Correlation of adoption of Bt cotton production technology

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ABSTRACT

The study was conducted in Nanded district of Maharashtra state to know the profile of Bt cotton growers and to find out relationship of characteristics of Bt cotton growers with adoption of Bt cotton production technology. From the study it was found that majority of the Bt cotton growers had 12 to 26 years of farm experience, educated up to Middle School, medium land holding, medium level of annual income, medium sources of information use, medium level of social participation, medium risk preference and middle socio-economic status. Education, land holding, annual income, sources of information use, social participation, risk preference and socio-economic status were positively and significantly related with the adoption of Bt cotton production technology. While, education, land holding, annual income and risk preference had substantial contribution to the adoption of Bt cotton production technology.

INTRODUCTION

Cotton (*Gossypium* sp.) is said to be the king of cultivated crops being a main cash crop. Cotton is also known as 'White gold'. Cotton fulfills the need of clothing of human being. It is an important source of fibre and oil. Cotton seeds and seed cakes are important sources of concentrates to animals. Cotton is also used in manufacture of synthetic rubber, soaps, cosmetics, plastic, papers, explosive etc. Cotton is the prime source of natural fibre which is raw material of textile industry.

India ranks third in global cotton production after USA and China but per hectare yield of cotton in India is lowest with 300 kg per hectare against world average of 580 kg per hectare. Pest and disease attack is one of the most important factors affecting yield levels significantly. The loss due to it is to the tune of 13 to 15 per cent which is a serious concern. The bollworm complex causes significant yield losses, further, the harmful effects of insecticides leading to environmental pollution and more specifically increasing the cost of cultivation. In this context the application of biotechnology was seen as a solution and thus the efforts have resulted in developing of Bt cotton. Bt is a genetically engineered crop hence is referred transgenic cotton. This Bt cotton contains a toxic protein inducing gene from soil bore bacterium *Bacillus thuringiensis*, thus enabling the crop to produce toxin resulting in decrease bollworms infestation, reduced application of insecticides,

increase the productivity, quality of fibre and provide safety to the farmers. An attempt was made in present to know the profile of Bt cotton growers and to find out relationship between characteristics of Bt cotton growers and adoption of Bt cotton production technology.

METHODOLOGY

Present study was conducted in Kinwat and Bhokar talukas of Nanded district of Maharashtra State as these talukas had highest area under Bt cotton. Twelve Bt cotton growers from five villages of each taluka were selected randomly. Thus, sample size comprised 120 respondents. The selected Bt cotton growers were interviewed personally at their home or at their farm as per their convenience. The data were collected with the help of structured schedule and anlalysed by using mean, standard deviation, frequency, percentage, correlation and regression analysis.

RESULTS AND DISCUSSION

The findings of the present study as well as relevant discussion have been summarized under following heads:

Farm experience:
Table 1 revealed that majority of the Bt cotton growers (65 per cent) were had 12 to 26 years of farm experience followed by up to 11 years of farm experience (20.83 per cent) and 27 years and above farm experience (14.17 per cent).

Table 1: Profile of Bt cotton growers		(n=120)		
Sr. No	Characteristic	Category	Frequency	Per cent
1.	Farm experience	Up to 11 years	25	20.83
		11.1 to 26 years	78	65.00
		More than 26 years	17	14.17
2.	Education	Illiterate	08	06.67
		Literate	10	08.33
		Primary School	18	15.00
		Middle School	52	43.33
		High School	32	26.67
		College level	00	00.00
3.	Land holding	Marginal farmers (upto 1ha)	06	05.00
		Small farmers (1.1 to 3 ha)	17	14.17
		Medium farmers (4.1 to 10 ha)	78	65.00
		Large farmers 10.1 ha and above)	19	15.83
4.	Annual income	Low annual income (upto Rs. 1,01,144)	18	15.00
		Medium annual income (Rs. 1,01,145 to 1,99,722)	91	75.83
		High annual income (Rs. 1,99,723 and above)	11	09.17
5.	Sources of information use	Low (upto 15)	16	13.33
		Medium (16 to 22)	90	75.00
		High (23 and above)	14	11.67
6.	Social participation	Low	49	40.83
		Medium	65	54.17
		High	06	05.00
7.	Risk preference	Low (upto 14)	28	23.33
		Medium (15 to 19)	88	73.33
		High (20 and above)	04	03.33
8.	Socio-economic status	Upper social-economic status	06	05.00
		Upper middle social-economic status	19	15.83
		Middle social-economic status	84	70.00
		Lower middle social-economic status	11	09.17
		Lower social-economic status	00	00.00

Education:

It is clear that 43.33 per cent of the Bt cotton growers were educated up to Middle School level, 26.67 per cent of the Bt cotton growers were educated up to High School, 15.00 per cent of the Bt cotton growers were educated up to Primary School, 8.33 per cent of Bt cotton growers were literate (could read and write), 6.67 per cent were illiterate and no any respondent was having College level education (Table 1).

Land holding:

It was observed that 65 per cent of the Bt cotton growers belonged to medium farmer category followed by large farmers (15.83 per cent), small farmers (14.17

per cent) and marginal farmers only 5 per cent (Table 1).

Annual income:

It is visible that substantial number (75.83 per cent) of the Bt cotton growers had medium level of annual income followed by 15.00 per cent and 9.17 per cent of the Bt cotton growers had low and high level of annual income, respectively (Table 1).

Sources of information use:

It was noticed that significant percentage of the Bt cotton growers (75.00 per cent) had medium sources of information used followed by 13.33 per cent of Bt cotton growers with low sources of information use and 11.67

Agric. Update | Aug. & Nov., 2010 | Vol. 5 | Issue 3 & 4 |

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per cent had high sources of information use (Table 1).

Social participation:

It was noticed that majority of the Bt cotton growers (54.17 per cent) had medium level of social participation followed by low level of social participation (40.83 per cent) while only 5 per cent of the Bt cotton growers had high level of social participation (Table 1).

Risk preference:

It was noticed that considerable portion of Bt cotton growers (73.33 per cent) had medium risk preference followed by 23.33 per cent of Bt cotton growers had low risk preference and only 3.33 per cent of the Bt cotton growers had high level of risk preference (Table 1).

Socio-economic status:

It was revealed that most of the Bt cotton growers (70.00 per cent) belonged to middle socio-economic status followed by 15.83 per cent had upper middle socio-economic status, 9.17 per cent of Bt cotton growers were from lower middle socio-economic status, 5 per cent of Bt cotton growers were from upper socio-economic status and no any respondent was in lower socio-economic status category (Table 1).

Relational analysis:

Correlation coefficient:

It is evident from Table 2 that independent variables like education, land holding, annual income, sources of information use, social participation, risk preference and socio-economic status were positively and significantly related with the adoption of Bt cotton production technology. These findings are in line with that of Kalaskar (1998) and Bandgar (2003).

Multiple regression:

From Table 3 it is indicated that selected independent

Table 2 : Relationship between the profile of Bt cotton growers and adoption of Bt cotton technology

Sr. No.	Category	Correlation coefficient 'r' value
1.	Farm experience	-0.098
2.	Education	0.518**
3.	Land holding	0.374**
4.	Annual income	0.634**
5.	Sources of information use	0.650**
6.	Social participation	0.317**
7.	Risk preference	0.548**
8.	Socio-economic status	0.326**

** indicates significance of value at P=0.01

Table 3 : Multiple regression analysis of independent variables with adoption of Bt cotton technology

Sr. No.	Category	Regression coefficient	
		'Bi' value	't' value
1.	Farm experience	-0.0275	-1.2604
2.	Education	0.7143	3.72127**
3.	Land holding	0.1689	3.76120**
4.	Annual income	0.0257	5.10150**
5.	Sources of information use	0.0794	1.08638
6.	Social participation	-0.4386	-2.4959
7.	Risk preference	0.2740	3.8657**
8.	Socio-economic status	-0.000261	-0.0042

**indicates significance of value at P=0.01

R^2 = 0.678

F = 29.1836

variables have explained variation in cotton technology of Bt cotton growers to the extent of 67.80 per cent. The coefficient of determination (R^2) was 0.678. The unexplained variation may be attributed to the variables, which were not included in the study.

From the regression analysis, it is seen that out of eight independent variables, education, land holding, annual income and risk preference had substantial contribution to the adoption of Bt cotton production technology. The calculated 't' value of these variables was positively significant at 0.05 level of probability. These findings are supported by Sawant (2006) and Athawale (2008).

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