namely Sirsa and Hisar has largest area and production under Bt-cotton among all the district of Haryana state and contributes about 50 per cent of Bt cotton production in the state. Cotton is soft, staple fiber that grows around the seeds of the cotton plants (*Gossypium* sp.), a shrub native to tropical and subtropical regions around the world, including the America, India and Africa. All the commercial cotton is Native American species (*Gossypium hirsutum* and *Gossypium barbadense*). The overall technology gap was found to be about 47.50 per cent. Aspect wise per cent, respectively). It was observed from the data that 49.17 high level of sowing methods of the respondents were found to be having high level of manures and fertilizer application 50.83 per cent. It was very much clear from the table that 54.58 per cent of the respondents had high level of technology gap in pest and disease management as for as picking of cotton was concerned, the most of the respondents 41.25 farmers belong to high technology gap When asked about their interest and needs for various training programme, almost all the farmers showed their interest in obtaining the training for the Bt-cotton growers farmers in different subject matter areas Insects scoutin, (88.75%) Application and use of chemicals (86.66%) features of Bt-cotton technology (83.75%), Bt-cotton varieties/hybrid (82.50%).

Key Words : Attitude, Bt-cotton, technology gap, farmers and fabrics

INTRODUCTION

Cotton is soft, staple fiber that grows around the seeds of the cotton plants (*Gossypium* sp.), a shrub native to tropical and subtropical regions around the world, including the America, India and Africa. All the commercial cotton is Native American species (*Gossypium hirsutum* and *Gossypium barbadense*). It is grown in temperate and tropical regions of more than 70 countries. Specific areas of production include India, China, USA, Pakistan, Uzbekistan, Egypt, Turkey, Australia, and Greece etc. Cotton popularly known as "White Gold" is a major fiber crop of the world and is used by about 75 per cent of world's population for textile purposes. Its fiber is used universally as a textile raw material. In India, it is important cash and commercial crop valued for its fiber and vegetable oil. It is a source for earning the valuable foreign exchange by providing employment to millions of people and hence plays a significant role in national economy. The diverse products obtained from cotton include textile raw material, cotton seed is a major source of vegetable oil and cotton cake as a rich source of high quality protein for livestock feed. Cotton is primarily grown as fiber crop. It is harvested as 'seed cotton', which is then 'ginned' to separate the seed and lint. The long 'lint' fibers are further processed by spinning to produce yarn that is knitted or woven into fabrics.

Committee (GEAC) and resulted into drastic reduction in cultivation of conventional cotton. There was an exponential increase in Bt- cotton area accounting for a staggering 92 per cent of the total cotton area in India. The production increased 31.20 million bales during 2010- 11 (Anonymous, 2014). Cotton is important in India, Bt- cotton was released in the year 2002 by Genetic Engineering Approval important cash crop in India. About 15 million farmers in the country spread across 10 states engaged in cotton cultivation over 10 million hectares

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area. India ranks third in global cotton production after USA and China. India accounts for approximately 25.00 per cent of world's total cotton area and 16 percent of global cotton production. Per hectare yield of cotton in India is recorded as 300 kg per hectare against world average of 580 kg per hectare. Pest and diseases attack, limited irrigation, vulnerability of monsoon, application of quality inputs are affecting yield significantly. Cotton is a major fiber crop and used for textile purpose by large section world's population. Cotton crop has a pivotal role in the Indian economy due to its direct and indirect employment and income generation in the agricultural and industrial sector. In Haryana, cotton is grown during *Kharif* season. Cotton accounts for an area of 610 thousand ha in Haryana with total production of 24,000 thousand bales and yield of lint is 664.50 kg/ha (Statistical Abstract of Haryana, 2013-14). Cotton is attacked by several insect pests reducing the crop yield largely. The insect pests that attack cotton crop may be classified into sap sucking insects (Aphids, Jassids and White fly) or chewing insects (Bollworms, leaf eating caterpillars etc.). Of the total pesticides used in Indian Agriculture, about 45 per cent is sprayed on cotton crop alone. To reduce pesticide usage in cotton, several strategies like use of Genetic Resistance to insect pests, Integrated Pest Management (IPM), Insecticide Resistance Management (IRM) etc. are advocated. In recent times, *Bt* cotton technology is found to be one of the best strategies to manage bollworms, the most important pest of cotton.

METHODOLOGY

The study was conducted in native state Haryana. Out of 21 districts in the state, two districts namely Sirsa and Hisar has largest area and production under Bt- cotton among all the districts of Haryana State. Multistage sampling technique was used for the selection of district, block, village and respondents. Two blocks from each district were selected randomly. There were Hisar-II, Hansi-I, Sirsa, and Nathusari Choupta. Four blocks were prepared and four villages from each block were again selected randomly. Total sample of 240 farmers in the 16 villages were selected randomly. To gather the background information of the farmers (respondents) self-developed interview schedule was used and data gathered were tabulated and computed for frequency distribution and percentages.

RESULTS AND DISCUSSION

Attitude of farmers towards Bt- cotton production technology

The respondents were classified into three different categories, namely: Most Favorable, Favorable, and Unfavorable based on their attitude score. The data have been presented in Table 1.

Table 1 : Overall attitude of farmers about *Bt*-cotton production technology (n=240)

Sr. No.	Category	Score Range	Frequency	Percentage
1.	Most favorable	Less than 46	152	63.33
2.	Favorable	46-90	52	21.67
3.	Unfavorable	More than 90	36	15.00

Table 2 : Aspect wise attitude of farmers about *Bt*-cotton production technology (n=240)

Sr. No.	Attitude	Category	Score Range	Frequency	Percentage
1.	Environment	Most favorable	Less than 9	104	43.33
		Favorable	9-16	87	36.25
		Unfavorable	More than 16	49	20.42
2.	Economic	Most favorable	Less than 9	102	42.50
		Favorable	9-16	91	37.92
		Unfavorable	More than 16	47	19.58
3.	Social	Most favorable	Less than 14	92	38.33
		Favorable	14-26	81	33.75
		Unfavorable	More than 26	67	29.92
4.	Technological	Most favorable	Less than 16	108	45.00
		Favorable	16-30	99	41.25
		Unfavorable	More than 30	33	30.75

The data reveals that about a slight less than two-third (152) of the respondents had Most Favorable attitude while (52) respondents had favorable of them had Favorable attitude and remaining 36 of them possessed Unfavorable attitude.

The Bt-cotton production technology was divided into four aspects *viz*., environmental, economic, social and technology, respectively. To obtain the attitude of respondents about Bt-cotton production technology all aspect were given a particular score based on the recommended practices. The maximum attitude score were given as environmental (25), economic (25), social (40), and technology (45). Rafee *et al*. (2003) found the average knowledge level of the farmers was 82.25 per cent. Approximately 43.57 per cent of the farmers obtained their knowledge from cotton farmers' field schools, 9.46 per cent of the farmers got their knowledge from farmer field school and other sources, and 29.22 per cent of the farmers obtained their knowledge to other sources. They recorded that educational level and land holdings of the respondents had significant correlation with cultivation and servicing of cotton yield. They also found the three independent variables were found to have significant correlation with farmers' field schools, including farmer's educational level, attitude toward innovation, and degree of mental flexibility.

Technological aspect-wise distribution of farmers based on their attitude about Bt-cotton production:

According to the Table 2 attitude of the practices such as environment the (43.33 %) of the respondent were had Unfavorable attitude followed by (36.25 %) of them were had favorable attitude and one-fifth (20.42 %) of the respondents falls under most favorable attitude .Incase of economic, the majority (42.50 %) of the respondents falls in the category of Unfavorable attitude followed by favorable (37.92 %) and most favorable (19.58 %) of the respondents in economic.

Table 3 : Correlation coefficient of Bt-cotton grower's socio-economic variable with their attitude about Bt-cotton production technology

Sr. No.	Socio-economic variables	Correlation coefficient 'r' value
1.	Age	0.091
2.	Education	0.170*
3.	Socio-economic status	0.366**
4.	Land Holding	0.182*
5.	Irrigation facilities	0.139
6.	Change provenance	0.115
7.	Mass media	0.111
8.	Risk orientation	0.125
9.	Extension contact	0.153*

*Significance at 5 % level of Probability
**Significance at 1 % level of Probability

Aspect wise attitude of farmers about *Bt*-cotton production technology:

As far as social aspect of Bt-cotton production technology is concerned a slight less than two-fifth (38.33 %) of the respondents had unfavorable attitude, followed by (33.75 %) who had favorable attitude and remaining 29.92 per cent of the respondents falls under most favorable attitude category.

In case of technological aspects of Bt-cotton production technology a good majority (45.00 %) of them had unfavorable attitude followed by those of (41.25 %) and (13.75 %) respondents having favorable and most favorable attitude.

It can be concluded that the overall attitude of the respondents of all the practices/aspects of Bt-cotton production technology is concerned, about 42.00 percent of the respondents had positive attitude. Vermeulen *et al*. (2005) studied the consumers' (n=90) knowledge of, attitudes toward, and acceptance of genetically modified (GM) maize in urban South African. They recorded four distinct clusters/market segments with specific characteristics: "anti-GM, brand aware" cluster (35 % of valid responses), "brand unaware, farmer sympathetic" cluster (20 %), "GM consumer benefit, brand aware" cluster (25 %) and the "brand aware, pro-GM" cluster (20 %). They also found the significant differences between the clusters based on the consumers' attitudes towards GM food products.

Association between socio-economic traits and attitude level of Bt-cotton growers:

The data given in the Table 3 showed that the economic status 0.366 was found highly significant and positively associated with farmers onwards the Bt-cotton production technology, land-holding 0.182 and extension contact education 0.170 were found significantly and positively associated towards the Bt-cotton production technology. It means that these variables have contributed to production of Bt-cotton attitude of farmers.

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