Knowledge Level of Farmers on Recommended Cultivation Practices of Off-season Vegetable Crops under Low Cost Polyhouse Technology in Assam

Musliha Nasrin[1*], S. Borua[1], R. Borua[2] and B. Deka[2]

[1]Extension Education Institute (NE Region), India.
[2]Assam Agricultural University, Jorhat, India.

Authors' contributions

The research work was carried in collaboration between all authors. All authors read, contributed and approved the final manuscript.

Article Information

Case Study

ABSTRACT

Low cost polyhouse technology enables farmers to cultivate vegetables during Off-season and also fetch higher price to the farmers. Off-season cultivation of vegetable refers to the production of the vegetable before or after of its normal productive season. As the Off-season vegetable cultivation under polyhouse technology need some skills or knowledge, which is not similar to that of normal productive seasons. Therefore, this study is conducted to assess the knowledge level of the farmers on the recommended cultivation practices of some selected Off-season vegetable crops under the low cost polyhouse technology in Assam. The study was carried out in 4 different districts of Assam which was selected depending upon the presence of RKVY (Rashtria Krishi Vikash Yojana) beneficiaries. Amongst them 80 beneficiaries gave their positive respond to the work and hence considered to be the sample for this particular case. Statistical analyses with the collected data were done which includes frequency distribution, percentage calculation, mean and standard deviation along with knowledge test. The major finding of the study shows about (62.50%) of population had medium level of knowledge regarding the polyhouse technology skill. Implementation of this newer

_____

Corresponding author: E-mail: muslihanasrin@gmail.com;

skill will enrich the farmers to develop much more off season crops, rather agricultural sector will contribute to the economy of the nation. This particular case study will help to maintain the flow of the "Off season" crops & meet up the needs of general population.

1. INTRODUCTION

Protected cultivation is a promising technology and hence becoming popular all over the world. There are 115 countries in the world which have undertaken greenhouse vegetable production commercially [1]. China increased its area under protected cultivation to 2.5 m ha which is under plastic covered greenhouses, 9.6 million hectare under plastic mulch, and 0.9 million hectare under low tunnels and floating covers [2].

India is the second largest producer of vegetables in the world i.e. next to China. The total vegetable production of India is 169.064 million tons of its total area 10.106 million ha (as per NHB database, 2015-16) [3]. Presently, area under protected cultivation of horticultural crops is only around 40,000ha and within which, a large portion is mostly situated in the Northern part of India and those region is still not nurtured properly regarding the process of protected cultivation. However, promotion of protected cultivation may help in creating huge self-employments of unemployed educated youths to take a step ahead and built up a strong economy within the world market.

Off-season cultivation of vegetable refers to the production of the vegetable before or after their normal cultivating season. This can be accomplished by using low cost polyhouse technology which can be constructed with least cost and with easily available resources.

Off-season vegetable gives the higher prices to the farmers as it became available to the consumer at every time of the year, whatever the price is, whereas it also ensures the incoming of the foreign currencies by proper transportation of it. Therefore, it is needful for farmers to increase their knowledge level on recommended practices so that they can adopt the vegetable cultivation in a broader commercial scale.

In 1981, the Govt. of India established a National Committee to promote the application of plastics in agriculture. This committee NCPAH (National Committee in Plasticulture Application in Horticulture has established 22 Precision Farming Development Centers throughout the country. Out of which two centers have been established in the North Eastern Region including one at Guwahati and another at Imphal [4].

Government provides subsidy to farmers to grow crops under cover. Recently central government initiated National Vegetable Initiative for Urban Clusters in 2011-12, the scheme which help farmers to get year round production of vegetables in greenhouse.

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 on recommended cultivation practices of selected Off-season vegetable crops under low cost polyhouse technology in Assam.

2. LITERARY REVIEW

Off season cultivation of vegetable is more remunerative which enforce farmers to go for commercial cultivation. Srivastava (2000) reported that in different European countries, the yield of the greenhouse tomatoes was obtained in the range between 63 to 145t/ha. He also reported that at IARI, New Delhi, an average of 100t/ha yield had been obtained and in high rainfall areas of Jorhat tomato yields were 60-70 per cent high under poly rainshelter than under open field condition [5]. Also an experiment conducted in Assam Agricultural University, Jorhat reported that Off-season tomato cultivation could be profitably done in Jorhat, Assam condition during rainy summer under plastic cover [6]. Chandra [7] in his study reported that plastic rain shelter cum greenhouse is very common in every western countries to achieve maximum net return for commercial vegetable production. Giesenburg and Stewart [8] reported that the UV stabilized polyethylene film and PVC protect the crop from adverse environmental condition. Besides promotion of earliness, the use of plastic covers raises soil and air temperature and also protects crops from rain, snow and wind. In addition to these, they

have other advantages like improved seed bed condition, better seed germination, higher yield and quality. Antil [9], Liao [10] reported that vegetables planted under plastic houses were of better appearance due to less damage by wind and rain. The use of plastic film for covering the greenhouse structure has opened up new avenues for research. Bualek et al. [11] reported that plastic greenhouse could be successfully used to create a desirable microclimate for early and off-season production of vegetables. Takakura [12] described the usefulness of plastic greenhouse for providing vegetables like green pepper, tomato, cucumber etc, by providing control environmental condition and protection from diseases, insects and rains. Deka [13] revealed that 60,000 and 53,000sq.m area under polyhouse and plastic net house, respectively, for off season production was covered under the RKVY scheme in Assam.

Knowledge is the information about an idea or fact posses or known by an individual. However, various authors and scholars conceptualize it in various ways as stated below:

Bloom et al. [14] stated that those behavior and test situation which emphasize reminding either by recognition either by recognition or by recall of ideas, materials or phenomenon. Reddy and Reddy [15] while studying the impact of national demonstration project in Rongaredi district of Andhra Pradesh measured the level of knowledge of participant farmers by comparing with that of the non participant farmers who were not exposed to National Demonstration project.

3. METHODOLOGY

The study was carried out in the state of Assam. Samples are chosen from 4 different districts of Assam & were selected accordingly where maximum beneficiaries of RKVY (Rashtriya Krishi Vikas Yojana) are existed. The districts were Jorhat, Dibrugarh, Sonitpur and Kamrup. 20 respondents from each district were selected to prepare the total sample size 80. Statistical tools are employed to analyze the data which includes frequency distribution, percentage, mean, standard deviation and knowledge test.

The criterion is to select the samples according to the purpose of the study, in which the subjects are gone through some of the training or awareness program regarding protective cultivation.
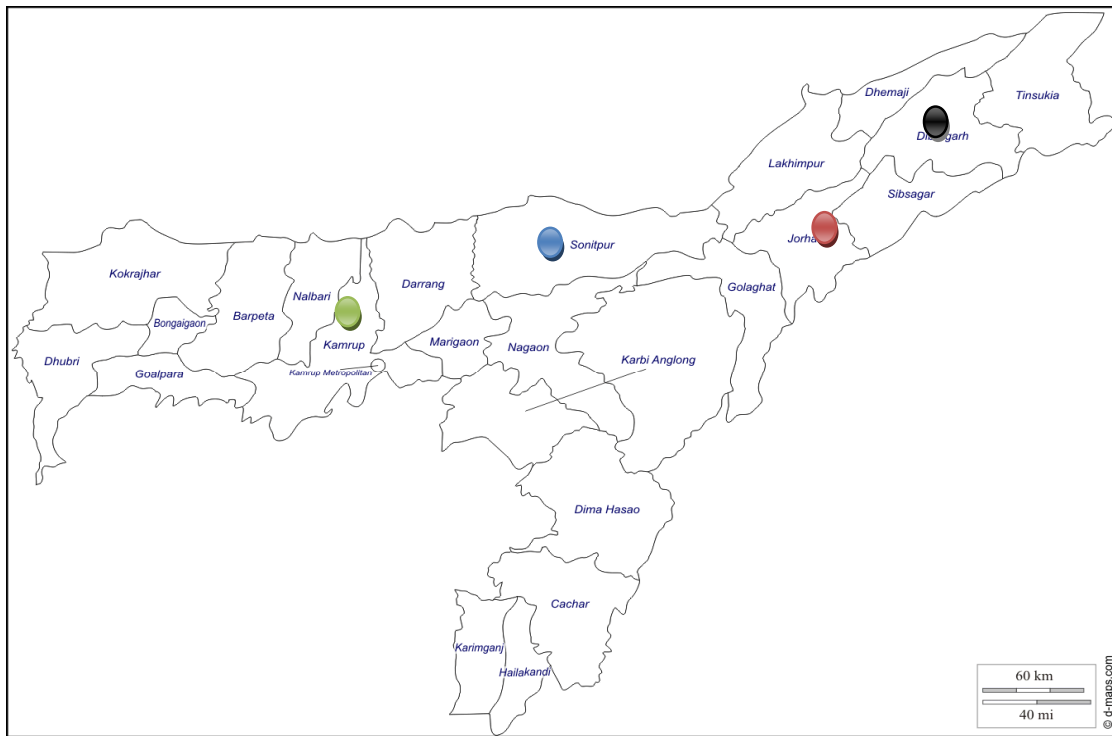

Fig. 1. A map showing the research areas

3

3.1 Concept of Knowledge

It refers to the quantity of scientific information known by the respondent about the low cost polyhouse and recommended package and practices of selected off season vegetables. Bloom et al. [14] defines knowledge as "those behavior and test situation which emphasize and remembering either by recognition or recall of idea, materials or phenomenon". In the present study, knowledge was conceptualized as remembering, materials, phenomena, methods or procedure as a result of exposure.

3.2 Construction of Knowledge Test

Knowledge level of the respondent in the present study was measured with the help of knowledge test constructed and standardized by Barman (1998) for the purpose. While administrating the final knowledge test, respondent score "1" was assigned for a correct answer and score "0" was assigned for an incorrect answer. Thus, the total score on the test had a theoretical range of 0 to 27. On the basis of the score obtained by the respondents they were categorized into 3 following categories (see Table 1).

4. RESULTS AND DISCUSSION

It is observed from the Table 1, that majority of the respondents 62.50 per cent possess medium level of knowledge, followed by 21.25 per cent respondents having high level and 16.25 per cent
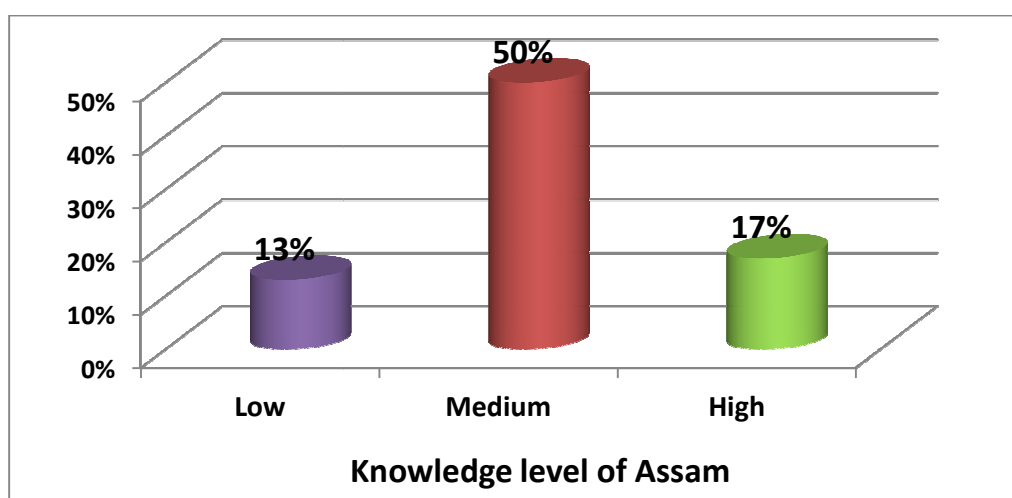
having low level of knowledge. Similar findings were reported by Surender [16].

Table 1. Decided ranges of knowledge level test of the sample considering different range of knowledge and depending upon it following categories are developed

Category	Range
Low	Below ($\bar{X}$ –S.D.)
Medium	Between ($\bar{X}$ –S.D.) and ($\bar{X}$ + S.D.)
High	Above ($\bar{X}$ + S.D.)

Considering the knowledge level of respondents covered under the four districts of Assam, the knowledge level that was measured is found to be relatively at a satisfactory level in order to apply in their own farms for Off-season cultivation of vegetables under low cost polyhouse technology.

The reason for such a finding could be because of the fact that the entire package of practices as well as the construction of the low cost polyhouse is not a very complicated technology for farmers to understand and apply in their own field condition to gain higher profits in a unit area of land. However, scope 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. Similar findings found by Reddy and Reddy [15], Meena et al. [17], etc.

Fig. 2. Shows the result of knowledge test, where violet coloured bar depicts the people with lower knowledge level, red coloured bar shows the range of people with medium knowledge & green coloured bar shows the higher level of knowledge in the sample size

Table 2. Frequency and percentage distribution of all the respondents according to the knowledge level in Assam N=80

Category	Score range	Frequency	Percentage	Mean	S.D
Low	Below 6.7	13	16.25%		
Medium	6.7-16.57	50	62.5%	11.63	4.93
High	Above 16.57	17	21.25%		
Total		**80**	**100**		

5. CONCLUSION

From this particular study it may be concluded that samples with moderate level of knowledge are majority in numbers (62.50% of total population), than that of the samples consuming higher (21.25% of total population) and lower level (16.25% of total population) of knowledge.

Though irrespective of sufficient knowledge in some samples, still lack and insufficiency belong to the same group of people considering different categories which has been aforesaid in this study. So it can be said that to improve the quality and quantity of different agricultural sectors of Assam better knowledge awareness campaigns or training programs needed to be organized, to built the proper ratio of gathering knowledge & implementation if it. On the contrary this case may widen up several propositions of increasing off-season crop cultivation within the whole nation and this way of process may develop the commercial scale in front of the world to gather maximum profit.

Government and non-government agencies should take initiatives to create awareness campaign about improved methodology, encouraging farmers to join and get motivated to learn these techniques for their future betterment.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Sabir N, Singh B. Protected cultivation of vegetables in global arena: A review. Indian Journal of Agricultural Sciences. 2013;83(2):123-135.
2. Anonymous. Working group on development of protected cultivation in Haryana, Govt. of Haryana report, CCS HAU, Hisar; 2005.
3. Government of India 2015. National Horticulture Board Database.
4. Anonymous. National Committee in Plasticulture Application in Horticulture, Promotes Plasticulture technique in farming. Retrieve on June 24, 2016. Available:www.agricultureinformation.com
5. Srivastava BK. Vegetable production in polyhouse. Indian Farmers Digest. 2000;33(3):9-10.
6. Shadeque A, Saikia S. Profitable raising of vegetable crop under plastic greenhouse cum rain shelter Bull. AAU. Jorhat; 1992.
7. Chandra P. Applications of greenhouse technology. In: Proceedings of the summer in summer institute on greenhouse design and environmental control. Technical Report CIAE/EME/85/35. Central Institute of Agricultural Engineering, Bhopal. 1985;21-31.
8. Giesenburg C, Stewart K. Field production under partial protection with plastic tunnels. In: The tomato crop, a scientific basis for improvement. Ed. Atherton, J. C. and Rudich J. 1989;540-541.
9. Antil DN. The use of low level plastics in horticultural field crops. In: Proceedings of conference on plastic in the Nintees, British Agricultural and Horticultural Plastic Association; 1988.
10. Liao FS. Study on the production and marketing system of vegetable grown in plastic houses in the suburban areas of Taipei. In: Paper presented in the symposium of horticultural production under structure II. (In Chinese unpublished); 1989.
11. Bualek S, Suchiva K, Boonariys S. Study of ageing of polyethylene films for the construction of greenhouse in Thailand. In: Proc. XI, ICPA, New Delhi, India. 1990;107-144.
12. Takakura T. Controlled environment agriculture. In: Proc XI, ICPA, New Delhi, 1990;3-10.
13. Deka B. Role of Precision Farming Development Centres in North Eastern States; 2014.

14. Bloome. Bejamin, Hill, Furst, Krthwohl. R. Devid.. Taxonomy of educational objectives, the cognitive Domain, Orient Loongmars, New York; 1956.

15. Reddy PR, Reddy GB. Impact of National Demonstration on knowledge level and Adoption Behavior of participant and Non-participant farmers in Rangereddi district of Andhra Pradesh, Mysore J. of Agril Science. 1982;XVI(3):351-353.

16. Surender AR. A study of knowledge and adoption behavior of small and big farmers growing tomato in Bangalore district. Mysore J. Agric. Sci. 1980;XVI(3):360.

17. Meena RR, Sing J, Verma AK. Farmers knowledge of feeding practices of dairy Animals in Jansi Districts. Indian Res. J. Ext Edu. 2009;9(1).

_____

Peer-review history:
The peer review history for this paper can be accessed here:
http://sciencedomain.org/review-history/22442