



Research Article

STUDY ON KNOWLEDGE GAP AND POTENTIAL CONSTRAINTS OF BANANA GROWERS IN BHAGALPUR DISTRICT OF BIHAR

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Abstract: The current study is a part of a large project work assessed in Bihar and Tamil Nadu. The first part was carried out in Bhagalpur district of Bihar to examine the knowledge gap of banana growers in Bhagalpur district of Bihar. In Bihar, banana is the second most important fruit crop after mango and is mostly grown in Vaishali and the north eastern Khoshi region. In the tract around the Ganga basin of Bhagalpur district, banana cultivation is commercially cultivated compared to cereals and other plantation crops. Agro climatic situation of Bhagalpur district is well suited for banana cultivation and possesses abundant scope for extension of area under this fruit. The study was conducted with 95 banana growers in Naugachia block of Bhagalpur. The results revealed that 74.84 percent of the respondent expressed knowledge gap in improved banana cultivation technology. Analysis of data related with knowledge gap in different sub – areas of main areas indicated a knowledge gap ranging from 40 percent to 73 percent.

Keywords: Knowledge gap, Training need, Constraints, Banana growers and Bhagalpur

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Introduction

Improvement in Banana (*Musa* spp.) is the “queen of tropical fruit” and it is considered to be one of the oldest fruits known to mankind. It has enjoyed Universal popularity from times immemorial. It is the oldest cultivated tropical fruit in India accounting for 31.07 percent of total fruit production and 12.44 percent of area under fruit crops. At present, India is the largest producer of banana in the world [1]. In Bihar, banana is the second most important fruit crop after mango and is mostly grown in Vaishali and the north eastern Khoshi region. In the tract around the Ganga basin of Bhagalpur district, banana cultivation is commercially cultivated compared to cereals and other plantation crops. Agro climatic situation of Bhagalpur district is well suited for banana cultivation and possesses abundant scope for area expansion. The production and productivity are much lower in the state as compared to other states like Maharashtra, Gujarat and Tamil Nadu. The main reason for the low production and productivity seems to be the lack of scientific knowledge of banana production technology. Majority of the farmers did not have adequate knowledge on production recommendation and that more than half of the production recommendations were not known to them [2]. The majority 68 percent of the banana growers had medium level of knowledge followed by 14.00 percent and 18.00 percent of the respondents had high and low level respectively [3]. Sufficient research has been conducted by Rajendra Prasad Agricultural University through its allied and constituent centres on the basis of which the production technology of banana has been standardized but it seems that the farmers of this state are by and large unaware of latest production technology of banana. Banana is considered as the most important energy provider and is a good source of mineral salts and vitamins. Banana produce more balanced diet than many fruits. Bananas play a key role in the economy and food security of India [4]. It is a wealthy source of carbohydrate with calorific value of 67 calories per 100 g fruit and is one of the well-liked and widely traded fruits across the world [5].

The mixer of rice with ripe banana is the traditional delicious dish for Bangladeshi [6]. Banana being heavy feeder and labour intensive nature of crop, the growers should be trained on its nutrient and water management as well as on post-harvest management technology. This will help in enhancing resource use efficiency, reducing cost of production and enhancing profitability [7].

Application of research: The production and productivity are much lower in Bihar state as compared to other states like Maharashtra, Gujarat and Tamil Nadu. The main reason for the low production and productivity seems to be the lack of scientific knowledge of banana production technology. Hence there was a need to apply research in this area to identify the constraints that hinder the production and productivity factors in Banana cultivation so that suitable strategies and policy implications can be proposed that could enhance the efficiency of banana growers in both the states of Bihar and Tamil Nadu.

Study Objectives

To know the extent of knowledge gap in various components of banana production technology.

To determine the constraints being noticed by the banana growers as perceived by them.

Material and methods

The study was conducted in Bhagalpur district of Bihar. Bhagalpur district was purposively selected as area of banana is high compared to other districts. Among 15 blocks, Naugachia block having the highest acreage under banana cultivation was purposively selected as locale of research. Two banana growing villages having the largest area under banana cultivation were selected. Stratified random sampling procedure was adopted to select the respondents and 95 respondent farmers from each strata were selected by random sampling procedure.

Further, the knowledge gap index for each respondent was calculated in terms of percentage as per the formula given below.

$$\text{Knowledge gap index} = \text{Potential} - \text{Extent} / \text{Potential} \times 100$$

The results were analyzed and interpreted highlighting the knowledge gap in improved banana cultivation technology.

Findings and Discussion

Knowledge of cultivation technology is affected by various socio-economic, personal, and psychological and communication factors of the farmers. Therefore, an attempt was made to explore relationship between the socio-economic, psychological and communicational variables and the level of knowledge of improved banana cultivation technology.

Knowledge gap in the main areas of improved Banana cultivations technology

The gap in the knowledge of the total farmers in relation to improved banana cultivation technology is presented in [Table-1].

Table-1 Knowledge gap in the main areas of improved Banana cultivations technology

S	Main areas	Knowledge possessed (%)	Knowledge gap (%)
1	Pre-planting technique	48.15	51.85
2	Fertilizer management	33.83	66.17
3	Crop management	41.92	58.08
4	Irrigations management	45.05	54.95
5	Plant protections measures	22.16	77.84
6	Post-harvest technology	36.78	63.68
	Mean	38.32	61.68

Results of [Table-1] reveals that maximum knowledge gap was identified as much as 77.84 percent of the respondent reported to have lack of knowledge in the area of plant protection measures. Therefore, first priority was given to plant protection measures in banana cultivation technology. Nutrient management was the second major problem identified from the respondents. Existence of knowledge gap in nutrient management was identified from 66.17 percent of the respondents. In other four areas such as post-harvest technology, crop management, irrigation management and pre-planting technique, the knowledge gap was observed between 63-51 percent. Overall, knowledge gap in improved banana cultivation technology varied from 77.84 percent to 51.85 percent among the respondents of Naugachia block of Bhagalpur district.

Table-2 Knowledge gap in the Sub-areas of pre-planting techniques

S	Sub areas	Knowledge possessed (%)	Knowledge gap (%)
1	Type of land required	51.00	49.00
2	Time of plantation	49.16	50.84
3	Banana pit	51.52	48.48
4	Mannuring	38.83	61.17
5	Selection of variety	45.24	54.76

Results of [Table-2] reveal that, overall 48-61 percent knowledge gap existed in the various sub-areas of the pre-planting technique. Among them, 61.17 percent was maximum and 48.48 per cent was minimum knowledge gap identified. About 50.84 percent of the farmers were not aware of the knowledge of the time of banana plantation. Knowledge gap in the sub areas of selection of variety for dwarf and long of banana came to be 54.76 percent. The minimum knowledge gap was observed in the sub areas of depth and diameter of banana pit. It was to the tune of 48.48 percent.

Table-3 Knowledge gap in the Sub-areas of Fertilizer management

Sub areas	Knowledge possessed (%)	Knowledge gap (%)
Nitrogen (quantity + time)	41.50	58.50
Phosphorus (quantity + time)	35.33	64.67
Potash (quantity + time)	22.66	77.34

The farmers showed 77.34 percent knowledge gap in the sub-areas such as the quantity and time of the use of potassic fertilizers concerning the quantity and time of the use of phosphate fertilizer, the knowledge gap was 64.67 percent and in the case of quantity and time of use of nitrogenous fertilizer the knowledge gap was minimum to the tune of 58.50 percent. The finding that the minimum knowledge gap was in the quantity and time of use of nitrogenous fertilizer, suggests that the

farmers had better knowledge of the dose and time of use of nitrogenous fertilizer in Banana cultivation as compared to the management of other two chemical fertilizers.

Table-4 Knowledge gap in the Sub-areas of crop management

S	Sub areas	Knowledge possessed (%)	Knowledge gap (%)
1	Plant spacing (R to R + P to P)	30.50	68.50
2	Interculture weeding (No. + Time + name of weedicide)	40.16	69.84
3	Desuckering	55.10	44.90

The knowledge gap existed in this sub-area of crop management was 68.50 percent. The farmers were having relatively better knowledge in the number and time of desuckering in this sub-area of crop management and that was 44.90 percent. The sub – area of inter-culture, which included the number and time of weeding and the chemical name of the weedicide, exhibited a knowledge gap of 69.84 percent.

Table-5 Knowledge gap in the Sub-areas of irrigation management

S	Sub areas	Knowledge possessed (%)	Knowledge gap (%)
1	No. of irrigation required	40.33	59.67
2	Days interval	55.50	44.50
3	Critical Stage	42.32	57.68

The maximum gap was observed in the sub-areas of identification of the number of irrigation. It was 57.67 percent in the case of banana farmers. This was followed by 55.68 percent and 52.50 percent in the sub-areas of critical stage and day's interval between the two irrigation. It is important to mention that in the study area, pumping set it the only source of irrigation in the absence of a canal or any other government funded irrigation source. Realizing their present state of economic conditions, the farmers are seemingly not taking interest in possession of scientific knowledge of irrigation management in relation to the banana cultivation because simple acquisition of knowledge is not going to pay the farming community unless the same is translated into action. However, if the use of a technology is not supposed to give a significant result as compared to the investment in it, particularly when the technology is costly one, it is logical that the farmers, specially the farmers with limited resources, will hesitate for using that technology.

Table-6 Knowledge gap in the Sub-areas of Plant protection measure

S	Sub areas	Knowledge possessed (%)	Knowledge gap (%)
1	Viral diseases (symptom + control measures)	21.34	78.66
2	Disease caused by bacterial / insects (Symptom + control measure)	22.98	77.02

The knowledge gap in the sub-areas of identification of the diseases caused by virus along with their control measures was slightly higher i.e. 78.66 percent. Similarly, the gap in the knowledge in the sub-area of disease caused by bacteria was about 77 percent. This indicated that the farmers were not having better knowledge of the control measures of disease caused by virus and bacteria.

Table-7 Knowledge gap in the Sub-areas of post harvest technology

S	Sub areas	Knowledge possessed (%)	Knowledge gap (%)
1	Harvesting time	31.83	68.17
2	Curing of bunch	41.73	58.27

The table revealed that the knowledge gap in the sub-area of harvesting time was to the tune of 68.17 percent. Similarly, the gap in the knowledge in the sub-area of curing of bunch was about 58.27 percent. The study indicated that the vast gap exists in between knowledge possessed by the farmers and the knowledge should have been among the farmers in relation to the post-harvest technology of banana crop. It is clear from the table the main problems that the banana growers perceived were low profit due to high cost of cultivation (86.47%) and susceptibility of plant to disease like banana wilt (84.13%). However, only 22.21 percent felt non- availability of suitable improved variety and 24.31 percent felt as failure in fruit formation due to unfavorable weather conditions. Suggests that intensive programme of training and demonstration should be conducted in the area to update and renew knowledge about banana production technology.

Table-8 Constraints perceived by banana growers

S	Constraints	Frequency	Percentage	Rank	Over all Rank
A	Technological Constraints				
1	Susceptibility of plant disease like panama wilt	80	84.13	I	II
2	Incidence of insect/pest attack like banana weevil	72	75.89	II	VI
3	Poor yield due to nutrient deficiency in the soil	39	41.15	III	IX
4	Non-availability of suitable improved variety	21	22.21	V	XI
5	Failure in fruit formation due to unfavorable weather conditions	23	24.31	IV	X
B	Socio personal Constraints				
1	Lack of knowledge about banana production technology	74	78.00	II	V
2	Lack of contact with Agricultural Scientist, BAO and VLWs	77	81.15	I	IV
3	Poverty of respondent	69	72.73	III	VIII
C	Economic Constraints				
1	Low profit due to high cost of cultivation	83	86.47	I	I
2	High price of chemicals for plant protection	79	83.26	II	III
3	High price of manure and fertilizers	71	74.84	III	VII

Conclusion

The study revealed knowledge gap of banana growers. Maximum knowledge gap in relation to the improved banana cultivation technology was observed in the area of plant protection measures. Followed by fertilizer management (64.67 percent). Similarly, the minimum knowledge gap was found in the area of pre-planting technology (69.84 %)

The analysis of the data related to the knowledge gap in different sub-areas of the main areas indicated a knowledge gap ranging from 48 percent to 77 percent. In the area of pre-planting technique, the knowledge gap in the different components existed in between 43 percent to 61.17 percent. In the area fertilizer management, the gap in the knowledge in different components was observed in between 55.50 percent to 75.34 percent. In the different components of the crop management, this gap found in between 38.90 percent to 69.50 percent. Similarly, in the area of irrigation management the knowledge gap ranged in between 50.50 percent to 59.67 percent in various components. So, for as the gap in the knowledge of various components of plant protection measure was concerned, it existed in between 73.66 percent to 76.02 percent. Finally, in the main area of post-harvest technology, this knowledge gap was observed in between 54.27 percent to 66.17 percent in the different components.

Application of research: The high knowledge gap in all the areas of improved banana Cultivation technology depicts the poor extension effort being made to transfer the technology among the farmers. Hence, efforts should be made for widespread diffusion of the improved banana cultivation technology. This will not only help the banana growers to earn more profit by way at using the improved banana cultivation technology, but will also help bringing more and more farmers under the banana cultivations. Further, while organizing training for banana growers not only the knowledge gap index should be taken into consideration but the farmer's perceived need should be taken care of.

Research Category: Extension Education

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Study area / Sample Collection: Naugachia block of Bhagalpur district of Bihar

Cultivar / Variety / Breed name: Banana (*Musa* spp.), G9 (Grand Nain)

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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