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## Constraints faced by BT cotton growers in adoption of drip irrigation system and its management practices in Parbhani District of Maharashtra

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### Abstract

The present study was conducted in Parbhani District of Marathwada region of Maharashtra to find out the various constraints faced by BT cotton growers in adoption of drip irrigation system and its management practices and also seeking suggestions given by BT cotton growers to overcome the constraints. A total number of 120 respondents were selected through purposive sampling from three blocks namely Sailu, Pathri and Jintur. Descriptive research design was followed for the study. Result of the study shows that the constraints faced by BT cotton growers in adoption of drip irrigation system were lack of funds and financial resources (91.60 percent), lack of knowledge about drip irrigation (82.5 percent) and non-availability of inputs in time (75 percent) followed by problem of small land holding and fragmented land holding (69.16 percent), low literacy rate (61.67 percent), lack of technical guidance (58.34 percent) and lack of access to weather forecasting technology were also reported by considerable number of respondents. While, problem of high initial cost of drip unit, non-availability of subsidies in proper time, inadequate supply of electricity and problem of incomplete knowledge about drip irrigation were considered as minor constraints by the respondents. Suggestions given by majority of the respondents that cost of drip irrigation should be less; there should be regular visit of dealers or suppliers for supervision and evaluation of drip irrigation system, regular guidance and after sale service for maintenance from dealers.

**Keywords:** BT cotton, constraints, drip irrigation, suggestions

### Introduction

Cotton is one of the most important fiber and a cash crop of India and plays a dominant role in the industrial and agricultural economy of the country. Cotton is cultivated in about 60 countries of the world. Amongst, India occupies largest area (9.3 m. ha.) under cotton. The economic loss in cotton through pests is serious concern. The bollworm complex causes significant yield losses, further the harmful effects of the insecticides lead to environmental pollution and more specifically increases the cost of cultivation. In this context application of biotechnology was seen as a solution and thus, the efforts were taken that resulted in developing BT cotton (Rajput and Chinchmalatpure, 2016)<sup>[7]</sup>.

BT cotton genetically engineered with BT (*Bacillus thuringiensis*), a biotoxin which comes from soil bacterium. BT which isolated from soil in 1911, has been available to farmers as an organic pesticide since 1930 (Ashok, 2006)<sup>[1]</sup>. BT cotton offers protection from bollworms right from early days of crop, leading to a healthy crop, better boll retention, greater harvest and more profit. The area under BT cotton is constantly increasing in all the states of the country since its induction. The major states growing BT cotton in 2006, in order of hectareage, were Maharashtra (1.840 million ha representing 48 percent of all BT cotton in India in 2006) followed by Andhra Pradesh (830,000 ha or 22 percent), Gujarat (470,000 ha or 12 percent), Madhya Pradesh (310,000 ha or 8 percent) and 215,000 ha (6 percent) in Northern Zone and the balance in Karnataka and Tamil Nadu and other states (James 2006)<sup>[4]</sup>.

Drip irrigation is a type of micro irrigation, which plays a major role in water conservation and increasing the productivity of the crops by utilizing every single drop of water. Drip irrigation is an advanced system which will irrigate the crop directly through water with the help of motor and PVC pipes. Unlike the traditional irrigation methods, drip irrigation makes sure the water reaches till the root of the plant (Kaarthikeyan and Suresh, 2019)<sup>[5]</sup>.

Cotton is highly water sensitive crop so adoption of drip irrigation system is highly beneficial for the crop. Drip irrigation system has the potential to increase the productivity of cotton and efficiently addressing the issue of water scarcity.

Cultivation of BT cotton crop provides high economic returns to the farmers, but on the other hand there are many risks involved in it. The production of BT cotton also needs costly inputs in terms of seeds, fertilizers and pesticides. If not taken care properly, it may lead to negative outcomes as a result. It is also highly sensitive crop to water and some diseases and pests. It is known to be a risky crop considering natural hazard. The farmers are always facing some problems in adoption of new technologies. So, the purpose of this research work is to find the constraints faced by BT cotton growers in adoption of drip irrigation system and its management practices and also seeking their suggestion regarding that.

### Research Methodology

Descriptive research design was followed for the study as it describes the characteristics or phenomena that are being studied. The present study was conducted in Parbhani district of the Marathwada region of Maharashtra because large number of farmers is BT Cotton grower in the district. Sailu, Jintur and Pathri talukas were selected by purposive sampling as they have highest area under drip irrigation in BT Cotton. From the selected block, twelve villages were selected purposively based on the fact that area highest hectare under BT cotton crop. Ten respondents from each village were selected through purposive sampling technique thus, a total number of 120 farmers constitute the sample size. Structured interview schedule was used for collection of data from respondents. Primary data was collected with the help of personal interview schedule with specially focused objectives for the study. Secondary data was collected from library, journal, book and other materials related to study. The entire data further transformed into score for tabulation and subjected to appropriate statistical methods like frequency distribution, percentage analysis and rank scoring.

### Results and Discussion

**Table 1:** Distribution of the respondents according to the constraints faced by them in adoption of drip irrigation management practices.

Sr. No.	Constraints	Frequency (n=120)	Percentage
1	Lack of fund/ financial resources	110	91.60
2	Lack of knowledge about drip irrigation	99	82.50
3	Non- availability of inputs in time	90	75.00
4	Lack of training	85	70.83
5	Small land holding and fragmented land holding	83	69.16
6	Low literacy rate	74	61.67
7	Lack of technical guidance	70	58.34
8	Lack of access to weather forecasting technology	63	52.50
9	Higher initial cost of drip unit	60	50.00
10	Subsidies not available in proper time	56	46.67
11	Inadequate supply of electricity	50	41.66
12	Incomplete knowledge about drip irrigation	45	37.50

From Table1 it was noticed that lack of funds and financial resources was the main constraint in the adoption of management practices of drip irrigation in BT cotton which was reported by 91.60 percent of respondents. 82.5 percent respondents facing the constraint of lack of knowledge about drip irrigation, 75 percent respondent having problems of non- availability of inputs in time whereas, 70.83 percent respondents facing problems of lack of training. Problem of small land holding and fragmented land holding was facing by 69.16 percent of respondents while, 61.67 percent of respondents having problem of low literacy rate, 58.34 percent respondents facing lack of technical guidance, 52.50 percent respondents having lack of access to weather forecasting technology and half number (50%) of the respondents facing problem of high initial cost of drip unit. 46.67 percent respondents informs that subsidies not available in proper time for, 41.66 percent respondents facing inadequate supply of electricity whereas, 37.5 percent respondents facing problem of incomplete knowledge about drip irrigation. Similar findings were also reported by Meti (2012)<sup>[6]</sup>.

**Table 2:** Suggestions of drip adopters to overcome the constraints.

Sr. No.	Suggestions	Frequency (n = 120)	Percentage
1.	Cost of drip should be less	87	72.50
2.	Regular visit of dealers for supervision and evaluation of drip system	84	70.00
3.	Regular guidance and after sale service for maintenance from dealers	80	66.67
4.	Regular guidance and supervision from water management scientists and drip irrigation experts	79	65.83
5.	Spare parts should be made available locally at reasonable rates	76	63.33
6.	Training should be provided for improving knowledge and skill	75	62.50
7.	Timely availability of subsidy or loans	73	60.83
8.	Demonstrations should be frequently organized by manufactures or dealers	70	58.33
9.	Dealers should be diploma or degree holder	67	55.83

It is indicated from Table 2 that 72.50 percent of respondents suggested that cost of drip irrigation should be less, 70.00 percent suggested that there should be regular visit of dealers or suppliers for supervision and evaluation of drip irrigation system, regular guidance and after sale service for maintenance from dealers (66.67 percent), regular guidance and supervision from water management scientists and drip irrigation experts (65.83 percent), spare parts should be made available locally at reasonable rates (63.33 percent), training should be provided for improving knowledge and skill (62.50 percent), timely availability of subsidy or loans (60.83 percent), demonstrations should be frequently organized by manufactures or dealers (58.33 percent) and 55.83 percent respondents suggested that dealers should be diploma or degree holder.

### Conclusion

It is concluded from the above findings that there are many social, technical and personal constraints were there in adoption of drip irrigation system faced by BT cotton growers. Some of the major constraints were lack of funds and financial resources, lack of knowledge about drip

irrigation and non-availability of inputs in time which were reported by many respondents. Problem of small land holding and fragmented land holding, low literacy rate, lack of technical guidance and lack of access to weather forecasting technology were also reported by considerable number of respondents. While, problem of high initial cost of drip unit, non-availability of subsidies in proper time, inadequate supply of electricity and problem of incomplete knowledge about drip irrigation were considered as minor constraints by the respondents. It is suggested by majority of the respondents that cost of drip irrigation should be less there should be regular visit of dealers or suppliers for supervision and evaluation of drip irrigation system, regular guidance and after sale service for maintenance from dealers.

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