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To assess the extent of adoption of BT cotton production practices in Shahapur Taluk of Yadgir district (Karnataka)

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Abstract

A sample survey study was on Adoption behavior of Bt cotton (*Bacillus thuringiensis*) growers in Shahapur taluk of Yadgir district (Karnataka) covering 1 taluk of 10 respondents purposively selected villages with 120 randomly selected sample growers in order to evaluate Adoption behavior of Bt cotton growers and the related correlates sufficient previous researchers were reviewed to select the critical variables for developing the theoretical concept and deriving the hypothesis. The data were collected to observation, informal discussion and formal interview techniques with the help of predesigned tested instrument for recording the relevant information. The data thus, collected were processed, analyzed, interpreted in the light of objectives set forth with the application of suitable statistical test. It was found that majority (61.67%) of respondents belonged to medium adoption category, followed by 31.67 and 15.83 percent of the respondents belonged to high and low adoption categories, respectively. The mean adoption score of the respondents was 24.63.

Keywords: adoption of BT cotton, Shahapur Taluk, Karnataka

Introduction

India is the largest cotton growing country in the world and the cotton crop occupies nearly 9% of the annual cropped area of the country and plays a significant role in the Indian economy.

Cotton (*Gossypium species*) is also known as 'White Gold' and 'King of Fiber's dominates India's cash crop, and makes up 65% of the raw material requirements of the Indian textile industry. In the 13th century, the Mongol-Tartar dynasty brought cotton to china from India. Today, china is the largest producer in the world and India is the second largest producer country in the world. India has the largest acreage (9.4 m/ha) under cotton at global level and has the productivity of 560 kg Lint /ha and ranks second in production after China. Cotton is a crop of prosperity and is considered to be an industrial commodity of worldwide importance. It is an important fiber crop of global significance, cultivated in tropical and sub-tropical regions of around eighty countries, which accounts for 45 percent of world fiber. The major producers of cotton are China, USA, India, Pakistan, Uzbekistan, Argentina, Australia, Greece, Brazil, Mexico and Turkey. These countries contribute about 85% to the global cotton production.

In India 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 occupies a place of pride being the prime supplier of raw material (85%) for textile industry, which is one of the leading industries in the country. Cotton industries provide means of livelihood for about 250 million people through its cultivation, trade and industries in India. Commercially cotton is one of the best export earning commodities in the country. Textiles and related exports of which cotton constitutes nearly 65 percent, accounts for nearly 33% of the total foreign exchange earnings of our country. Cotton is cultivated in three distinct agro-ecological regions (north, central and south) of the country. The northern zone is almost irrigated, while the percentage of irrigated area is much lower in the central and southern zones.

In Northern zone comprising Punjab, Haryana and parts of Rajasthan and Uttar Pradesh, cotton is grown under irrigated conditions on alluvial and sandy soils. The region is known for growing "*Hirsutum-arboreum*" type of cottons. After the introduction of Bt cotton, *Intra-hirsutum* Bt cottons are being extensively cultivated. This zone has the productivity of 558 kg lint/ha. Cotton in this area is grown by adopting farm mechanization.

Central zone comprises primarily rain fed tract of Madhya Pradesh, Maharashtra and Gujarat. Predominant area is under black soil, which is subjected to runoff, erosion, soil and nutrient losses. Soils are poor in fertility.

Cotton productivity is the lowest (510 kg lint per hectare) due to uncertainty and vagaries of monsoon this area is known as Central *Hirsutum-arboreum-herbaceum* and hybrid zone.

Southern zone comprising of Andhra Pradesh, Karnataka and Tamil Nadu is a zone for growing *Hirsutum-arboreum-herbaceum-barbadense* and hybrid cottons. Soils of this zone are both black and red and poor in fertility. Cotton cultivation is done both under irrigated and rain fed conditions. This zone has the productivity of 599 kg lint/ha. The area is well known for growing long and extra-long staple H×B hybrid and *barbadense* cottons. The south zone is occupying 15.3% of area and contributing nearly 16.3% in national production.

In cotton, bollworms cause significant yield losses. Three types of bollworms, viz. American bollworm (*Helicoverpa armigera*), pink bollworm (*Pectinophora gossypiella*) and spotted bollworms (*Earias vitella*) attack the crop. Sources of resistance to the bollworms in the germplasm of cotton, the world over are not available. Moreover, about 10% of insecticides on global basis and 45% 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 and nitrogen fixing bacteria. Use of insecticides also leads to environmental pollution (soil and water), increase in cost of cultivation and sometimes development of resistance in insects against insecticides. Hence, there is need to develop bollworm resistant cotton to control yield losses due to bollworms.

Methodology

The research study on Adoption level of respondents about Bt cotton production practices was conducted during the year 2017-2018 in Shahapur taluk of Yadgir district (Karnataka). In the present investigation, descriptive type of ex-post-facto research design was employed. This design was appropriate because the phenomenon had already occurred. Ex-post-facto research is the most systematic empirical enquiry in which the researcher does not have any control over independent variables as their manifestation has already occurred or as they are inherent and not manipulatable thus, inferences about relations among variables were made without direct intervention from concomitant variation of independent and dependent variables. (Kerlinger, 1973). Yadgir district comprises of three Taluks namely, shahapur, yadgir and shorapur. The shahapur taluk is purposively selected, because highest area under BT cotton crop. In shahapur ten villages were selected namely, Doranahalli, Gogi, Sagar, Vanadurga, Rabanalli, Hothpet, Hulkal, Mudabol, Madriki, Gawar from each village 12 samples were drawn randomly such that the total sample size was 120.

Adoption was operationally defined, as the extent to which Bt cotton production techniques was knew by the

respondents. For the present study an operational measure for adoption was developed by constructing a “teacher made knowledge test”. The adoption test was constructed based on the package of practices developed for Bt cotton cultivation. Lists of 19 cultivation practices were developed for the purpose and each practice was administered in the form of questions to respondents to obtain the response from Bt cotton growers. The questions were provided with multiple choice answers. The questions and answers pertaining to adoption test were carefully designed in consultation with experts. The questions covered full range of cultivation practices beginning from variety selected till the crop yield. Frequency percentage calculated each statement.

Results and Discussion

To assess the extent of adoption of BT cotton production practices.

The data presented in (Table: 1) indicated that, the extent of adoption of recommended cultivation practices of Bt cotton by the respondents is given in Table 2. The data revealed that, 71.67 percent of the respondents adopted sowing time i.e, they have sown Bt cotton during the month of June to July. With regard to adoption of recent varieties viz, Ajit and Jadoo, 61.67 percent fully adopted. The practices like recommended seed rate had fully adopted by majority (51.67%). The seed treatment with *Rhizobium* and also the use of correct dosage for seed treatment was not adopted by 50.00 percent of respondents. and spacing (62.50%) were adopted. However,

The 86.67 percent of respondents adopted irrigation. With regard to fertilizer management, majority (70.00%) of the respondents have fully adopted recommended quantity of FYM. However, 18.33 percent of them have partially adopted FYM. The similar trend followed in case of time of application of FYM. (63.33%) of respondents followed by intercropping practice (68.33%). With regard to application of NPK fertilizer, 56.67 percent of the respondents adopted.

With respect to insect pest and disease management, majority 52.50 percent of respondents fully adopted the pest and disease control followed by (13.33%) of respondents followed it partially adopted for the pest and disease. (34.17%) of respondents not adopted.

With regard to weed management and intercultural operations, 57.50 percent of respondents had adopted intercultivation i.e., two times within 40 days. With regard to hand weeding, 75.00 percent of respondents carried weeding during crop period.

With regard 76.67 of the respondents know the number of picking taken. Majority of (68.33%) the respondents adopted harvesting time. 83.33 percent of the respondents yield obtained per hectare. 88.33 percent of the respondents know the net profit obtained per hectare.

Table 1: Extent of adoption of improved individual cultivation practices of BT cotton crop by the respondents.

S. No.	Practices	Fully adopted		Partial adopted		Not adopted	
		F	%	F	%	F	%
1.	Sowing time (June to July)	86	71.67	32	26.67	2	1.67
2.	Varieties (Ajit)	74	61.67	25	20.83	21	17.50
3.	Which hybrid was sown (Jadoo)	76	63.33	38	31.67	6	5.00
4.	What was the seed rate / ha used (2.5-3 kg/ha)	62	51.67	36	30.00	22	18.33
5.	Seed treatment (Rhizobium)	60	50.00	34	28.33	26	21.67
6.	Spacing adopted	75	62.50	30	25.00	15	12.50
7.	Between row to row (90 cm)	70	58.33	36	30.00	14	11.67
8.	Between plant to plant(60 cm)	70	58.33	35	29.17	15	12.50

9.	Number of irrigation given (3-4)	104	86.67	12	10.00	4	3.33
10.	FYM applied Time: 2-3 weeks before Quantity: t/ha	84	70.00	22	18.33	14	11.67
11.	Did you follow the intercropping practice: (Yes)	76	63.33	26	21.67	20	16.67
12.	Quantity of NPK used 80:40:40 kg /ha	68	56.67	30	25.00	22	18.33
13.	Plant protection measures a) Disease control b) Pest control	63	52.50	16	13.33	41	34.17
14.	Which method was adopted by you for the control of weeds: (Hand weeding)	90	75.00	20	16.67	10	8.33
15.	Number of pickings taken? (3 picking)	92	76.67	16	13.33	12	10.00
16.	Harvesting time (Jan-Feb)	82	68.33	23	19.17	15	12.50
17.	What was the yield obtained per ha? (45qt/ha)	100	83.33	14	11.67	6	5.00
18.	What is the net profit obtained 3.1-6 lakh/acre	106	88.33	10	8.33	4	3.33

Overall adoption level of the respondents about BT cotton production practices.

The data presented in (Table: 2) indicated that, 61.67 percent of respondents belonged to medium adoption category, followed by 31.67 and 15.83 percent of the respondents belonged to high and low adoption categories, respectively. The mean adoption score of the respondents was 24.63.

Table 2: Overall adoption level of the BT cotton production practices.

S. No	Adoption	Frequency	Percentage
1	Low (mean-0.425*SD) < 15.36	19	15.83
2	Medium (mean±0.425*SD) 33.9115.36	74	61.67
3	High (mean+0.425*SD) >33.91	38	31.67
Total		120	100

(n=120) Mean=24.63 SD=9.28

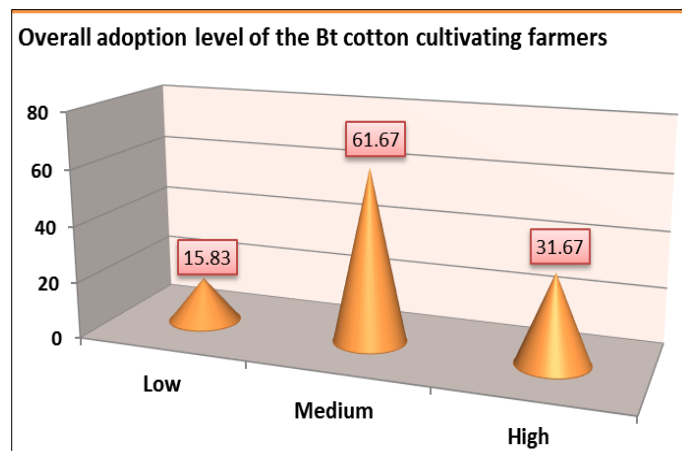


Fig 2: Overall adoption level of the respondents

Conclusion

It is concluded that majority of the respondents were middle age group having education up to high level and having medium level of farming experience, mass media exposure, innovativeness, achievement motivation, risk orientation, decision making ability and information seeking ability. It was found that majority of them had medium level of knowledge and adoption regarding BT cotton production practices. The major constraints reported by the respondents were difficulty in controlling pests and diseases, lack of marketing facilities, less knowledge about BT cotton production practices, lack of knowledge about fund availability from the government. State Department of Agriculture and University of Agricultural Sciences should make integrated extension efforts (trainings, demonstrations, field days, literatures etc.), provide marketing facilities, promote BT cotton growers and groups to provide the

required technical knowledge about production practices of growers for maximum adoption Bt cotton production.

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