



Socio-economic Characteristics and Their Correlation with the Knowledge Level of High Density Apple Growers of Kashmir Valley

**Noor ul Islam Wani^{1*}, A. H. Hakeem¹, M. A. Dar¹, Khalid Rasool²,
Rihanna Habib Kanth³ and Showkat Maqbool⁴**

¹*Division of Agricultural Extension and Communication, Faculty of Agriculture, SKUAST- K Wadura, India.*

²*Division of Horticulture, Faculty of Agriculture, SKUAST- K Wadura, India.*

³*Division of Agronomy Faculty of Agriculture, SKUAST- K Wadura, India.*

⁴*Division of Agricultural Statistics, Faculty of Agriculture, SKUAST- K Wadura, India.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2019/v35i330184

Editor(s):

(1) Dr. Zhao Chen, Department of Biological Sciences, College of Agriculture, Forestry and Life Sciences, Clemson University, USA.

(2) Dr. Teresa De Pilli, Assistant Professor, Department of Science of Agriculture of Food of Environment (SAFE), University of Foggia, Via Napoli, Italy.

Reviewers:

(1) John Walsh, RMIT University, Vietnam.

(2) Borislav Kolaric, University Union - Nikola Tesla, Serbia.

(3) Adijah Olubandwa, Egerton University, Kenya.

Complete Peer review History: <http://www.sdiarticle3.com/review-history/49168>

Original Research Article

Received 10 March 2019

Accepted 16 May 2019

Published 17 May 2019

ABSTRACT

The study was carried out in Bandipora, Baramulla, Kupwara, Pulwama and Shopian of the Kashmir valley owing to the majority of high density Apple growers in these districts. A total number of 200 respondents having high density apple orchards on an area of one 0.05 hectare and above were selected for the study. A well-structured interview schedule was constructed for the collection of primary data from the respondents. Data derived from the interviewees was analyzed by using suitable statistical methods. Socio-economic characteristics of the high density apple growers were studied and their relation with the Knowledge level of the respondents was found out. Out of a total

of 330 high density apple growers, 200 respondents were selected for the present study through stratified random sampling procedure. Majority of the respondents were having medium knowledge level regarding the production technology in high density apple. Correlation analysis revealed that education, economic motivation, mass media exposure, scientific orientation and extension contacts had significant relationship with the knowledge level of the respondents whereas the rest of the independent variable like age, experience and landholding had non-significant relationship with the knowledge level of the respondents.

Keywords: High density apple; independent variables; scientific orientation; knowledge.

1. INTRODUCTION

In India cultivation of apple is mainly confined to the states of Jammu and Kashmir, Himachal Pradesh, Uttarakhand. In India the area under apple is 277 thousand hectares with a production of 2521 thousand metric tonnes [1]. The apple fruit is the backbone of economy in Jammu and Kashmir State and has a great potential to ameliorate the condition of rural people. The area and production of Apple in Jammu and Kashmir is 162971 hectares and 1726834 Metric tonnes respectively [2].

Over the past few years, Apple production has been quite stagnant and the land under apple crop has not expanded to the extent that it would meet the growing demand for Apple. At the same time, the land under this precious crop has been continuously shrinking due to the growing pressure of population on both the Agricultural and Horticultural land. Therefore, in order meet the growing demand for Apple, its production and productivity has to be improved significantly which can be made possible only through High Density Plantation (HDP) system. High density planting (HDP) means to increase the plant

production per unit area for increasing the production of fruit crops [3].

High density Apple plantation aims at doubling the farmers' income by increasing the productivity per unit area thereby increasing the net returns from Apple. High Density Plantation System was introduced in Kashmir for the first time in 1989-90 as Indo -Bulgarian Project in village Zainapora, (Shopian). But due to unfavourable situation in the valley, the experts from Bulgarian Govt. left the project half-way without achieving the required goal and finally, it was completely sponsored by State Govt. with the nomenclature as Advanced Centre for Horticulture Development Zainapora. Over the past few years the state government has been enthusiastic and has shown great deal of interest in reviving and promoting the High density Plantation in Kashmir [4].

Keeping in view the broader prospects of HDP orchards in respect of land use, planting density, yield improvement and management practices used, the present research was carried out in the Kashmir Valley to to study the "Knowledge of Apple growers about the production technology of the High Density Plantation (HDP) in Apple".

2. MATERIALS AND METHODS

2.1 Sampling Procedure

Stratified Random Sampling method was used.

District	Total no. of high density apple growers in each district (N_i)	Sample size to be drawn from each district (n_i)	Total no. of high density apple growers(N)	Sample size to be drawn for the study (n)
Bandipora	$N_1=93$	$n_1= N_1 \times n/N=57$	330	200
Pulwama	$N_2=88$	$n_2= N_2 \times n/N=53$		
Baramulla	$N_3=70$	$n_3= N_3 \times n/N=42$		
Shopian	$N_4=51$	$n_4= N_4 \times n/N=31$		
Kupwara	$N_5=28$	$n_5= N_5 \times n/N=17$		

2.2 Locale of the Study

Baramulla, Bandipora, Kupwara, Pulwama and Shopian districts of the Kashmir valley were selected for the present study as majority of the High Density apple growers are located in these districts.

2.3 Selection of the Respondents

A list of high density apple growers was obtained from the office of Chief Horticulture officers and District Horticulture officers of the concerned districts. Apple growers who had High density apple orchards on an area of one kanal and above were retained for the present study.

From this list, a proportionate random sample of 200 High Density Apple growers was retained for the present study.

2.4 Variables and Their Empirical Measurement

Based on the review of literature and opinion of the experts, the variables for the study were selected. The variables, which were found to have relevance with the present investigation were included in the study.

2.5 Socio-economic Characteristics and Their Empirical Measurement

S.No.	Variables	Empirical measurement Independent Variables
1.	Age	Chronological age of the respondents
2.	Education	Number of years of formal schooling
3.	Land holding	Total land possessed by the respondent in Kanals
4.	Experience in HDP	Number of years completed by the respondent in High Density Apple cultivation at the time of interview.
5.	Extension contacts	It has been measured by the frequency of contacts of respondents with various extension personnel.
6.	Mass media exposure	It has been measured with the use of various information sources by the respondents.
7.	Scientific orientation	Measured with scale developed by Raja (1998) with suitable modifications.
8.	Innovative proneness	Moulik's (1965) "Self-rating innovative proneness scale" as used by Sakharkar (1995) and Shashidhara (2006)

2.6 Tools for Data Collection

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 and dependent variables.

Pretesting of Interview Schedule: The interview schedule was pretested before finalizing over some 10 non-target respondents from Wadura village of Baramulla district.

2.7 Method of Data Collection

The data was collected from August 2017 to October 2017 and researcher personally administered structure interview schedule to the respondents. The questions were simple and brief, asked in local language i.e. Kashmiri. Each respondent was met personally so that investigator can get firsthand information. The response of each respondent was recorded in the interview schedule separately. Every effort was made to check and cross check the data collected from all the sampled respondents.

2.8 Data Collection

All the selected respondents were personally investigated by the researcher and the data was recorded directly on the schedule, which enabled the researcher to get first-hand information and gave an opportunity to observe their reactions. The respondents were at ease and expressed their opinion freely, fairly and frankly as friendly atmosphere was maintained during the interview.

2.9 Data Analysis Procedure

Scores were given to responses collected from respondents and then accordingly tabulated. Suitable statistical tools were used and findings emerged out of the data analysis were interpreted based on the study objectives and accordingly discussed and necessary inferences, conclusions were drawn.

2.10 Statistical Procedures

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

2.11 Arithmetic Mean

This was used to compare the respondents in respect of their dependent variables. The arithmetic mean is the sum of scores divided by the number of respondents.

$$\bar{X} = \frac{\sum X}{n}$$

Where,

\bar{X} = Mean

Σx = sum of scores

n = Number of respondents

Frequencies (f) and Percentages (%): Some of the data were also subjected to and interpreted in terms of their frequencies and percentages.

Correlation Co-efficient (r): This tool was used to find out the significant relationship, if any between scores of the independent variables and the scores of the dependent variable of the sample respondents. By using the following formula:

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\sum x^2 - \frac{(\sum x)^2}{n}}} \sqrt{\sum y^2 - \frac{(\sum y)^2}{n}}$$

Where,

r = Co-efficient of correlation between x and y

$\sum X$ = Sum of independent variable x

$\sum y$ = Sum of dependent variable y

$\sum x^2$ = Sum of squares of x variable

$\sum y^2$ = Sum of squares of y variable

n = Size of the sample

The significance of the correlation co-efficient was tested by using the following

formula:

$$t = \frac{|r|\sqrt{n-2}}{\sqrt{1-r^2}}$$

The computed 'r' values were then compared with the table values and coefficient of correlation at 1 and 5 per cent level of significance was tested.

3. RESULTS AND DISCUSSION

The prime objective of the investigation was to know the knowledge level of recommended package of practices by farmers in High Density

Apple. Keeping in view the specific objectives of the investigation, the data was collected and processed through the tools of statistical analysis. The results are presented as under:

3.1 Socio-economic Characteristics

Age: The data presented in Table 1 depicts that majority (58%) of the respondents were "middle aged". Whereas, 39.50 were "old aged" and only 2.50 percent of the respondents were "young."

Education : From Table 1, it is clear that only a small number (13.00%) of the respondents had no formal education whereas 87.00 percent of the respondents had a formal education and out of 87.00 percent educated respondents, 77.00 percent had education level of middle and above and only 10.00 percent respondents were having education up to primary level.

Experience in HDP cultivation: It is clear from Table 1 that, majority (84.50%) of the respondents had a medium level experience in HDP cultivation, while as, only 14.50 percent of respondents had high experience in HDP cultivation. It is interesting to see that only 1.00 percent of the respondents had low experience in HDP cultivation.

Total land holding: The data in Table 1 reveals that, more than half (55.50%) of the respondents had landholding measuring from 0.81-2.0 ha. Whereas, 35.00 per cent of the respondents had the land holding measuring 0.2-0.80 ha and only 9.00 per cent of the respondents had landholding above 2.0 ha.

Land under traditional apple: Data from Table 1 reveals that majority (73.00%) of the respondents had traditional orchard on an area ranging up to 0.80 ha whereas only 25.00 percent of the respondents had traditional orchard on the area ranging from 0.80-2.0 ha and only 2.00 percent of the respondents had traditional orchards on an area of 2 ha and above.

Land under HDP apple: The data in Table 1 reveals that 73.50 percent of the respondents had established HD apple orchard over an area ranging from 0.05-0.30 ha whereas 22.50 percent of the respondents had established HD apple orchard over an area ranging from 0.31-0.60 ha and only 4.00 percent of the respondents had established HD apple orchards on an area of 0.60 ha and above.

Table 1. Distribution of respondents on the basis of socio-economic characteristics

			N=200
S.no.	Characteristics	Frequency	Percentage
A. Age (in years)			
i.	Young (18-30)	05	2.50
ii.	Middle age (31-50)	116	58.00
iii.	Old age (above 50)	79	39.50
B. Educational qualification			
		Frequency	Percentage
i.	Illiterate	26	13.00
ii.	Primary	20	10.00
iii.	Middle	50	25.00
iv.	Matric	36	18.00
v.	10+2	44	22.00
vi.	Graduate	13	6.50
vii.	Post graduate and above	11	5.50
C. Experience in HDP cultivation			
		Frequency	Percentage
i.	Low(<1.65)	02	1.00
ii.	Medium(1.65-6.05)	169	84.50
iii.	High (>6.05)	29	14.50
D. Total Land holding (ha)			
		Frequency	Percentage
i.	Small (Up to 0.80)	70	35.00
ii.	Medium (0.81 to 2.0)	111	55.50
iii.	Large (Above 2.0)	19	9.50
E. Land under traditional Apple (ha)			
Category		Frequency	Percentage
i.	Small (Up to 0.80)	146	73.00
ii.	Medium (0.81 to 2.0)	50	25.00
iii.	Large (Above 2.0)	04	2.00
F. Land under HDP			
Category		Frequency	Percentage
i.	Small (0.05 to 0.30)	147	73.50
ii.	Medium (0.31 to 0.60)	45	22.50
iii.	Large (Above 0.60)	08	4.00
G. Mass media exposure			
i.	Low (<3.77)	14	7.00
ii.	Medium (3.77-10.21)	155	77.50
iii.	High (>10.21)	31	15.50
H. Extension contacts			
Category		Frequency	Percentage
i.	Low (<3.10)	55	27.50
ii.	Medium (3.10-10.52)	107	53.50
iii.	High (>10.52)	38	19.00
I. Scientific orientation			
Category		Frequency	Percentage
i.	Low (<11.79)	06	03.00
ii.	Medium (11.79-16.89)	48	24.00
iii.	High (>16.89)	146	73.00
J. Economic motivation			
Category		Frequency	Percentage
i.	Low (<8.98)	22	08.00
ii.	Medium (8.98-15.04)	146	19.00
iii.	High (>15.04)	32	73.00

Mass media exposure: The data in Table 1 reveals that, majority (77.50%) of the respondents had medium level mass media exposure whereas, 15.00 and only 7.00 percent of the respondents had high and low levels of mass media exposure respectively.

Extension contacts: A close look at Table 1 shows that, more than half (53.50%) of the respondents had medium level extension contacts whereas, 27.00 and 19.00 percent of the respondents had high and low levels of extension contacts respectively.

Scientific orientation: With regard to scientific orientation, it is evident from Table 1 that, majority (73.00%) of the respondents had high level scientific orientation whereas, 24.00 percent of the respondents had medium level scientific orientation and only 3.00 percent of the respondents had low level of scientific orientation.

Economic motivation: From Table 1, it is clear that a majority (73.00%) of the respondents had high level economic motivation followed by 19.00 percent of the respondents with medium economic motivation and only 8.00 percent of the respondents had low level of economic motivation.

Overall knowledge of the respondents: From Table 2 and Fig.1, it is evident that, majority (60.00%) of the respondents had medium level of knowledge whereas, 23.00 percent of the respondents had high level of knowledge and only 17.00 percent of the respondents had low levels of knowledge.

3.2 Relationship between Socio-economic Characteristics of the Respondents and Their Knowledge Level

The correlation values presented in the Table 3 show that the variables namely education, mass media exposure, extension contacts, economic motivation, scientific orientation, innovative proneness and risk proneness of the respondents had a positive and significant relationship with their knowledge level. However, the variables namely age, experience and land holding were not significantly related to the knowledge level of the respondents. The findings were in line with the findings of Reshmy [5] kanavi [6], Babanna [7], borude [8] and Raghupati [9], Singh et al. [10], Panchbhai et al. [11] Meena et al. [12] and Kankarne et al. [13], Kumar et al. [14]

Table 2. Over all knowledge of respondents about production practices of high density apple plantation

S.no.	Variable	Categories	N=200	
			Frequency	Percentage
i.	Knowledge	Low	34	17.00
		Medium	120	60.00
		High	46	23.00

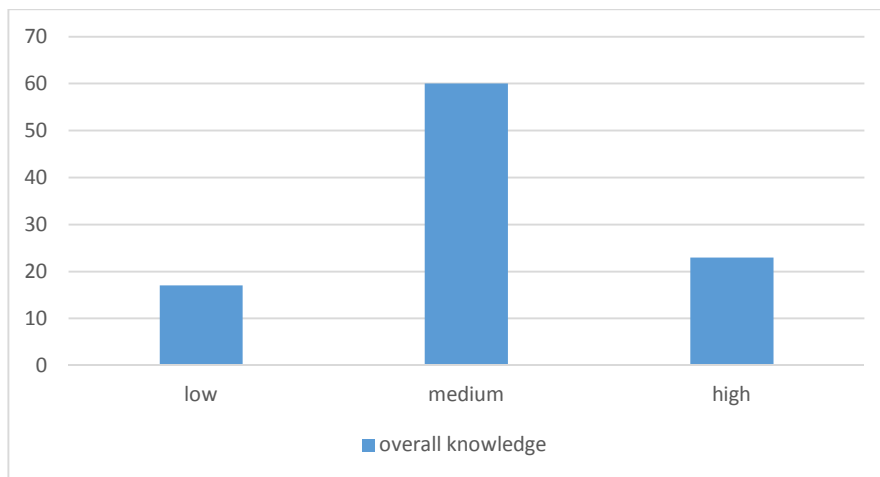


Fig. 1. Distribution of respondents on the basis of overall knowledge

Table 3. Correlation coefficient between socio-economic characteristics and knowledge

S. no.	Socio-economic characteristics	R	p-value
1.	Age	-0.054	0.440
2.	Education	0.154*	0.029
3.	Experience	0.060	0.399
4.	Landholding	0.107	0.131
5.	Extension contacts	0.423**	0.000
6.	Scientific orientation	0.223**	0.001
7.	Economic motivation	0.672**	0.000
8.	Mass media exposure	0.349**	0.000

*significant at 5% level of significance

4. CONCLUSION

Knowledge level of the respondents was found to have a positive and significant relationship with extension contact, mass media exposure and economic motivation whereas, age, experience and landholding had positive but non-significant relationship with knowledge level of the respondents.

5. RECOMMENDATIONS

The study leads us to the fact that HDP apple production needs to be popularized owing to its tremendous economic potential. Farmers, especially the unemployed youth needs to be educated and motivated to take up HDP plantation. This can only be done by conducting awareness camps, group discussions, field visits and exposure visits both within and outside state.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- Anonymous. Area and production of horticulture crops. Area production Statistics. National Horticulture Board; 2015-16.
- Anonymous. High Density Apple Orchard Management. NC State Extension Publications; 2017. Available: <https://content.ces.ncsu.edu/high-density-apple-orchard-management>
- Anonymous. District-Wise/Kind -wise estimated Area and production under Major Horticulture Crops J&K 2016-17. Directorate of Statistics and Economics J&K; 2017.
- Anonymous. Advanced Centre for Horticulture Development Zainapora at a Glance. Directorate of Horticulture Kashmir; 2017.
- Reshmy C. A study on sustainability of coconut and banana intercropping in Kerala - An analysis. M.Sc. Thesis submitted to University of Agricultural Sciences, Bangalore, Karnataka, India; 2001.
- Kanavi VP. A study on knowledge and adoption behaviour of Sugarcane growers in Belgaun district of Karnataka. MSc. (Ag.) Thesis. University of Agricultural Sciences Dharwad, Karnataka; 2000.
- Babanna T. Information source consultancy and training needs of farmers in Arecanut cultivation under Tungabhadra command area in Shimoga district. M.Sc. Thesis submitted to University of Agricultural Sciences, Dharwad, Karnataka, India; 2009.
- Borude SV. An impact of dairy co-operative society on socio-economic development of member farmers. M.Sc. Thesis submitted to Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra State; 1992.
- Raghupati D. Agricultural modernisation, farmers in upper Krishna project area of Karnataka. Ph. D. Thesis submitted to University of Agricultural Sciences, Bangalore, Karnataka, India; 1994.
- Singh AK, Singh D, Singh A, Singh A, Singh M, Kumar A. Knowledge and attitude of the farmers towards raised bed and other improved production technology of *Pigeon pea (Cajanus cajan)* for climate resilient agriculture. Indian Journal of Extension Education. 201;52(3-4):135-140.
- Panchbhai GJ, Siddiqui MF, Sawant MN, Verma AP, Parameswaranaik J. Correlation analysis of socio-demographic profile of dairy farmers with knowledge and

- adoption of animal husbandry practices. International Journal of Current Microbiology and Applied Sciences. 2017;6(3):1918-1925.
12. Meena NC, Badodiya SK, Biam KP. Extent of adoption of improved animal husbandry practices by dairy farmers of Morar Block in Gwalior District. Indian Journal of Extension Education. 2017;53(3):90–93.
13. Kankarne Y, Siddiqui F, Kochewad S. Effect of Socioeconomic traits on the level of Knowledge of dairy farmers. International Journal of Agricultural Science and Research. 2017;7(1):287-292.
14. Kumar R, Slathia PS, Peshin R, Gupta SK. Knowledge level of rapeseed mustard growers of sub-tropical and temperate region of Jammu and Kashmir State. Indian Journal of Extension Education. 2018;54(4):18-24.

© 2019 Wani et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle3.com/review-history/49168>