



Research Article

## Extent of knowledge level of farmers regarding Bt cotton production technology

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**SUMMARY :** Introduction of Bt cotton has reduced the usage of pesticides and increased the profit of the Bt cotton farmers. Present study was conducted to know the knowledge level of farmers about recommended Bt cotton production practices in the year 2010-2011. The three taluks viz., Raichur, Manvi and Deodurg of Raichur district were selected based on highest area of Bt cotton under irrigated condition and again four villages were selected from each taluk based on highest area under Bt cotton. From each village 10 farmers under irrigation condition were selected randomly and the total sample size constituted of 120 for the study. The study revealed that, half of the respondents belonged to medium level of knowledge category about improved cultivation practices of Bt cotton. Cent per cent of the respondents had knowledge about sowing method and ninety per cent of respondent had knowledge about sowing time. More than half of the respondents (54.17%) had correct knowledge about quantity of FYM to be applied and 45.83 per cent of respondents were aware of proper time for application of FYM. The variables education and land holding had positive and significant relationship at 0.05 level of significance.

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Knowledge level, Bt cotton, Production technology

### BACKGROUND AND OBJECTIVES

Cotton, the 'White Gold' and 'King of Fibres' is a crop of prosperity and is considered to be an industrial commodity of worldwide importance. Cotton occupies a predominant place among cash crops touching the country's economy at several points by generating direct and indirect employment in the agricultural and industrial sectors. Cotton industries provide means of livelihood for about 250 million people through its cultivation, trade and industries in India. In cotton, bollworm causes significant yield loss. Sources of resistance to the bollworm in the germplasm of cotton the world over are not available. Moreover, about 10 per cent of insecticides on global basis and forty five per cent in India are used for control of insects in cotton crop alone. Insecticides have adverse effects on natural predators and parasites of bollworms, beneficial insects, human health and microorganisms such as earthworm, blue green algae, nitrogen fixing bacteria, etc. Researches on

the biotechnological approaches have offered an alternative to this in the form of Bt cotton.

In Karnataka, Bt cotton occupies an area of 4.16 lakh ha with a production of 4.85 m tonnes (Anonymous, 2010). Raichur is one of the potential Bt cotton growing district with an area of 29,388 hectares (Anonymous, 2010). In the past, numbers of studies have examined the significant technological, economic and environmental benefits derived from growing Bt cotton across the globe including India. However, the studies conducted on farmers' knowledge level of Bt cotton are less. Though a number of improved production technologies are recommended by the researchers and extension workers to obtain maximum profit, measuring the farmer's knowledge level of Bt cotton are important to help them to realize the complete yield of the crop. Hence, the study was conducted with the following objectives to know the Knowledge level of farmers about improved Bt cotton recommended

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production practices and to study the socio-economic relationship between dependent and independent variables.

## RESOURCES AND METHODS

The study was conducted in 2011 in Raichur, Manvi and Deodurg taluks of Raichur district, Karnataka state. Based on highest area under Bt cotton cultivation. Four villages were selected from each taluk. From each village 10 farmers under irrigation condition were selected by random sampling procedure to constitute a sample size of 120 for the study. Data were collected by the personal interview method using structured interview schedule. The ex-post facto research design was used for the study. Appropriate statistical tools used for analysis and interpretation of data.

## OBSERVATIONS AND ANALYSIS

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

### Overall knowledge of farmers about recommended production practices of Bt cotton:

A perusal of Table 1 reveals that, majority of respondents belong to medium and high knowledge level category (50.83% and 25.00%, respectively) with a mean knowledge score of 15.33. Majority of the respondents studied up to high school and when analysis of mass media was made, majority of respondents possessed television sets. Further, the study also revealed that most of respondents participated in extension activities like demonstrations and field visits, krishimela. These factors might have contributed more for possession of medium level of knowledge of Bt Cotton cultivation practices. The above findings are in confirmation of the results of the studies conducted by the Maraddi and Verma (2003) and Sidram (2008).

**Table 1 : Overall knowledge level of the Bt cotton growers about improved cultivation practices of Bt cotton (n= 120)**

Category	Frequency	Percentage
Low (mean - 0.425*SD)	29	24.17
Medium (mean $\pm$ 0.425*SD)	61	50.83
High (mean + 0.425*SD)	30	25.00
Mean=15.33	SD=2.69	

### Extent of knowledge of recommended production practices of Bt cotton:

An appraisal of Table 2 revealed that all the respondents had knowledge about the improved hybrids best suited to their region as every individual tries to acquire knowledge about improved varieties or hybrids to get assured yield. Majority of the respondents (90.83%) had correct knowledge of sowing time, cent per cent of respondent had correct knowledge of sowing method and recommended seed rate

was known to 80.83 per cent of the respondents. Regarding suitable soil type nearly ninety per cent of the respondents had correct knowledge of deep black cotton soil which is best suitable for cultivation of Bt Cotton. About sixty four per cent of respondents had knowledge of duration of the crops and recommended spacing was known to 87.50 per cent of the respondents. These practices are important aspects of cultivation of any crop and do not vary much with other crops' cultivation practices. Therefore, more than half of the respondents found to have better knowledge about these basic practices.

Regarding quantity of FYM to be applied, 54.17 per cent of the respondents had correct knowledge and most of them (45.83%) expressed correct time for application of FYM is 2-3 weeks before sowing. This enables the FYM to gradually penetrate and mix with the soil for congenial soil texture for sowing and germination. Further the result also revealed that majority of the respondents had incorrect knowledge about recommended doses of chemical fertilizers, pests, diseases and their control measures. Recommended doses of chemicals differ for different crops. As the region comes under north eastern dry agro climatic zone of Karnataka, farmers of the region take up many crops. Due to various dosages for many crops, farmers would not have remembered the exact dosage of chemicals. The complexity involved in this could have resulted in majority having incorrect knowledge of chemical fertilizers. Another reason could be, the farmers noticed low incidence of disease and pests in Bt cotton as compared to non Bt cotton that might have resulted in poor knowledge about pests and disease and their control measures.

The data in Table 3 indicated that, 25.00 per cent of respondents were educated up to high school followed by middle school (20.83%), primary (18.33%), pre-university (17.50%), illiterates (15.00%) and educated up to degree and above (3.34%). The results could be attributed to the availability of free basic education and the educational infrastructure in the study area. Few of them opted higher education reflecting on their affordability and interest to learn more and gain good knowledge. It is observed that 47.50 and 40.83 per cent of the respondents had the farming experience of 9 to 16 years and more than 17 years, respectively. It was also observed that 45.83 per cent of respondents belonged to big land holders category followed by medium (26.67%), small (21.67%) and marginal (5.83 %) land holding category. The study area greatly has the plain land and in such lands large holdings are common unlike in hilly and coastal zones. The economic position of the farmers in the Table 3 revealed that 47.50 per cent of the respondents belonged to high annual income level followed by medium (25.83%), semi medium (20.84%) and low (5.83%) annual income category. The possible reason for high annual income of the respondents it could be contributed to their land holding, cropping pattern

**Table 2 : Knowledge level of the Bt cotton growers about individual Bt cotton cultivation practices (n=120)**

Sr. No.	Practices	Knowledge level	
		Frequency	Percentage
1.	Selection of seeds		
	Bunny	65	54.17
	Mallika	98	81.67
	Vikram-5	45	37.50
	Dr-Brent	33	27.50
2.	Suitable soil type (Deep black cotton soil)	105	87.50
3.	Crop duration	77	64.17
4.	Sowing		
	Time (May to July 15)	109	90.83
	Method (Manual dibbling)	120	100.00
	Seed rate (2.5 - 3 kg/ha)	97	80.83
5.	Spacing (90 x 60 cm)	105	87.50
6.	FYM application		
	Quantity (10 tones)	65	54.17
	Time of application (2-3 weeks before sowing)	55	45.83
7.	Chemical fertilizer NPK (150:75:75) kg/ha	57	47.50
	Top dressing (30DAS)	45	37.50
8.	Use of green manure (sunhemp)	8	6.67
9.	Use of bio-fertilizer ( <i>Azospirillum</i> )	6	5.00
10.	Physiological Disorder		
	Flower drop (Planofix @ 0.25ml/l)	52	43.33
	Leaf reddening (1% MgSO <sub>4</sub> )	76	63.33
11.	Intercultivation (2-3 times)	86	71.67
12.	Herbicide application (Pendimethalin 30EC, )	37	30.83
13.	Major pests		
	Leaf hopper	87	72.50
	Thrips	55	45.83
	Mirid Bug	52	43.33
14.	Major diseases		
	Leaf spot	58	48.33
	Cotton rust	45	37.50
15.	Intercropping		
	Chilli	72	60.00
	Cowpea	46	38.33
	Pigeonpea	38	31.67
16.	Trap crop cultivation		
	Non Bt	84	70.00
	Bhendi	65	54.17
	Tomato	55	45.83
17.	Pheromone trap (4-5/ha)	11	9.17
18.	Yield (25-30 q/ ha)	76	63.33

Note: The information in the parenthesis is as per the recommended package of practices

**Table 3 : Distribution of respondents according to their personal characteristics of Bt cotton growers (n=120)**

Category	Frequency	Percentage
<b>Education level</b>		
Illiterate	18	15.00
Primary	22	18.33
Middle school	25	20.83
High school	30	25.00
Pre-university	21	17.50
Degree and above	4	3.34
<b>Farming experience</b>		
Low (up to 8 years)	14	11.67
Medium (9-16 years)	57	47.50
High (17 and above)	49	40.83
<b>Land holding</b>		
Marginal farmers (up to 1 ha)	7	5.83
Small farmers (1 to 2 ha)	26	21.67
Medium farmers (2 to 4 ha)	32	26.67
Big farmers (>4 ha)	55	45.83
<b>Annual income</b>		
Low (Up to Rs 17,000)	7	5.83
Semi medium (Rs 17,000-Rs 34,000)	25	20.84
Medium (Rs 34,000- Rs 51,000)	31	25.83
High (Above Rs 51,000)	57	47.50
Maximum annual income	450000 Rs	
Minimum annual income	10000 Rs	

and subsidiary occupation.

#### **Relationship between selected independent variables with their knowledge level:**

The perusal of the Table 4 reveals that, the results indicated positive and significant relationship of education with the knowledge level of recommended practices in Bt cotton crop. The probable reason might be that the recommended practices being complex in nature could be understood better by persons having higher education. Positive and significant relationship of farming experience with the knowledge level of the respondents. Farmers having greater farming experience (more number of years), know better about cultivation practices. The variable, size of land holding of the respondents had negative and non significant relationship with knowledge level. This may be due to the fact

that farmers with higher size of land holding may not fully involved themselves in understanding about recommended practices of Bt cotton. The results revealed that annual income exhibited negative and non significant relationship with knowledge level about recommended practices in Bt cotton crop. The possible reason might be that persons irrespective of their income eager to acquire knowledge through extension contacts and participation in extension activities as well as through their easy access to mass media and had more risk taking ability.

#### **Conclusion:**

It can be concluded from above findings that, more than half of the respondents belonged to medium level of knowledge regarding improved cultivation practices of Bt cotton. It is logical to derive from the above discussion that the practices which are complex and difficult to remember are moderately known to farmers. On the other hand, the practices which are simple and traditionally practiced were known to majority of farmers. This indicates a vast scope for the developmental departments to intervene and improve the knowledge level of farmers about improved cultivation practices of Bt cotton. The study thus indicated that though the Bt cotton is cultivated by many farmers, their scientific knowledge about

**Table 4 : Relationship of independent variables with knowledge**

Independent variables	Knowledge 'r'
Education	0.3185**
Farming experience	0.2167*
Land holding	0.0575NS
Annual income	0.0883NS

NS=Non-significant

the crop and scientific adoption have the gaps. One of the best ways to overcome this is to vigorously utilize the scientific expertise of Krishi Vigyan Kendras for conducting regular off campus training for the farmers. Conducting farmer's field schools would certainly helps to bridge these gaps.

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