

Constraints in adoption of growing *Bt*. Cotton among *Bt*. growers in Haryana

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Abstract

*Cotton plays a very important role as a cash crop which also provides 75 percent of the raw material to the textile industries. It acts as a source of income to about 60 million of people. Keeping in view the prominence and utility of *Bt*. Cotton this study was designed to know the constraints in adoption related to various aspects such as production, input, marketing and financial among the farmers of Jind District of Haryana State, India. A total sample of 120 respondents was taken from the blocks Alewa and Jind of Jind District. Lack of agricultural labour, high cost of seed, lack of irrigation facilities, low prices of farm production and complicated loan process of the bank were found to be the major problems faced by the farmers with regard to different aspects. By providing facilities at ground level these constraints can be surmounted.*

Keywords: Cash crop, textile industries, income, constraints, adoption, production, marketing, input and financial

Introduction

Cotton is considered as one of the most important cash crop in India as it successfully provides 75 percent of the raw material to the textile industry. Where, more than 80 percent of the rural population is dependent on agriculture and its allied activities for their livelihood. In the same manner, cotton production also gives a source of income to about 60 million people. India, “an agricultural county” has a vast area under agricultural production but with a problem of low productivity.

United States Department of Agriculture (USDA 2019) claimed that since 2014-15, the world’s consumption rate of cotton has been increasing expeditiously. In 2019, Cotton Advisory Board (CAB) guesstimated that Haryana’s production will be 5.52q/ha during 2018-19 and in 2017-18 it was noted to be 5.49 q/ha (Ministry of textile, 2019).

Bt. is referred for *Bacillus thuringiensis* and it is a modified crop. A toxic gene known as *Bt*. gene inserted into the cotton gene via genetic engineering. This toxin is not harmful to the plant as due to the genetic engineering they got adapted. As a result, plants became anti-ballworm. And also another gene which is accountable for the high yield of the crop

inserted in the same to improve the production rate. Needless to say this seed grows into HYPR (High Yielding Pest Resistant) cotton crop which we popularly call *Bt*. Cotton. It was observed in Australia that after the adoption of these genetically modified crops, the pesticide usage had been reduced by 85 percent if compared to the previous conventional years (ABCA 2017). With time, some more genetically modified crops were also introduced which were having features such as improved fiber quality, disease resistance, maturity and regional adaptability. And also some attempts are made in order to make crop drought tolerant (Cotton Australia, 2019).

During 2016-17, Haryana’s production was 20.50 lakh bales of cotton and labeled itself as the topmost state in the north zone. In 2016-17, Haryana production in cotton was improved by 6 percent all over India. Whereas 2011-12 and 2012-13 were registered as the peak cotton production years with 26 lakh bales of cotton (The Cotton Corporation of India Ltd. 2018).

In the developing countries, it is the topic of consideration whether the *Bt*. Cotton is beneficial to the smallholder farmers or it is adding any type of social and economic hardship to them. The cotton farmers seeing this technology as unsustainable and

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incompetent for providing livelihood security. Maharashtra State was enormously affected by pink bollworm infestation which resulted in poor production. So as protective measures some other genetically modified crops were introduced then (The Economic Times, 2018).

During the last decade, more and more farmers had gone for the cotton cultivation. According to the data provided by Agriculture Contingency Plan District, Jind has the net sowing area of about 2,35,000 ha. Day by day more farmers were noticed to move forward toward the adoption of *Bt. Cotton* as it is a cash crop which results in good price of the production (Press Information Bureau Government of India, Ministry of Agriculture & Farmers Welfare, 2018). By keeping in view the prominence and utility of growing *Bt. Cotton*, this study was designed with the following objectives: (i) to know the constraints in adoption of *Bt. Cotton* technology related to input aspects, (ii) to know the constraints in adoption of *Bt. Cotton* technology related to production aspects, (iii) to know the constraints in adoption of *Bt. Cotton* technology related to marketing aspects and (iv) to know the constraints in adoption of *Bt. Cotton* technology related to financial aspects.

Methodology

Jind District of Haryana was selected

purposely for this study of India because a large area of land is covered under *Bt. Cotton* production and so as the large number of farmers involved in its production. To draw the sample of total 120 respondents, two blocks i.e. (i) Alewa and (ii) Jind were selected.

Results and Discussion

In Table 1, regarding constraints in adoption of *Bt. cotton* technology related to input aspects was analyzed and data revealed that lack of labour is the very serious constraint found to be among the respondents with 68.33 percent followed by high cost of seed with 63.33 percent, non-availability of inputs at village level with 62.50 percent, not enough availability of quality seed with 55.83 percent and non-availability and high price of quality fertilizers by 51.67 percent.

Constraints in adoption of Bt. Cotton technology related to production aspects

Data analysis clearly unveiled that respondents were facing problems related to production aspects among which lack of irrigation facilities was mostly rated problem with 59.17 percent in very serious category followed by inadequate knowledge regarding insect pest control with 56.66 percent, non-availability of labour with 50.83 percent, not sure about crop success with 48.34 percent and crop failure due to

Table 1: Constraints in adoption of *Bt. Cotton* technology related to input aspects (n=120)

S.No.	Constraints related to input	Very serious	Serious	Not serious
1.	Lack of agricultural labour	82(68.33)	25(20.84)	13(10.83)
2.	High cost of seed	76(63.33)	32(26.67)	12(10.00)
3.	Non availability of inputs at village level	75(62.50)	40(33.33)	5(4.17)
4.	Not enough availability of quality seed	67(55.83)	33(27.50)	20(16.67)
5.	Non availability and high price of quality fertilizers	62(51.67)	41(34.16)	17(14.17)

*Figures in Parentheses indicate percentage.

Table 2: Constraints in adoption of *Bt. Cotton* technology related to production aspects (n=120)

S.No.	Constraints related to production	Very serious	Serious	Not Serious
1.	Crop failure due to unfavorable weather condition	54(45.00)	42(35.00)	24(20.00)
2.	Inadequate knowledge regarding insect pest control	68(56.66)	38(31.67)	14(11.67)
3.	Non-availability of labour	61(50.83)	48(40.00)	11(9.17)
4.	Lack of irrigation facilities	71(59.17)	43(35.83)	6(5.00)
5.	Not sure about crop success	58(48.34)	47(39.16)	15(12.50)

*Figures in Parentheses indicate percentage.

unfavorable weather condition with 45 percent which all fall under the same category (Table 2).

Constraints in adoption of Bt. Cotton technology related to marketing aspects

In Table 3, it is clearly revealed that respondents were having constraints related to market aspect such as low prices of farm production at harvesting time, lack of marketing guidance, inadequate marketing facilities at village level, delay in payment by the marketing agencies and inadequate grading system with 60.83 percent, 56.67 percent, 56.67 percent, 46.67 percent and 42.50 percent respectively on a very serious note.

Constraints in adoption of Bt. Cotton technology related to financial aspects

Data analyzed shown in Table 4 revealed that 68.34 percent of the respondents were having very serious problem regarding complicated loan processing system of the bank whereas 50.83 percent of the respondents were having problem related to the high rate of interest by money lenders on a very serious note.

On the basis of the findings of this study, it can be deduced that there were constraints related to input aspects, production aspects, marketing aspects and financial aspects faced by the respondents. 'Lack of

agricultural labour', 'High cost of seed', 'Non availability of inputs at village level', 'Inadequate knowledge regarding pest control', 'Lack of irrigation facilities', 'Crop failure due to unfavorable weather condition', 'Low price of farm production', 'Lack of marketing guidance' and 'Lack of knowledge about loan processing system of the bank' were the major constraints faced by the respondents. Similar results were also revealed by Godara *et. al.*, (2012), Visawadia *et. al.*, (2006), Arshad *et. al.* (2007) and Singh *et. al.*, (2013). Rani and Salvaraj (2015) stated lack of marketing knowledge while Rai and Singh (2010) unearthed unstructured bank loan policy as a constraint among the farmers. The study found that due to saline nature of soil and water the production was less in Jind district. Also they were facing inadequate irrigation facilities. Respondents also reported that the quality of seed was not good.

Conclusion

The main constraints faced by the respondents were lack of agricultural labour, lack of irrigation facilities, unfavorable weather conditions, high cost and quality of seeds, low price of farm production, and lack of facilities at village level such as marketing facilities, non availability of inputs and also high rate of interest by the money lenders during the study.

Table 3: Constraints in adoption of *Bt.* Cotton technology related to marketing aspects (n=120)

S.No.	Constraints related to market	Very serious	Serious	Not Serious
1.	Low prices of farm production at harvesting time	73(60.83)	32(26.67)	15(12.50)
2.	Lack of marketing guidance	68(56.67)	36(30.00)	16(13.33)
3.	Inadequate marketing facilities at village level	68(56.67)	41(34.17)	11(9.16)
4.	Delay in payment by the marketing agencies	56(46.67)	38(31.66)	26(21.67)
5.	Inadequate grading system	51(42.50)	54(45.00)	15(12.50)

*Figures in Parentheses indicate percentage.

Table 4: Constraints in adoption of *Bt.* Cotton technology related to financial aspects (n=120)

S.No.	Constraints related to financial aspects	Very serious	Serious	Not Serious
1.	Complicated loan processing system of the bank	82(68.34)	35(29.16)	3(2.50)
2.	Lack of input purchasing power	71(59.16)	38(31.67)	11(9.16)
3.	Repeated sowing at the time of rain	68(56.67)	35(29.16)	17(14.17)
4.	High rate of interest by money lenders	61(50.83)	41(34.17)	18(15.00)

*Figures in Parentheses indicate percentage.

Suggestions

Farmers should confer from the authorized agencies/ CCS HAU/ any reliable organization before the sowing of crop. The production can be proliferated by providing quality seeds at economical prices. Services and inputs should be available at village level at cheaper rate. Proper and timely management of sucking pest should be done by the farmers. New and with more qualities seeds should be developed according to environment and geographical conditions of the area. Transparent, genuine and legitimate set-up should be there for marketing purpose.

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