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A study of technological gap in cultivation of Bt-cotton under FLD through KVK Khargone (M.P.)

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Abstract
Front Line Demonstrations (FLDs) have been proved the best means for creating awareness of new development in technology generation and to assess the various socio-economic variables for affecting the adoption level of farmers as the regular feedback is a necessary component of these demonstrations. KVK in Khargone district has been organizing FLDs on Bt-cotton, therefore keeping in view the researcher's interest a research entitled A Study of Technological Gap and Constraints in Cultivation of Bt-cotton under FLD through KVK Khargone (M.P.) was undertaken. Ex-Post facto design was used for this study. The study was conducted in KVK adopted villages in Khargone district. Khargone district comprises of nine blocks. One block from the district i.e. Gogawan will be purposively selected because this block has been selected for Bt-cotton demonstration. Out of this list 12 farmers will be selected randomly from each village. Therefore, 120 Bt-cotton growers from 10 villages will be selected for the present study. As observed the highest technological gap index in use of bio-fertilizer and FYM 44.44 percent followed by Seed treatment 43.33 percent, adopt of Bt cotton 28.61 percent, method of sowing 37.22 percent, weed management 26.11 percent, seed rate 25.56percent, Insect control 22.50 percent, Selection of variety 21.39 percent, disease management 20.56 percent and same technological gap in Sowingspacing20.56 percent, method of land preparation 20.28 percent, Irrigation 18.61 percent and selection of land 18.33 percent in technological gap about Bt cotton production technology.

Keywords: Technological, cultivation, Bt-cotton, FLD, KVK

Introduction

Cotton is soft, staple fiber that grows around the seeds the cotton plants (*Gossypium sp.*) a shrub native to tropical and subtropical regions around the world, including America, India and Africa. Only in India, all the four spinnable fibre yielding species of Gossypium *viz. Gossypium hirsutum, G. barbadense, G. arboreum* and *G. herbaceum* are cultivated commercially. All the commercial cotton is Native American species (*Gossypium hirsutum* and *Gossypium barbadense).* Bt-cotton, the first genetically modified (GM) crop in India was, initially approved in India on March 26th 2002 for commercial cultivation in six states belonging to southern and central cotton cultivation zones of the country. Cotton production in India during 2018-19 is Maharashtra, Gujarat and Telangana were the major cotton growing states covering around. In Madhya Pradesh, cotton is mainly grown in the districts of Khargone, Khandwa, Chhindwada, Ratlam, Dewas, Burhanpur, Dhar and Barwani. A wide gap exists between the available techniques and its actual application by the farmers which is reflected through poor yield in the farmer's field. This gap is one of the major problems in increasing the productivity of the Bt cotton crop.

Keeping in view the low productivity, it was considered worthwhile to find out how much this program had helped the Bt cotton growers to bring about changes in terms of knowledge and adoption of improved Bt cotton production technology and thereby increasing farm productivity. Further since the inception of front line demonstration no systematic study in Madhya Pradesh has been made to measure its adoption behavior of farmers. It was felt relevant to take up a study entitled, A Study of Technological Gap and Constraints in Cultivation of Bt-cotton under FLD through KVK Khargone (M.P.) with following specific objective.

Objective

1-Technological gap in recommended Bt-cotton cultivation technologies under FLD through KVK.

Review literature

Tripp (2011) examined the performance of transgenic, insect-resistant cotton in four countries (China, India, Colombia and South Africa) are used to examine the adequacy of the institutions required to support the development and delivery of transgenic crops for resource-poor farmers. These institutions include the formal seed sector, the basic regulations that support it, conventional agricultural research and the provision of information to farmers. He argued that inadequacies in these institutions in many developing countries represent significant barriers to the hopes for a rapid uptake of transgenic crops.

Singh *et al.* (2012) [2, 4] conducted a study in Sirsa and Fatehabad districts of Haryana state to measure the farmers' training needs for Bt-cotton production technology and their relationship with selected characteristics of Bt-cotton farmers. The findings of the study revealed that majority of the Bt-cotton farmers (56.67 percent) required intense training on features of Bt-cotton production technology followed by insect surveillance, manures and fertilizer, Bt-cotton varieties, harvesting and marketing.

Joshi *et al.* (2014) [1] revealed the feasibility of the demonstration technology. As such variation in technology index (7.78 to 25.92 percent) during the study period in certain area may be attributed to dissimilarity in the soil fertility condition, pest- diseases attack, non-availability and poor quality of irrigation water and weather condition.

Srinivas *et al.* (2015) [3] recorded 3 qt/ac extension gap through FLDs. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies to reverse this trend of wide extension gap. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap. The new technologies will eventually lead to the farmers to discontinue the old technology and to adopt new technology.

Methodology

Ex-Post facto design was used for this study. The study was conducted in KVK adopted villages in Khargone district. Khargone district comprises of nine blocks. One block from the district *i.e.* Gogawan will be purposively selected because this block has been selected for Bt- cotton demonstration. Out of this list 12 farmers will be selected randomly from each village. Therefore, 120 Bt-cotton growers from 10 villages will be selected for the present study. The primary data was collected with the help of interview schedule, which was prepared on the basis of objectives of the study. For the convenience of data collection, the interview schedule was prepared in Hindi. The interview schedule was presented to sample of 20 farmers in non- sampled area before the actual collection of the data. The secondary data was obtained from the various government offices like District Agriculture Office, Teshil Office, Land record office, Krishi Vigyan Kendra in Khargone (M.P.), Block Development Office, different magazines, annual reports and publications etc. Data collected was qualitative as well as quantitative. The quantitative data were interpreted in terms of percentage and qualitative data were tabulated on the basis of approved categorization method. The percentage, mean, standard deviation and correlation coefficient were worked out in the study for analysis of data.

Result and Discussion

Table 1: Measure the technological gap in Bt cotton production technological under FLD through KVK programme as adopted by Bt cotton FLD beneficiaries n=120

S. No.	Package of practice	Average adoption score	Technological gap index
1.	Selection of land	294	18.33
2.	Method of land preparation	287	20.28
3.	Selection of Variety	283	21.39
4.	Seed rate	268	25.56
5.	Seed treatment	204	43.33
6.	Use of bio fertilizer and FYM	200	44.44
7.	Applications of chemical fertilizer	227	36.94
8.	Method of Sowing	260	27.78
9.	Space of Sowing	286	20.56
10.	Irrigation	293	18.61
11.	Weed Management	266	26.11
12.	Insect Control	279	22.50
13.	Disease Management	286	20.56
14.	Adoption of Bt cotton	257	28.61

The data further analyzed to know the adoption and technological gap index of the different aspects as shown in table.

It is seen from the table that the highest technological gap index in use of bio-fertilizer and FYM (score 44.44) followed by seed treatment (score 43.33), adoption of Bt cotton (score 28.61), method of sowing (score 27.78), weed management (score 26.11), seed rate (score 25.56), insect control (score 22.50), selection of variety (score 21.39), disease management (score 20.56) and same technological gap in space of sowing (score 20.56), method of land preparation (score 20.28), irrigation (score 18.61) and selection of land (score 18.33) in technological gap about Bt cotton production technology.

Bt cotton (score 28.61), method of sowing (score 37.22), weed management (score 26.11), seed rate (score 25.56), insect control (score 22.50), selection of variety (score 21.39), disease management (score 20.56) and same technological gap in space of sowing (score 20.56), method of land preparation (score 20.28), irrigation (score 18.61) and selection of land (score 18.33) in technological gap about Bt cotton production technology.

Table 2: Overall adoption by FLD through KVK beneficiaries of technological gap in BT cotton production technology, n=120

S. No.	Categories	Frequency	Percent
1.	Low	31	26.19
2.	Medium	35	29.05
3.	High	54	45.12

Table 2 reveals that most of the respondents 45.12 percent were found in the high category of technological gap, there were 29.05 percent of the respondents who had medium level of technological gap while 26.19 percent respondents had low level of technological gap. It implies that extension agencies should make efforts so that more and more Bt cotton growers have high technological gap.

Measure the technological gap in Bt cotton production

technological under FLD through KVK programme as adopted by Bt cotton FLD beneficiaries.

As observed the highest technological gap index in use of bio-fertilizer and FYM 44.44 percent followed by Seed treatment 43.33 percent, adopt of Bt cotton 28.61 percent, method of sowing 37.22 percent, weed management 26.11 percent, seed rate 25.56 percent, Insect control 22.50 percent, Selection of variety 21.39 percent, disease management 20.56 percent and same technological gap in Sowing spacing 20.56 percent, method of land preparation 20.28 percent, Irrigation 18.61 percent and selection of land 18.33 percent in technological gap about Bt cotton production technology.

Conclusion

As observed the highest technological gap index in use of bio-fertilizer and FYM 44.44 percent followed by Seed treatment 43.33 percent, adopt of Bt cotton 28.61 percent, method of sowing 37.22 percent, weed management 26.11 percent, seed rate 25.56percent, Insect control 22.50 percent, Selection of variety 21.39 percent, disease management 20.56 percent and same technological gap in Sowing spacing 20.56 percent, method of land preparation 20.28 percent, Irrigation 18.61 percent and selection of land 18.33 percent in technological gap about Bt cotton production technology.

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