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## An analysis of knowledge level of farmers of recommended apple cultivation practices in district Shopian of Jammu and Kashmir India

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### Abstract

The present study was conducted in district Shopian of Jammu and Kashmir with the size of 180 respondents. The district Shopian was purposively selected, because of the potentiality for the development of horticulture, mainly because 90 percent area of the district was under apple plantation. The data was collected from three different altitudes viz- low, medium and high altitudes, and it has been revealed that majority of the apple growers were having medium level of knowledge regarding different components of the apple cultivation (plant production, plant protection and harvesting, post harvesting and marketing) except the value addition aspect wherein apple growers were having low knowledge level, so it is explicit that apple growers were not cultivating apple in accordance with the recommended practices. The study revealed that the knowledge level of low altitude fruit growers was high, followed by mid altitude fruit growers, while it was of very low level in case of fruit growers of high altitude areas.

**Keywords:** Altitude, apple cultivation, Kashmir, knowledge level

### Introduction

Agriculture is the back bone of the Indian economy and plays a vital role in the overall development of the nation and most of the Indian population is directly or indirectly involved in agriculture. Agricultural as well as the horticultural sector is considered as one of the effective factors in economic development of India. Achieving food and nutritional security is possible only by making use of new technologies in farm land. Today in most parts of the world, due to limited land and water resources, increase in production and quality food is hardly possible unless need based effective techniques in production system are adopted by the farmers. People have shifted towards non-conventional dietary patterns, using more of fruits, vegetables and other food items, which are rich in proteins etc. Thus, the demand for these food items has increased tremendously; as such crop patterns too are shifting rapidly, the shifting of cropping patterns in favour of horticultural crops is too demanding for specialised practices that must be known to the farmers, from the very inception of establishment of an orchard till it comes into bearing and thereafter for its management. These practices need specialised trainings such as propagation of planting material, training and pruning, fertilization, application of recommended pesticides and fungicides and other management practices that could make the crop more remunerative, owing to a direct relationship with its productivity and quality.

In the state of Jammu and Kashmir, Kashmir valley is endowed with congenial agro-climatic conditions for a wide range of horticultural crops. The growth in area and production of horticultural crops like peach, pear, plum, and apple, is quite impressive. Jammu and Kashmir is rightly known as an apple state of India, contributing 4,200 crore to the state [1].

Apple is one of the most widely cultivated tree fruits. The apple is the fourth widely produced fruit in the world after banana, orange and grapes. India is ranked as the sixth largest world's apple producing country and second largest country in area [2]. As far as apple production is considered, it accounts for 51 % of total area of 2.72 lakh hectares under all temperate fruits grown in this state. The annual apple production in the state is 13.73 lakh Metric tonnes [3]. So to have such a potential in the apple industry here in Kashmir, it is imperative that the farmers should be acquainted to the recommended practices of apple cultivation. Knowledge is defined as a body of understood information possessed by an individual. Knowledge refers to

information possessed by an individual. It also refers to those behaviour's and test situations which emphasis the remembering of some phenomenon or material by an individual either by recognition or by recall of ideas <sup>[4]</sup>. The knowledge level in the present study has been operationalized as the extent to which an individual possesses understanding and comprehension on various dimensions of apple cultivation. It also refers to the farmers understanding of the recommended cultivation practices of apple cultivation or it refers to the body of information understood and retained by the farmers about recommended apple cultivation practices.

A study conducted on characteristics of farmers influencing their knowledge about use of bio fertilizers and observed that majority (58.67%) of the farmers had knowledge about the use of bio fertilizers to a moderate level followed by 22.67 per cent of them had high level of knowledge and 18.66 per cent of them had low level of knowledge, <sup>[5]</sup>. It has been found that majority of farmers and institutions in the Hindu Kush Himalayan region have little knowledge about gardening that is limiting the productivity and quality of cash crops like apples and other fruits and vegetables. The constraints for such low yield were lack of technical knowledge and training to the farmers, <sup>[6]</sup>. It has been revealed in the study on bio-fertilizers farmer attitude and adoption, that majority of the farmers (84.00%) belonged to moderate level of knowledge about different kinds of bio-fertilizers and their associated practices, about one tenth of them were adequately equipped with the knowledge about bio fertilizers and appeared in high knowledge category <sup>[7]</sup>. A study conducted on impact of trainings conducted on vermin-compost by Krishi Vigyan Kendra observed that trained farmers had knowledge about the practices like preparation of vermin-compost pit (100.00%), construction of vermin-compost pit (50.00%), pit filling (96.67%), sequential filling of pit layer wise (75.00%), watering pit (98.33%) and harvesting practice (95.00%), <sup>[8]</sup>. It has been found that marginal farmers were poor accepters of innovations. One of the reasons of poor adoption/acceptance was the low level of knowledge and skill of farmers in growing and managing fruit plants/gardens. This study was, therefore, planned to identify and prioritize competencies and training needs such as knowledge, skill and attitude of fruit growers in district Faisalabad, Pakistan, <sup>[9]</sup>.

The mean and standard deviation of all the respondents' knowledge scores were computed for classifying the knowledge in different categories. Based on the mean knowledge score and standard deviation, the farmers were categorized under three knowledge level categories, namely low, medium and high.

### Methodology

The present study was conducted in the state of Jammu and Kashmir comprising the extreme sector of Himalaya's and occupies a central geographical location in the Asian continent.

A multistage sampling procedure was adopted for the selection of districts, Tehsils, villages and sample respondents. Kashmir valley consists of 10 districts namely Anantnag, Kulgam, Pulwama, Shopian, Srinagar, Bandipora, Baramulla, Budgam, Ganderbal and Kupwara. Among these, district Shopian was selected purposively. District Shopian was purposively selected because of the potentiality for the development of horticulture, mainly because 90 per cent area of the district was under apple plantation and prevailing agro climatic situations were very good for cultivation of horticultural crops especially fruit crops and apple in

particular. The study was conducted in three types of altitudes viz. high altitude, mid altitude and low altitude in the form of strata which were purposively selected. Each strata consisted of three villages which were randomly selected. Accordingly a sample size of twenty farmers from each village was selected randomly, thus making a sample size of sixty respondents from each strata based on the total number of respondents engaged within apple cultivation. A sample size of 180 respondents from all the three strata's was included in the study.

### Results

#### Knowledge level of farmers of recommended apple cultivation practices (low altitude areas).

The data presented in table 1 reveals that in low altitude, 71.66 per cent of the apple growers were having medium level of knowledge, followed by 15 per cent of apple growers, who had low level of knowledge and 13.44 per cent of apple growers were having the high level of knowledge regarding plant production aspect of apple cultivation. In case of plant protection aspect 65 per cent of the apple growers were having medium level of knowledge followed by 18.44 per cent of apple growers, who were having low level of knowledge and 16.66 per cent of apple growers were having high level of knowledge. In case of harvesting, post harvesting and marketing aspect of apple cultivation 46.66 per cent of the apple growers were having medium level of knowledge followed by 30 per cent of apple growers, who were having high level of knowledge and 23.44 per cent of apple growers were having low level of knowledge. In value addition aspect of apple cultivation 43.33 per cent of the apple growers were having low level of knowledge followed by 38.33 per cent of apple growers, who were having medium level of knowledge and 18.44 per cent of apple growers were having high level of knowledge.

Further perusal of data from the table reveals that mean knowledge score expressed in percentage shows that in low altitude farmers were having maximum i.e. 76.76 per cent of knowledge in plant protection aspect of the recommended apple cultivation, followed by 67.81 per cent in harvesting, post harvesting and marketing aspect, 61.85 per cent of knowledge in plant production aspect of apple cultivation and minimum of 14.47 per cent in value addition aspect of apple cultivation as shown in (Fig 1).

#### Knowledge level of farmers of recommended apple cultivation practices (mid altitude areas).

The data presented in table 2 reveals that in mid altitude, 65 per cent of the apple growers were having the medium level of knowledge, followed by 21.66 per cent of apple growers, who had high level of knowledge and 13.44 per cent of apple growers were having low level of knowledge regarding plant production aspect of apple cultivation. In case of plant protection aspect 68.44 per cent of the apple growers were having medium level of knowledge followed by 16.66 per cent of apple growers, who were having low level of knowledge and 15 per cent of apple growers were having high level of knowledge. In case of harvesting, post harvesting and marketing aspect of apple cultivation 75 per cent of the apple growers were having medium level of knowledge followed by 15 per cent of apple growers, who were having low level of knowledge and 10 percent of apple growers were having high level of knowledge. In value addition aspect of apple cultivation 70 percent of the apple growers were having low level of knowledge followed by 16.66 percent of apple

growers, who were having medium level of knowledge and 13.44 percent of apple growers were having high level of knowledge.

Further perusal of data from the table reveals that mean knowledge score expressed in percentage shows that in low altitude farmers were having maximum i.e. 69.26 per cent of knowledge in plant protection aspect of apple cultivation, followed by 57.04 per cent in plant production, 55.93 per cent of knowledge in harvesting, post harvesting and marketing aspect of apple cultivation and minimum of 10.93 per cent of knowledge in value addition aspect of apple cultivation as shown in (Fig 2)

#### Knowledge level of farmers of recommended apple cultivation practices (high altitude areas)

The data presented in table 3 reveals that in high altitude, 66.66 percent of the apple growers were having medium level of knowledge, followed by 20 percent of apple growers, who had low level of knowledge and 13.44 percent of apple growers were having high level of knowledge regarding plant production aspect of apple cultivation. In case of plant protection aspect 66.66 percent of the apple growers were having medium level of knowledge followed by 18.44 percent of apple growers, who were having low level of knowledge and 15 percent of apple growers were having high level of knowledge. In case of harvesting, post harvesting and marketing aspect of apple cultivation 48.44 percent of the apple growers were having medium level of knowledge followed by 41.66 percent of apple growers, who were having the low level of knowledge and 10 percent of apple growers were having high level of knowledge. In value addition aspect of apple cultivation 70 percent of the apple growers were having the low level of knowledge followed by 28.44 percent of apple growers, who were having the medium level of knowledge and 1.66 percent of apple growers were having the high level of knowledge.

Further perusal of data from the table reveals that mean knowledge score expressed in percentage shows that in low altitude farmers were having maximum i.e. 61.32 per cent knowledge in plant protection aspect of apple cultivation, followed by 51.96 per cent in plant production, 31.56 per cent of knowledge in harvesting, post harvesting and marketing aspect of apple cultivation and minimum of 9.89 per cent in value addition aspect of apple cultivation as shown in (Fig 3).

#### Overall Knowledge of farmers

It is evident from the data presented in table 4 that in plant

production aspect of apple cultivation the farmers of low altitude areas were having maximum knowledge of 61.85 per cent, followed by 57.04 per cent of knowledge of mid altitude farmers and 51.96 per cent of knowledge of high altitude farmers. It also reveals that in plant protection aspect, farmers of lower altitude possess 76.76 per cent of knowledge (highest among in all the components), followed by 69.26 of knowledge of mid altitude farmers and 61.32 per cent of knowledge of high altitude farmers. In the same manner farmers of lower altitude areas were having 67.81 per cent of knowledge, followed by 55.93 per cent knowledge of mid altitude farmers and 31.56 per cent knowledge of high altitude farmers in harvesting, post harvesting and marketing aspect of apple cultivation. It is also evident from the data that farmers of lower altitude areas were having 14.47 per cent of knowledge, followed by 10.93 per cent knowledge of mid altitude farmers and 9.89 per cent knowledge of high altitude farmers in value addition aspect of apple cultivation. It indicates that farmers possess the highest percentage of knowledge in plant protection aspect and least in value addition aspect.

It has been observed that majority of the apple growers were having medium level of knowledge in all the three altitude areas in all the components of production technology except value addition component of apple cultivation wherein majority of the apple growers were having low level of knowledge, the possible reason for the medium level of knowledge in plant production, plant protection, and harvesting, post harvesting and marketing components of apple cultivation is that the practices which are complex and difficult to remember are moderately known to farmers. On the other hand, the practices which are simple and are traditionally practiced are known to majority of the farmers. These findings are in agreement with the findings of Kantharaju (1989) <sup>[10]</sup> and Balasubramani (1997) <sup>[11]</sup> which indicated that more number of apple growers belonged to medium knowledge category. The possible reason of low knowledge level of majority of the farmers in value addition component of apple cultivation may be selling of their produce to money lenders, lack of resources, inadequate market access, lack of coordination of farmers with juice factories. It was also seen that among all the four components the majority of the apple growers were having maximum knowledge regarding plant protection component of apple cultivation, the possible reason could be that farmers are most acquainted with the spray chemicals, as in a year farmers have to do 5-8 sprays.

**Table 1:** Knowledge level of farmers of recommended apple cultivation practices in low altitude areas.

Component	Max. Possible Score	Overall Score	Mean (×) Knowledge Score	Knowledge Level			S.D	Mean Knowledge Score expressed in Percentage
				Category	Frequency.	%age		
Plant production	44	1633	27.21	Low Medium High	9 43 8	15 71.66 13.44	5.02	61.85
Plant protection	34	1566	26.10	Low Medium High	11 39 10	18.44 65 16.66	5.03	76.76
Harvesting post harvesting and marketing	16	651	10.85	Low Medium High	14 28 18	23.44 46.66 30	2.89	67.81
Value Addition	16	139	2.31	Low Medium High	26 23 11	43.33 38.33 18.44	1.59	14.47

**Table 2:** Knowledge level of farmers of recommended apple cultivation practices (mid altitude areas).

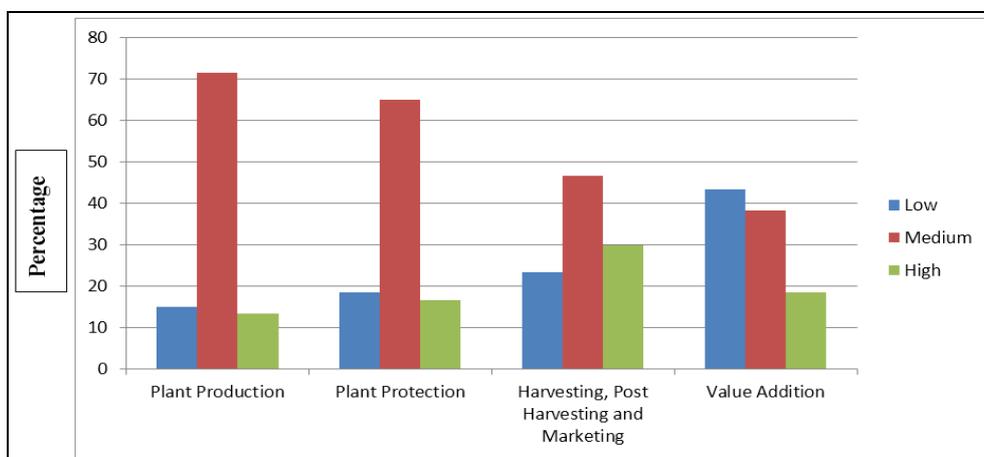
Component	Max. Possible Score	Overall Score	Mean (x) Knowledge Score	Knowledge Level			S.D	Mean Knowledge Score expressed in Percentage
				Category	Frequency.	%age		
Plant production	44	1506	25.10	Low	08	13.44	5.54	57.04
				Medium	39	65		
				High	13	21.66		
Plantprotection	34	1413	23.55	Low	10	16.66	5.39	69.26
				Medium	41	68.44		
				High	09	15		
Harvesting post harvesting and marketing	16	537	8.95	Low	09	15	2.21	55.93
				Medium	45	75		
				High	06	10		
Value Addition	16	105	1.75	Low	42	70	1.36	10.93
				Medium	10	16.66		
				High	08	13.33		

**Table 3:** Knowledge level of farmers of recommended apple cultivation practices (high altitude areas).

Component	Max. Possible Score	Overall Score	Mean (x) Knowledge Score	Knowledge Level			S.D	Mean Knowledge Score expressed in Percentage
				Category	Frequency.	%age		
Plant production	44	1372	22.87	Low	12	20	6.80	51.96
				Medium	40	66.66		
				High	08	13.44		
Plantprotection	34	1251	20.85	Low	11	18.44	6.13	61.32
				Medium	40	66.66		
				High	09	15		
Harvesting post harvesting and marketing	16	303	5.05	Low	25	41.66	2.07	31.56
				Medium	29	48.44		
				High	06	10		
Value Addition	16	95	1.58	Low	42	70	1.36	9.89
				Medium	17	28.44		
				High	01	1.66		

**Table 4:** Overall Knowledge of farmers

S. No.	Component	Low Altitude	Mid Altitude	High Altitude
1	Plant Production	61.85	57.04	51.96
2	Plant Protection	76.76	69.26	61.32
3	Harvesting Post Harvesting and Marketing	67.81	55.93	31.56
4	Value Addition	14.47	10.93	9.89



**Fig 1:** Knowledge level of farmers in low altitude areas.

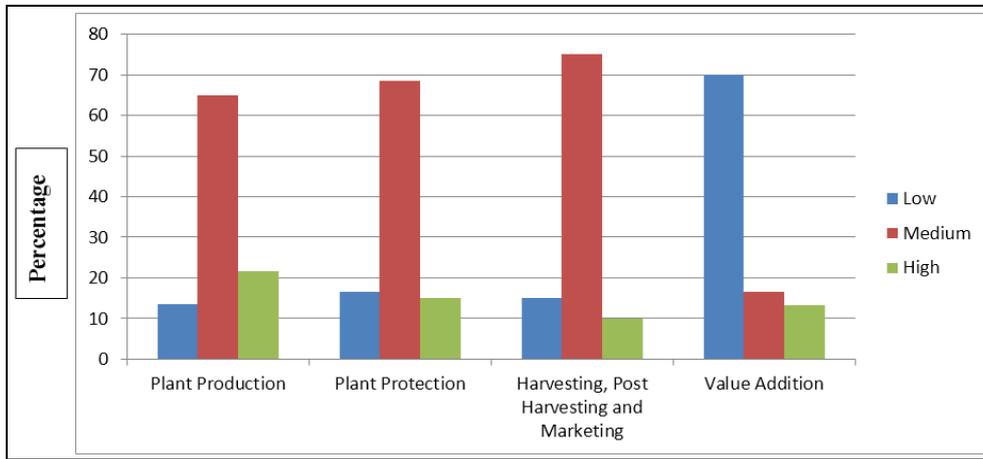


Fig 2: Knowledge level of farmers in mid altitude areas

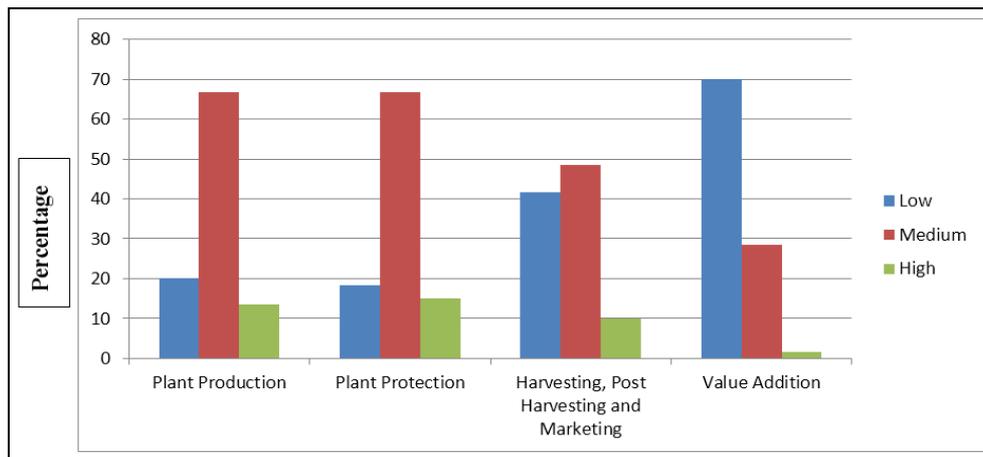


Fig 3: Knowledge level of farmers in high altitude areas

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