

ASSESS THE KNOWLEDGE LEVEL AND RELATIONSHIP BETWEEN PROFILE OF FARMER ABOUT POLYHOUSE VEGETABLE CULTIVATION PRACTICES

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ABSTRACT

Polyhouse technology offers an excellent opportunity to grow high value crops during off-season with maximum input use efficiency. However, the successful implementation of polyhouse farming requires adequate knowledge about the specific cultivation practices involved. Therefore, the purpose of this study is to evaluate the farmer knowledge about polyhouse vegetable cultivation practices in Southern Rajasthan and also ascertain the relationship between knowledge of farmers with their personal characteristic. The study was carried out in two districts of Rajasthan namely Bhilwara and Chittorgarh. Data was collected through surveys and interviews conducted with farmers in the region. The analysis of the data was done with the help of different statistical tools like frequency distribution, percentage, mean, standard deviation, mean percent score and correlation coefficient. The study clearly shows that majority of respondents (63.00%) were having medium level of knowledge about polyhouse vegetable cultivation practices in study area. They had highest knowledge about the aspect of components of polyhouse and least about nematode infestation in polyhouse and its control methods. There was a significant correlation found between annual income, education level and land holding with knowledge of respondents about polyhouse vegetable cultivation practices.

Keywords : *polyhouse, knowledge, correlation coefficient, ex-post-facto and vegetable cultivation.*

INTRODUCTION

“Protected cultivation” means modification of the plant environment to achieve optimum plant growth and maximum production by avoiding the harmful effect of climatic factors like temperature, humidity, rainfall etc. protected cultivation is a method that regulate the microclimate have an impact on plant growth and development. Several protected growing techniques have been widely implemented in commercial farming as a result of agricultural advancements. The most popular protected cultivation techniques are green house, polyhouse, shade net house. The crops grown in open condition are exposed to vivid environmental condition, attack of insect and pests, whereas the polyhouse provides a more stable environment. Protected cultivation is a promising technology and becoming popular all over the world there are 115 countries in the world which have undertaken greenhouse vegetable cultivation commercially Sabir and Singh (2013). India is the second largest producer of vegetables in the world i.e., next to China. Total vegetable production of India is 191.769 million tons of its total area 10.353 million ha (as per NHB database, 2019-20)

Polyhouse is a widely recognized farming method that generally made of transparent polyethylene sheet which are flexible in creating an indoor independently controlled environment. Polyhouse is a type of green house where specialized polyethene sheet is used as covering materials under which crops are grown in partially or fully controlled climatic condition. Polyhouses are popular all over world for growing of vegetable crops such as capsicum, cucumber, tomato, lettuce, herbs etc. Polyhouse are more suitable for tropical and sub-tropical region like India. Farming in polyhouse is system in which suitable and controlled environmental is created for vegetables and flowers production. In this, farmer can produce off season vegetables and flowers, while in open field, farmers are able to cultivate according to the season. Due to off season vegetable production, where the farmer gets more profits, people get to eat green fresh vegetables off season

As the Off-season vegetable cultivation under polyhouse technology needs skilled knowledge than the normal season production. So, the present study was conducted to know the knowledge level of the farmers about polyhouse vegetable cultivation practices in Southern Rajasthan and

also ascertain the relationship between knowledge of farmers with their personal characteristic.

OBJECTIVES

- (1) To Assess the Knowledge level Profile of Farmer about Polyhouse Vegetable Cultivation Practices
- (2) To ascertain the relationship between knowledge of farmers with their independent variables,

METHODOLOGY

Ex-post-Facto research design was used in the present study (Kerlinger, F. N., 1976). The present study was conducted in two districts of Rajasthan namely Bhilwara and Chittorgarh. The Bhilwara and Chittorgarh district have been selected on the basis of maximum number of polyhouse farmers in southern Rajasthan and is under the jurisdiction are of Maharana Pratap University of Agriculture and Technology, Udaipur. Out of many tehsils two tehsils from each district was selected purposely on basis of maximum number of farmers having polyhouses for protected vegetable cultivation, thus total four tehsils were selected for this study, Therefore, for this study namely Chittorgarh & Bhopal Sagar tehsils from Chittorgarh district and Bhilwara & Mandalgarh tehsils from Bhilwara district was selected purposely for this study. From each tehsil 25 Polyhouse Owners were selected for this study. Hence 50 Polyhouse owners from each district i.e., Chittorgarh and Bhilwara were selected for the present

investigation. Like this total sample of 100 Polyhouse Owners were selected for this study. The investigator himself collected the data from the respondents with the help of pre-tested interview schedule. The collected data were analyzed by using appropriate statistical tools procedures to determine the frequency, percentage, mean, standard deviation, mean percentage score and correlation coefficient (r). Followed the standard methodology as followed by Vegad et al. (2021).

RESULTS AND DISCUSSION

Knowledge level of farmers about polyhouse vegetable cultivation practices

In the present investigation, knowledge was operationalized as the amount of information gained and retained by the respondents regarding vegetable cultivation practices in polyhouse. The knowledge level of all respondents regarding polyhouse production technologies assessed with the help of knowledge test. Based on the knowledge scores obtained by the respondents, mean value and standard deviation were computed. The respondents were classified into three categories on the basis of mean value (71.11) and standard deviation (12.75). The data related to the knowledge level of all respondents indicate that the farmers’ knowledge about polyhouse production technologies had a wide dispersion. The data pertaining to the knowledge level of the respondents about polyhouse vegetable cultivation practices are presented in Table 1

Table 1: Distribution of respondents on basis of level of knowledge of vegetable cultivation practices by polyhouse farmers (n=100)

Sr. No	Knowledge Level	Bhilwara (n ₁ =50)		Chittorgarh (n ₂ = 50)		Total (n=100)	
		f	%	f	%	f	%
1	High (>83.86 score)	09	18.00	07	14.00	16	16.00
2	Medium (58.35-83.86score)	34	68.00	29	58.00	63	63.00
3	Low (<58.35 score)	07	14.00	14	28.00	21	21.00

f = frequency, % = per cent, mean= 71.11, S.D.= 12.75

The analysis of Table 1 data reveals a notable distribution of knowledge levels among respondents. A majority (63.00%) of respondents displayed a medium level of knowledge, indicating a reasonable understanding of polyhouse cultivation practices. Conversely, 16.00% of respondents exhibited a high level of knowledge, suggesting a more advanced comprehension of the technology. Notably, 21.00% of respondents demonstrated a low level of knowledge, implying a need for further education and training.

Upon examining Table 1 at the district level, it becomes evident that Bhilwara district has a higher percentage

(68.00%) of respondents with a medium knowledge level compared to Chittorgarh district (58.00%). Conversely, Chittorgarh district had a higher proportion of respondents (28.00%) with a low knowledge level compared to Bhilwara district (14.00%). Additionally, a noteworthy number of respondents in both districts, 18.00% in Bhilwara and 14.00% in Chittorgarh, exhibited a high level of knowledge. The reason for such findings could be because of higher efforts on extension support and training remains to enhance and upscale their level of knowledge so that more farmers will also imitate and replicate the technology and greater number of farmers shall adopt the technology. The similar findings are supported by findings of Kumar *et al.* (2022) and Kumar

et al. (2012) Natwadia et al. (2022).

This discovery can be attributed to the potential for increased efforts in extension support and training. These endeavors are essential for elevating and advancing the farmers' knowledge levels. Consequently, a greater number of farmers will be motivated to emulate and implement the technology, leading to a more extensive adoption of this innovation among the farming community. Similar finding found by Reddy and Reddy (1982) and Meena et al. (2009)

In order to gain a comprehensive understanding of the knowledge held by polyhouse owners, a detailed examination of their knowledge across various aspects was conducted. To achieve this, the mean percent scores for each aspect were computed, and corresponding ranks were assigned. The

knowledge of the respondents was evaluated across fifteen significant aspects of polyhouse technology. The results of the same have been presented in Table 2. Here in the Table 2 different knowledge aspect are given with their mean per cent score and ranks. The information in Table 2 reveals that "knowledge about components of polyhouse" (drip irrigation, fogger system, fertigation system and isolation chamber) was on the first rank with overall MPS 100.00. Remarkably, this ranking was consistently mirrored across both the Bhilwara and Chittorgarh districts, where each district obtained an identical MPS of 100.00 for this category. Whereas extent of knowledge about mulching secured second rank evidenced by an overall MPS of 96.50. This ranking pattern persisted uniformly across both districts, with Bhilwara district attaining an MPS of 96.00 and Chittorgarh district registering an MPS of 97.00 for this specific component, respectively.

Table 2: Aspect-wise Knowledge of farmers about polyhouse vegetable cultivation practices

(n=100)

Sr. No	Aspects	Bhilwara (n ₁ =50)		Chittorgarh (n ₂ = 50)		Total (n=100)	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Type of polyhouse	69.00	X	69.00	X	69.00	X
2	Polyhouse construction related aspects	84.66	VI	71.33	IX	78.00	VIII
3	Components of polyhouse	100.00	I	100.00	I	100.00	I
4	Vegetable can be grown in polyhouse	77.00	IX	75.51	VIII	76.25	IX
5	Production technology	86.13	III	83.73	IV	84.93	IV
6	Climate control	63.21	XIV	54.40	XIV	58.80	XIV
7	Type of insects infestation occurs in polyhouse	81.61	VII	77.60	VII	79.60	VII
8	Pest and pathogen control method	68.00	XI	67.60	XI	67.80	XI
9	Disease control methods	82.00	VI	81.00	V	81.50	V
10	Nematode infestation in polyhouse and its control methods	31.21	XV	25.81	XV	28.50	XV
11	Fertigation in polyhouse	85.33	IV	86.00	III	85.66	III
12	Root media use	67.75	XII	66.75	XII	67.25	XII
13	Mulching	96.00	II	97.00	II	96.50	II
14	Harvesting technique	67.22	XIII	63.00	XIII	65.11	XIII
15	General knowledge	80.85	VIII	80.28	VI	80.57	VI

MPS= mean per cent score

Further examination of Table 2 shows that extent of knowledge about fertigation in polyhouse it stands at third position with MPS 85.66. In Bhilwara it stands at fourth place with MPS 85.33 and in Chittorgarh it stands at third place with MPS 86.00.

Further examination of Table 2 shows that extent of knowledge about production technology, it stands at fourth position with MPS 84.93 and In Bhilwara it stands at third place with MPS 86.13 and in Chittorgarh it stands at fourth place with MPS 83.73.

Regarding knowledge about disease controls method, it stands at fifth position with overall MPS 81.50 and it was also noted that in Bhilwara it stands at sixth place with

MPS 82.00 and in Chittorgarh it stands at fifth place with MPS 81.00. Whereas, knowledge about general knowledge, ranked sixth with overall MPS 80.57 where Bhilwara district ranked it eighth with MPS 80.85 and Chittorgarh district ranked it sixth with MPS 80.28. Knowledge about type of insect's infestation occurs in polyhouse stands at seventh position with MPS 79.60 and it was also noted the similar ranking pattern for both districts, it stands at seventh place with MPS 81.61 of Bhilwara district and MPS 77.60 of Chittorgarh district, respectively.

Knowledge about polyhouse construction related aspects, ranked eighth with MPS 78.00 where Bhilwara ranked it fifth with MPS 84.66 and Chittorgarh ranked it

ninth with MPS 71.33. Whereas, knowledge about types of vegetable can be grown in polyhouse, ranked ninth with MPS 76.25 where Bhilwara ranked it ninth with MPS 77.00 and Chittorgarh ranked it eighth with 75.51 MPS.

The information in Table 2 reveals that knowledge about different type of polyhouse, ranked tenth with MPS 69.00 and it was noted that the similar ranking pattern of both districts, it stands at tenth place with MPS 69.00 of Bhilwara district and MPS 69.00 of Chittorgarh Whereas knowledge about pest and pathogen control method, it stands at eleventh position with MPS 67.80. In both the districts Bhilwara and Chittorgarh it stands at eleventh place with MPS 68.00 and MPS 67.60, respectively. Whereas, about root media use it stands at twelfth position with MPS 67.25. In both the districts Bhilwara and Chittorgarh it stands at twelfth place with MPS 67.75 and MPS 66.75, respectively.

Regarding knowledge about harvesting technique, ranked thirteenth with MPS 65.11 where Bhilwara ranked and Chittorgarh both districts ranked it thirteenth with MPS 67.22 and 63.00, respectively. Whereas, knowledge about climate control it stands at fourteenth position with MPS 58.80. In both the districts Bhilwara and Chittorgarh it stands at fourteenth place with MPS 63.21 and MPS 54.40, respectively.

Regarding knowledge about nematode infestation, ranked fifteenth with MPS 28.50 where Bhilwara ranked and Chittorgarh both districts ranked it fifteenth with MPS 31.21 and 25.81. Thus, from above discussion, it could be concluded that the extent of knowledge of Bhilwara district was 31.21 to 100.00 per cent and extent of knowledge of Chittorgarh districts was 25.81 to 100.00 in all the aspect of polyhouse vegetable cultivation practices. Further, it was concluded that Bhilwara farmers had slightly more knowledge than Chittorgarh farmers about polyhouse vegetable cultivation practices.

Table3 : Relationship between knowledge with personal profile of respondents (n=100)

Sr. No	variables	Correlation co-efficient ('r' value)
X ₁	Age	-0.736 ^{ns}
X ₂	Family type	-0.678 ^{ns}
X ₃	Family size	-1.099 ^{ns}
X ₄	Annual income	3.710 ^{**}
X ₅	Education level	8.310 ^{**}
X ₆	Land holding	3.649 ^{**}

^{**} significance at 5% level,

^{***} significance at 1 % level, ^{ns} Non-significant

Correlation analysis

As per the correlation coefficient (r) analysis, the data presented in Table 3 reveals the correlation of dependent variable which is knowledge on six independent variables concerning to the respondents. The correlation of all the six independent variables such as age, family type, family size, annual income, education and land holding were calculated by correlation coefficient equation. The findings had been presented in Table 3 From Table 3, it can be inferred that there was a negatively non-significant correlation between the age (-0.736^{ns}), family type(-0.678^{ns}) and size of the family (-1.099^{ns}) with knowledge regarding polyhouse vegetable cultivation practices.

The annual income (3.710^{**}), education level (8.310^{**}) and land holding (3.649^{**}) were highly significantly correlated with knowledge of respondents about polyhouse vegetable cultivation practices. These findings are supported by finding of Chauhan *et al.* (2017).

It means that higher educated farmers subjected to adopt polyhouse vegetable cultivation practices more and it depicted that education level play important role in knowledge of farmers about polyhouse vegetable cultivation practices.

CONCLUSION

The above study concluded that knowledge level of farmers about polyhouse vegetable cultivation practices as reported by the respondents, it was found that majority (63.00%) of respondents displayed a medium level of knowledge about polyhouse vegetable cultivation practices. It was noted that the efforts made by various organizations to enhance farmers' knowledge in the study area have been insufficient. This outcome could be enhanced through the implementation of appropriate training programs and an increased frequency of organized workshops for farmers in this region. The study also revealed that the selected polyhouse farmers had high knowledge about components of polyhouse (drip irrigation, fogger system, fertigation system and isolation chamber) with MPS 100.00 and was ranked first, whereas extent of knowledge about mulching, was ranked second with MPS 96.50. However, it was found that polyhouse farmers are having least knowledge about nematode infestation in polyhouse and its control methods with MPS 28.50. Nematode infestation was a big problem for polyhouse owners but they were unaware about it so that why it is recommended that government should provide training to the farmers about identification of nematode infestation and preventive control measures. Further, Annual

income, Education level, and land holding were found highly significantly correlated with knowledge of respondents about polyhouse vegetable cultivation practices.

CONFLICTS OF INTEREST

All authors declare that they have no conflict of interest

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