

Analysis of Profitability and its Impact on Bt & non Bt Cotton-A Case study of Haveri district (Karnataka)

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ABSTRACT

Indian agriculture witnessed technological innovation in the mid sixties, which is termed as 'Green Revolution'. Now it is time to launch a "Gene Revolution" instead of "Green Revolution" to feed the world and make Indian farmers rich. Cotton is also called as white gold in the field of textile industry; Cotton is one of the important cash crops of the country. It occupies a significant place in the agricultural and industrial (textile) economy of the country. Nearly 15 million farmers spread out in over 10 states are dependent on cotton cultivation for their livelihood

The present study is designed with the following objectives:

- To analyse the price sensitivity of Bt cotton and non-Bt cotton in Haveri district.
- To find out the profitability and its impact on Bt and non-Bt cotton in Haveri district.
- To find out the problems faced by cotton growers at the time of production and marketing.

H¹ There is more uniformity in price sensitivity of cotton during lean period and less uniformity during peak period.

H² The profitability of cotton is directly influenced by the cost of cultivation.

This study is descriptive and exploratory in nature. Both primary and secondary sources of data are used in the study. The area covers seven taluqs of the district

The co-efficient of correlation is 0.65. The results read as prices of cotton in regulated market of Karnataka increases, the arrival decreases and vice-versa, H¹ is accepted The average profit is gained to Bt cotton growers by 49851.24 mean value than non-Bt cotton. Profitability of Bt-cotton is directly influenced by the cost of cultivation. H² is accepted in the study area. There is a substantial reduction in the pesticide use and the cost of Bt cotton in the study area. The relative gain of Bt cotton over non Bt cotton in the study area is favourable to Bt cotton growers.

It is also concluded that the method of cultivation is financially feasible in all size group of farmers in study area. H² is also accepted with statistical evaluation. The high seed cost of Bt cotton in the study area is the main problem with the sample farmers with 73.58 percent, represents first rank. It is followed by non available of quality seeds and low market price

Keywords : Cotton Study, Analysis

Introduction

Indian agriculture witnessed technological innovation in the mid sixties, which is termed as 'Green Revolution'. The discovery of High Yielding Varieties (HYV's), the package of practice for realising their potential, the mechanization of agriculture involving the development of machinery system for irrigation, tillage, harvesting, threshing etc are regarded as technological innovations in agriculture.

Now withstanding the above constraints, agriculture in India has undergone changes of one kind or the other, mostly in the positive direction during the past three decades. It was the Green Revolution in the seventies followed by White Revolution in the Eighties. More recently, the country is witnessing the 'Blue and Yellow revolutions' for the improvement of agriculture production. Now it is time to launch a "Gene Revolution" instead of "Green Revolution" to feed the world and make Indian farmers rich. The advancement of bio-technology is having dramatic impacts on global agricultural production. The share of agriculture sector of GDP is at 16.93 during 2011.

Importance of Cotton in Agriculture:

Cotton is also called as white gold in the field of textile

industry; Cotton is one of the important cash crops of the country. It occupies a significant place in the agricultural and industrial (textile) economy of the country. Nearly 15 million farmers spread out in over 10 states are dependent on cotton cultivation for their livelihood.

The cultivation of Bt cotton has increased the profitability and net income of farmers. The average net return has been ` 13,168 a hectare against ` 4,484 a hectare in non-hybrid variety crop. A recent nationwide survey of more than 3000 farmers by AC Nielsen found that for biotech cotton farmers in India, profits increased 78 percent, on average, over farmers who planted traditional varieties. Yield increase 29 percent, on average. Pesticide use decline by 60 percent, on average. The crop would be harvested in 150 to 180 days, had saved 26 labour days hectare. However, the seed cost is up by 16 percent.

Bt cotton among Indian farmers proves the success of biotechnology in the field of agriculture. The Karnataka's Bt cotton farmers appear on top of the world. Monsanto Company is now developing the second-generation Roundup Ready Flex (RRF) cotton hybrids, which is expected to increase the flexibility of application and greater weed control efficacy.

Objectives of the study

The aim of the study is to analyse the problems associated with cost and profitability of production and marketing of Bt cotton and non-Bt cotton in Haveri District.

The present study is designed with the following objectives:

- To analyse the price sensitivity of Bt cotton and non-Bt cotton in Haveri district.
- To find out the profitability and its impact on Bt and non-Bt cotton in Haveri district.
- To find out the problems faced by cotton growers at the time of production and marketing.

Hypothesis

H1 There is more uniformity in price sensitivity of cotton during lean period and less uniformity during peak period.

H2 The profitability of cotton is directly influenced by the cost of cultivation.

Methodology

This study is descriptive and exploratory in nature. Both primary and secondary sources of data are used in the study. The area covers seven taluks of the district viz. Haveri, Hirekerur, Ranebennur, Byadgi, Hanagal, Savanur and Shiggaon in which, Bt cotton and non-Bt cotton cultivation is carried an extensive scale. The primary data is collected from 315 cotton growers spread over the seven taluks. The farmers are selected at random of different sizes and the selected farmers are duly categorised under marginal, small and large farmers. The secondary information is collected from various published and unpublished materials from district/state offices. The statistical tools are used to analysed and interpretation of the data.

The seasonal indices in the prices and arrivals of cotton in Karnataka is shown in table no.1

Table 1 : Seasonal Indices in the Prices and Arrivals of Cotton in Regulated Markets of Karnataka 2005-06 to 2010-2011 (In Percentage)

Sl No	Month/Period	Prices (X)	Arrivals (Y)
I	Peak Period – Co-efficient of correlation:-0.260416		
01	October	8.39	10.52
02	November	8.54	23.17
03	December	7.77	19.88
04	January	8.65	10.91
05	February	8.27	9.21
II	Mid Period- Co-efficient of correlation:-0.181368		
06	March	8.86	7.96
07	April	8.41	7.26
08	May	8.76	2.90
III	Lean Period- Co-efficient of correlation-0.995778		
09	June	9.22	1.51
10	July	9.43	1.28
11	August	9.46	1.08
12	September	8.26	2.73
	Co-efficient of correlation: -0.645494		

Source: Prepared from data of directorate of Economics and statistics, Bangalore.

Table no1 indicates that percentage of month wise seasonal variation of wholesale price and arrivals from 2005-06 to 2010-2011. The price parity index clearly reveals the fact that growth rate of cotton and arrivals movement. The arrivals of cotton were higher in the month of peak period (October to February) in all the markets. Never the less, the arrivals start decreasing sharply from June/July onwards, Arrivals were the lowest in the month of August i.e., 1.08 percent of arrivals. The arrivals in peak period varied between 9.21 percent to 81.55 percent, whereas during lean period the arrivals varied between 14.61 percent to 23.17 percent.

The table clearly concluded that the seasonal character of percentage of wholesale prices coincided with the characteristics of the market arrivals of cotton. Price percentages were depressed when the market arrivals were heavy. Thus the arrivals were heavy during October to February and consequently during the period the price prevailed low in the market.

The co-efficient of correlation is 0.65. The results read as prices of cotton in regulated market of Karnataka increases, the arrival decreases and vice-versa, H¹ is accepted

The average profit Impact on Bt cotton during 2010-11 is shown in the table no.2

Table 2 : Average Profit impact of Bt cotton-2010-11

Average Items	Bt cotton			Non-Bt cotton			Gain with Bt
	Mean	S.D	C.V	Mean	S.D	C.V	
A.R	166836	3684	1008.56	27419.59	881.61	246.10	139416.41
A.C	46346.07	4781.16	1303.24	16511.67	16131.12	441.12	29834.44
A.P	60489.33	8465.09	2305.36	10638.09	2456.27	669.37	49851.24

Source: Prepared from data collected from farmer respondents

The table No. 2 exhibits that the average revenue of Bt cotton gained with 139416.41 mean value than non Bt cotton, in correspondence with this average cost of Bt cotton is also more with 29834.44 mean value. The average profit is gained to Bt cotton growers by 49851.24 mean value than non-Bt cotton. Profitability of Bt-cotton is directly influenced by the cost of cultivation.H² is accepted in the study area.

The performance of Bt cotton, relative to Non-Bt cotton in the reduction of pesticide use. The information shows that pesticides are still used by farmers after shifting to Bt cotton. However, there is a significant reduction in the number of sprays that are applied as well as the cost of pesticides, which is shown in table no.3

Table 3 : Application of Pesticides in Bt and Non Bt cotton-2010-11

Farmers	Bt Cotton		Non-Bt-Cotton	
	Average No of Sprays	Cost per Hectares	Average No of Sprays	Cost per Hectares
Marginal	1.11	500	4.25	1240
Medium	1.15	740	5.45	1300
Large	1.19	800	6.89	1400
Average	1.15	680	5.53	1313.33

Source: Data collected through interview

The table no.3 reveals that the average number of spray in Bt cotton is reduced from 5.53 to 1.15, which is 79 per cent of reduction. The cost per hectare is reduced by 48 per cent. Thus, even though pesticide spraying is not eliminated, there is a substantial reduction in the pesticide use and the cost.

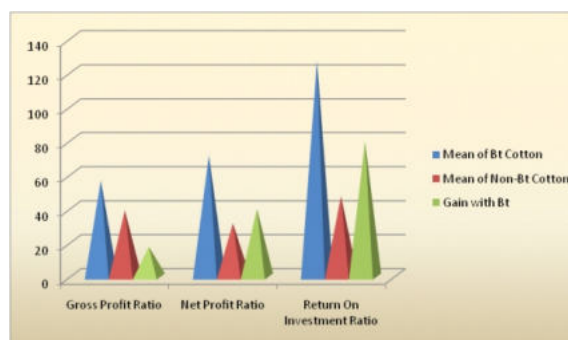
The profitability impact of Bt cotton during 2010-11 is shown in table no.4

Table 4 : Profitability impact of Bt cotton-2010-11

Profitability Ratio	Bt cotton			Non-Bt cotton			Gain with Bt
	Mean	S.D	C.V	Mean	S.D	C.V	
GPR	56.48	5.98	2.98	39.02	7.76	2.90	17.46
NPR	71.31	23.74	7.07	31.41	7.99	2.77	39.90
ROIR	127.12	33.57	9.86	47.41	17.63	5.35	79.71

Source: Prepared from data collected from farmer respondents

Note GPR=Gross Profit Ratio
NPR=Net Profit Ratio
ROIR=Return On Investment Ratio



The table No. 4 reveals that low GPR may due to increase in cost of production without corresponding increase in sales; it is true in case of large farmers i.e., 50.41 and 31.48 percent GPR of Bt and non Bt cotton respectively. On an average, the GPR of Bt and non Bt cotton crop is 56.48 and 39.02 percent respectively.

The table also reveals that the GPR gain with Bt is 17.46 mean value, which is higher than non-Bt cotton. The NPR and ROI are also higher with 39.90 and 79.71 mean value. The relative gain of Bt cotton over non Bt cotton in the study area in favourable to Bt cotton growers.

The cost benefit ratio impact of Bt cotton during 2010-11 is shown in table no.5

Table 5 : Cost benefit Ratio impact of Bt cotton-2010-11

Cost Benefit Ratio	Bt cotton			Non-Bt cotton			Gain with Bt
	Mean	S.D	C.V	Mean	S.D	C.V	
	2.23	0.3005	0.4581	1.48	0.1762	0.3333	0.75

Source: Prepared from data collected from farmer respondents

The table No. 5 depicts that the Cost Benefit Ratio is more than one in case of all types of farmers. It indicates that every rupee of investment in Bt and non- Bt Cotton cultivation contributes towards maximization of wealth. It is also concluded that the method of cultivation is financially feasible in all size group of farmers in study area. H2 is also accepted with statistical evaluation.

The Cost Benefit Ratio of Bt and non- Bt Cotton cultivation of marginal farmers is more (i.e. 2.54 and 1.67 ratio respectively), than small and large farmer. The financial feasibility of Bt and non- Bt Cotton cultivation is favourable to marginal farmers and followed by small and large farmers. The cost benefit ratio of Bt cotton growers is gained by 0.75 mean value than non Bt cotton.

Problems faced by the sample farmers in cultivation of Bt cotton in the study area during 2010-11 is shown in table no.5

Table 6 : Problems faced by sample farmers in cultivation of Bt cotton in Haveri district during 2010-11

Sl.No	Problems	Garret Score	Rank
01	High Seed Cost	73.58	1
02	Non availability of quality seeds	71.54	2
03	Low market price	58.83	3
04	No market structure	51.37	4
05	Medium staple variety	49.93	5
06	Inferior quality	43.75	6
07	Pest occurrence	42.48	7
08	Low yield	33.30	8

Source: Data collected from field survey

The table no 5 interprets that the high seed cost of Bt cotton in the study area is the main problem with the sample farmers with 73.58 percent, represents first rank. It is followed by non available of quality seeds and low market price The government export policy has direct effect with the market price of cotton during 2010-11. Low yield of cotton represents eighth rank, It has no problem for sample farmers in Bt cotton.

Findings

1. The arrivals of cotton were higher in the month of peak period (October to February) in all the markets. Arrivals were the lowest in the month of August i.e., 1.08 percent of arrivals. The arrivals in peak period varied between 9.21 percent to 81.55 percent, whereas during lean period the arrivals varied between 14.61 percent to 23.17 percent. The co-efficient of correlation is 0.65. The results read as prices of cotton in regulated market of Karnataka increases, the arrival decreases and vice-versa, H1 is accepted
2. Profitability of Bt-cotton is directly influenced by the cost of cultivation. H2 is accepted in the study area.
3. Analysis of the GPR gain with Bt is 17.46 mean value, which is higher non-Bt cotton. The NPR and ROI are also higher with 39.90 and 79.71 mean value. The relative gain of Bt cotton over non Bt cotton in the study area in favourable to Bt cotton growers. It is also concluded that the method of cultivation is financially feasible in all size group of farmers in study area. H2 is also accepted with statistical evaluation.
4. The high seed cost of Bt cotton in the study area is the main problem with the sample farmers with 73.58 percent, represents first rank. It is followed by non available of quality seeds and low market price.

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