

Assessment of the Knowledge Level of Cabbage Growers for an Enhanced Production Technology

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Authors' contributions

This work was carried out in collaboration among all authors. Author IR designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author QJAP managed the analysis of the study and guided during the study program. Authors SAA and FF managed the literature sites. All authors read and approved the final manuscript.

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ABSTRACT

Cabbage is one of the most popular vegetables in the world because of its adaptability to a wide range of climatic conditions and soil type, ease of production and storage, and its food value. Commercial cultivation of Cabbage is very successful due to high market demand and its medicinal importance to treat gout, deafness, headache and hangovers in the early days. The present study aimed to assess the Knowledge level of cabbage growers towards the recommended package of practices in Budgam District of Jammu and Kashmir, India during the year 2017-18. Ex- post- facto research design was adopted. The study was carried out in purposively selected Zone Chadoora of district Budgam of Jammu and Kashmir State, as having maximum area under cabbage crop. A sample of 120 cabbage growers was selected by proportionate allocation method from randomly selected six villages. The data was collected with the help of a well structured interview schedule. Data derived from the growers was analyzed by employing suitable statistical methods. Twelve independent variables were categorized and studied in relation to dependent variable i.e. knowledge

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level about cabbage cultivation practices. Majority of the growers had medium knowledge level regarding the recommended package of practices for cabbage cultivation given by SKUAST-Kashmir. Correlation analysis revealed that education, occupation, operational land holding, area under cabbage, experience in cabbage cultivation, net income, mass media exposure and scientific orientation had significant relationship with the knowledge level of cabbage growers whereas the remaining independent variables starting with age had a negative and significant relationship with the knowledge whereas, family size, innovation proneness and extension contact had no significant relationship with the knowledge level of cabbage growers. The identified gaps in farmers practices and recommended cultivation practices may help to give directions to the field level extension workers to manipulate the appropriate factors so as to increase the adoption level. The results of the study will be useful to extension personnel and administrators so that they could know the extent of knowledge and adoption behaviour of cabbage growers. The results could also be used to bridge the gap through intensive training and organizing of other extension activities.

Keywords: Cabbage growers; correlation; knowledge; India.

1. INTRODUCTION

It is imperative to attach more significance for the production of vegetable crops in India being predominantly a country of vegetarians. Cultivation of vegetables and fruits is a viable commercial proposition. With the introduction of liberal trade policies, prospects for export of fruits and vegetables have improved. Vegetables provide a good source of income to the growers and play an important part in human nutrition. They are quick growing and yield immediate returns to the growers and they have a vital role to play on the food front as they reduce the demand for cereals [1]. Moreover, due to shrinkage of agriculture land caused by urbanization and industrialization, cultivation of vegetable crops is more economic. Vegetable crops also play an important role in diversification of agriculture and help conserve the ever-depleting underground water [2]. Among the cole crops only cabbage (*Brassica oleracea var. capitata*) is grown in winter within India and grows best in cool moist climate and is very hard to frost. In hot dry atmosphere, its quality becomes poor and much of its delicate flavour is lost. Its germination is best at a soil temperature of 12.7 to 15.5°C. It is grown mainly as *rabi* crop during winter but in certain parts (Maharashtra, Jammu and Kashmir), it is grown as *kharif* crop as well. Cabbage is annual when grown for consumption purpose and biennial when grown for seed purpose. The edible portion of cabbage is head. Cabbage is grown over the world with the production of 71803269 tons and China is the leading producer of cabbage having a production of 33881515 tons. India ranks 2nd in the production of cabbage with an area of 403 million hectare and production of 8755000 tons [3]. In

India, West Bengal ranks 1st having an area of 79.13 million ha and production of 2288000 tons of Cabbage. Jammu and Kashmir ranks 17th having an area of 2000.49 ha and production of 114000.70 tons of cabbage [4].

The state of Jammu and Kashmir has a potential to exploit productivity of vegetables to the tune of 40tons/ha. District Budgam produces the maximum portion of cabbage among all the districts of Kashmir valley having an area of 406 hectare under cabbage and production of 99700 Q [5].

2. MATERIALS AND METHODS

The present study was carried out purposely in district budgam on the basis of maximum area and production under cabbage cultivation. One agriculture sub-division Chadoora was selected purposely out of four sub-divisions in district budgam. Agricultural sub division Chadoora consists of 7 Agricultural zones; only one Agricultural zone Chadoora having maximum area and production under Cabbage cultivation was selected purposely. 6 villages were selected randomly namely:- Bugam, Wathoor batpora, Dawlatpora, Nowbugh, Gowherpora, and Porwara with having maximum number of cabbage growers for the present study.

2.1 Sample Selection and Assessment

A sample of 120 cabbage growers was selected by proportionate allocation method from randomly selected six villages. A list of knowledge items was prepared by discussing with experts from vegetable science, agricultural extension and referring to the package of

practices book published by the Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Shalimar. Each practice was framed in a question form to obtain the response from the growers. The answers to the question were quantified by giving 2 score to full knowledge answer, 1 score for partial knowledge and zero score for no knowledge answer. The test constituted 19 knowledge questions. The questions covered full range of cultivation practices beginning from variety selected to the appropriate time of harvesting of particular variety obtained. Thus, the maximum possible score was 38 and the minimum was zero. The summation of scores of the correct answers for a particular grower indicates his knowledge level about improved cabbage cultivation practices. The growers were grouped into three categories using mean and standard deviation as measure of check. Coefficient of Correlation (r value) was worked out to know the relationship between independent variables such as age, education, family size, occupation, net income, operational land holding, Area under cabbage crop, experience in cabbage cultivation, mass media, extension contact, innovation proneness and scientific orientation with the knowledge level of cabbage growers.

2.2 Designing of Interview Schedule

In the present study the device used for data collection was well structured interview schedule. The schedule was developed for gathering information of independent variable, dependent variable, marketing and constraints faced by the Cabbage growers. The interview schedule was strictly formulated in accordance with the set objectives and in consultation with experts from the division of Vegetable science, Agriculture economics, KVK's and Agriculture extension functionaries of the Agriculture Department. The Part-A of the interview schedule consisted of profile, socio-personal characteristics of the growers. Part-B includes questions related to the recommended package of practices by Cabbage growers. Part-C consisted of open ended constraints faced by Cabbage growers. Part-D consisted of marketing system of Cabbage growers.

2.3 Pre-testing of Interview Schedule

The interview schedule was pretested before being finalized using over 10 growers not included in the sample were selected. The necessary modifications were made in light of

offered suggestions to make the interview schedule more appropriate, effective and useful.

The researcher personally collected the data by interviewing the growers through the well structured interview schedule. The data was collected at the leisure time of the growers. Each grower was met personally so that investigator can get firsthand information. The response of each grower was recorded in the interview schedule separately. The growers were at ease and expressed their opinion freely, fairly and frankly as friendly atmosphere was maintained during the interview.

Every effort was kept to check and cross check the data collected from all the sampled growers.

2.4 Data Collection

Personal Interview of the growers through the well structured interview schedule was used for data collection. The data was collected at the leisure time of the growers. Each grower was met personally so that investigator can get first hand information. The response of each grower was recorded in the interview schedule separately. The growers were at ease and expressed their opinion freely, fairly and frankly as friendly atmosphere was maintained during the interview. Every effort was kept to check and cross check the data collected from all the sampled growers.

2.5 Compilation and Working of Data

After collection of data from the growers, scores were given to responses collected from them which were later tabulated, classified and quantified. Suitable statistical tools were used for the analysis of data and the findings that emerged out of the data were interpreted based on the objectives; they were discussed accordingly by drawing necessary inferences and conclusions.

2.6 Statistical Procedures

The following statistical tests and measures were used for the analysis of the data.

2.7 Arithmetic Mean

This was used to compare the growers in respect of their dependent variables. The arithmetic mean is the sum of scores divided by the number of growers (Equation 1).

$$\bar{x} = \frac{\sum x}{n} \tag{1}$$

Where,

\bar{x} = Mean

$\sum x$ = sum of scores

n = Number of growers

2.8 Standard Deviation

Standard deviation is the square root of the mean of the sum of squares of the deviation taken from the mean of the distribution.

$$\sigma = \sqrt{\frac{1}{n} \left(\sum x^2 - \frac{(\sum x)^2}{n} \right)} \tag{2}$$

Where,

σ = Standard deviation

$\sum x^2$ = Sum of squared deviations from the mean

n = Number of items

2.9 Frequencies (f) and Percentages (%)

Some of the data were also subjected to and interpreted in terms of their frequencies and percentages. Wherever, necessary to know the distribution pattern of growers according to variables and for standard deviation by calculating the number of individuals that would be in given category if the number of cases were 100.

2.10 Difficulty Index [6]

It indicates about how much a statement is difficult and is expressed in terms of correct response obtained from a particular question and worked as below:

$$P = \frac{\text{No.of correct responses for the } i^{\text{th}} \text{ question}}{\text{Total No.of growers}} \times 100 \tag{3}$$

For the present study, the items with ‘P’ value ranging from 25 to 85 were retained finally.

2.11 Discrimination Index [6]

The use of this index is the next step in the process of selection of questions for knowledge

test. It measures the distinguishing difference of a question between high and low groups.

Discrimination index of i^{th} question = No. of correct responses in high group / Number of correct responses in low group / Total no. of growers in criterion group.

Questions having Discrimination index of above 0.2 were selected. The test thus prepared consisted of 19 items. The answers to the question were quantified by giving 2 score to full knowledge answer, 1 score for partial knowledge and zero score for no knowledge answer.

2.12 Data Analysis

This study analysed data collected with descriptive statistics such as frequencies and percentages supported with data tables for clarity [7,8].

In addition, Pearson’s Coefficient of Correlation (r value) was worked out to know the relationship between independent variables such as age, education, family size, occupation, net income, operational land holding, Area under cabbage crop, experience in cabbage cultivation, mass media, extension contact, innovation proneness and scientific orientation with the knowledge level of cabbage growers.

3. RESULTS AND DISCUSSION

Mean and standard deviation were calculated and growers were categorized as low medium and high based on their overall knowledge level. The distribution of growers is presented in Table 1.

It could be inferred from the Table 1 that 65.84 per cent of the growers were having medium level of knowledge, whereas 24.16 per cent and 10.00 per cent of the growers were having low and high level of knowledge of recommended package of practice respectively. This might be due to the fact that majority of them were literates with medium level of education about innovation proneness, scientific orientation, extension contact and thus were aware regarding the various practices recommended by Skuast-K. The results are in line with the findings of Murali et al. [9].

Table 1. Distribution of growers on the basis of their knowledge level (N=120)

S. no.	Variable	Categories	Growers	
			Frequency	Percentage
1.	Knowledge	Low (below 23.6)	29	24.16
		Medium (between 23.6-31)	79	65.84
		High (Above 31)	12	10.00
			Mean: 27.3, S.D: 3.70	

Table 2. Correlation coefficient between socio-economic profile with the knowledge level of cabbage growers, N=120

S. no.	Variable	Correlation coefficients ('r' Value)	'p' Value
1.	Age	-0.156	0.022
2.	Education	0.183	0.035
3.	Family size	0.213	0.126
4.	Occupation	0.174*	0.033
5.	Operational Land holding	0.294**	0.000
6.	Area under Cabbage	0.207*	0.023
7.	Experience in cultivation of cabbage	0.164*	0.025
8.	Net income	0.140*	0.126
9.	Mass Media Exposure	0.189*	0.048
10.	Innovation proneness	0.161	0.085
11.	Extension contacts	0.175	0.089
12.	Scientific Orientation	0.118*	0.027

**Significant $p \leq 0.01$ level of probability and *Significant $p \leq 0.05$ level of probability

3.1 Association and Contribution of the Socio Economic Profile of Cabbage Growers with Their Knowledge Level

To study the association and contribution of profile of farmers with their knowledge level about the recommended package of practices, correlation analyses was carried out and presented in Table 2.

From Table 2, it is evident that the independent variables education, occupation, operational land holding, area under cabbage, net income, experience in cabbage cultivation, mass media exposure, and scientific orientation had significant correlation with the knowledge level of growers whereas age was negative and significantly correlated with the knowledge level but family size, extension contacts and innovation proneness had no correlation with knowledge level of growers.

Education had a significant correlation with the knowledge level of cabbage growers as the growers were educated up to middle level and had medium knowledge about the recommended package of practices. The results are in line with the results of Iqbal [10], Naik [11] and Shinde [12].

Occupation had a significant correlation with the knowledge level of cabbage growers as majority of the growers had agriculture as their main occupation and therefore they had medium level of knowledge about the agricultural activities. The results are in line with the results of Gurjar [13].

Operational land holding had a significant correlation with the knowledge level of cabbage

growers. The reason might be that the growers had landholding of 11-20 kanals and wanted to increase the value of land by knowing about the various practices required for higher production. The results are in line with the results of Jadhav [14], Shinde [15] and Gurjar [13].

Area under cabbage crop had a significant correlation with the knowledge level of cabbage growers. The reason might be that the growers had grown a diverse number of vegetable crops and had knowledge about the recommended package of practices. The results are in line with the results of Prakash [15].

Experience in cabbage cultivation had a significant correlation with the knowledge level of cabbage growers as growers had medium education level and had medium awareness regarding the recommended package of practices. The results are in line with the results of Krishna [16], Janardan [17] and Naik [11].

Net income had a significant correlation with the knowledge level of cabbage growers. The reason might be due to short duration crop of cabbage and the same piece of land gets ready for growing of other crop. The results are in line with the results of Jadhav [14], Shinde [12] and Ambavane [18].

Mass media had a significant correlation with the knowledge level of cabbage growers. The reason might be that the farmers had exposure to radio and television and knew about the various practices of cultivation. The findings are in line with the findings of Chandra [19], Latha [20], Hiremath [21] and Devarani [22].

Scientific orientation had a significant correlation with the knowledge level of cabbage growers.

The reason might be that the farmers had medium education level and wanted to have the knowledge about the scientific method of cultivation. The results are in line with the results of Naik [11].

Age had a negative and significant correlation with the knowledge level of cabbage growers. The reason might be that the farmers were middle aged.

Family size is non-significant with the knowledge level of cabbage growers. The reason might be that other member in the family didn't show interest in agricultural activities. The findings are in line with the findings of Panchbhai [23].

Extension contact is non-significant with the knowledge level of cabbage growers. The reason might be that the agricultural extension centres or Krishi Vigyan Kendra (KVK's) were far off from the study area. The results are in line with the results of Anuradha [24] and Singh [25].

Innovation proneness is non- significant with the knowledge level of cabbage growers. The reason might be that though the growers wanted to know about the scientific ways of cultivation but they were not ready to adopt them instantly. The results are in line with the results of Parihar [26] and Makashree [27].

4. CONCLUSION

65.84% of the growers had medium level of knowledge, whereas, 24.16% and 10.00% of the growers were having low and high level of knowledge, respectively. Furthermore, the correlation coefficient revealed that education, occupation, operational land holding, area under cabbage, experience in cabbage cultivation, net income, mass media exposure and scientific orientation had significant relationship with the knowledge level of cabbage growers whereas remaining independent variables age had a negative and significant relationship with the knowledge, family size, innovation proneness and extension contact had no significant relationship with the knowledge and adoption level of cabbage growers. This study therefore suggested that the increase in educational status leads to knowledge on production technology of cabbage crop or vegetables in general with increased level of income. This gives better scientific orientation, innovation proneness and exposure of growers to the scientific cultivation practices.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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