Knowledge Level of Mango Orchardists in Relation to Different Practices of Mango in Meerut Districts Uttar Pradesh, India

Gaurav Kumar [aφ*], **R. N. Yadav** [b#], **R. K. Doharey** [a#], **Vishal Yadav** [a†]
and Manoj Kumar [b‡]

[a] *Department of Extension Education, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, U.P.-224229, India.*
[b] *Department of Agricultural Extension and Communication, SVPUA & T, Modipuram, Meerut, U.P.-250110, India.*

Authors' contributions

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

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ABSTRACT

This study was carried out in the Meerut district of Uttar Pradesh to evaluate the current situation of mango orchardists with the objective, Knowledge level of mango orchardists in connection to various practices of mango orchardists. With the assistance of progressive orchardists and the local pradhan, 10 orchardists were randomly selected from each preferred village, making a total sample size of 80 orchardists for the current study. The structured schedule was developed keeping in view the objectives and variables to be studied. The respondents were contacted personally for data collection. Out of 14 cultivation practices i.e. agricultural practices of Mango cultivation, the majority (56.25%) under high-level knowledge of improved varieties of mango. Most of the orchardists (63.75%) were medium level of knowledge the land preparation practices. It was found that (62.50%) of orchardists had a medium level of expertise in plantation procedures. About (66.25%)

φ *Ph. D. Scholar;*
Professor;
† *PG Scholar;*
‡ *SMS;*
Corresponding author: E-mail: kumgaurav1993@gmail.com;

had medium level of knowledge the manures and fertilizers application. The majority (72.50%) were medium level of knowledge irrigation management. The majority of orchardists (48.75%) had a moderate degree of expertise on plant protection strategies. It was noted that the majority of orchardists (63.75%) have extensive understanding of the proper harvesting technique. From the orchardists (67.50%) were medium level of knowledge about yields take to bearing of fruit plant. The majority (55.00%) were low level of knowledge about the use of plant growth regulators. It was found that (58.75%) were high level of knowledge about the suitable inter crops. It was observed that the most of the orchardists (38.75%) were reported under medium level of knowledge about the storage of fruits after harvesting. It was noted that (45.00%) of orchardists had low levels of packaging of mango fruits for sale at nearby markets. The majority of orchardists (42.50%) were found to have limited expertise of how to package mango fruits for sale at distant markets. It was found that (48.75% of orchardists had a high degree of understanding on mango marketing.

1. INTRODUCTION

Mango (*Mangifera indica* L.) comes under the family *Anacardiaceae* is the most important commercially grown fruit crop of the country. It is called the *King of fruits*. India has the richest collection of mango cultivars. Cultivation of mango is believed to have originated in South East Asia. Mango is being cultivated in south Asia for nearly six thousand years. Mango is native to South Asia, from where it has been distributed worldwide to become one of the most cultivated fruits in the tropics [1-3].

India to become the second largest fruit producer in the world, after china, with a production of 90183 thousands metric tonnes of fruits from an area of 6301 thousands hectares in 2015-16 [4,5]. The fruit is grown in India, the total area under mango cultivation was 2209 thousand hectare with an annual production of 18,643 thousand metric tonnes. The productivity of mango was 8.44 metric tonnes per hectare recorded during 2015-16 Uttar Pradesh is the leading mango producing state with production of 4512.72 thousand tons in 263.28 thousands hectares 2015-16. (NHB).

In the cultivars Alphonso, Pairi, and Kent, 17 different fatty acids were identified and quantified during development and ripening of mango fruit with an increase of unsaturated fatty acids and an omega-6/omega-3 ≤ 1 at the ripe stage, which suggests that mango fruit is a good source of essential fatty acids. The respondents were contacted personally for data collection. Out of 10 cultivation practices i.e. agricultural practices of Mango cultivation, Field preparation (87.56%) was rank at 1st as far as knowledge possessed by the respondents was concerned. The practice Fertilizer application rank at 2nd (85.45%),

followed by High yielding varieties at rank 3rd (76.56%), Intercropping and weed management at rank 4th (67.45%), Irrigation management at rank 5th (66.21%), Plant protection measures at rank 6th (61.23%), Harvesting and marketing at rank 7th (59.11%), Transplanting at rank 8th (48.43%), Recommended spacing at rank 9th (45.09%) and Plant growth regulators at rank 10th (25.89%) [6].

The respondents have 50 per cent of medium knowledge about mango production technology followed by high 30 per cent and low 20 per cent knowledge about mango production technology Independent variables viz. mango growers, education, land holding, annual income, social participation, extension contact, sources of information, economic motivation, and risk orientation showed highly significant relation, whereas only farming experience showed non-significant relation with knowledge level of mango growers about recommended packages and practices [7].

The campaigning were organized during the mango cropping season of year 2016-17. Before campaigning, the highest score (72.25) was recorded in knowing the nature of damage of the pest or diseases and the lowest score (35.00) was in crop protection aspect. The overall gain in knowledge was 84.54 per cent which appears to be a very good outcome of campaigning. The increase in mean knowledge score was observed significantly higher as the computed value of 't' (12.48) was statistically significant at 5% probability level [8].

Meerut district, mango groves are spread over 17,000 hectares of land. On an average, 12 metric tons of mangoes are produced from one hectare. The total average mango crop produced

in the district is around 204 metric tons. Western Uttar Pradesh districts such as Saharanpur, Bulandshahar, Shamli and Meerut account for a large part of the nationwide cultivation of mango [9,10,11]. The produce from the region is sold in local markets as well as markets in other states such as Punjab and Haryana. A major part of the mango is also sold in Delhi Azadpur market. The region is home to over 70 varieties of mangoes. The most popular varieties are "langda, maalda, chausa, dussehri, ramkela" and "golajawarish". The dussehri mango from this region is distinct from its Malihabad (eastern UP) counterpart since it is smaller but sweeter (The Times of India, 2016).

2. MATERIALS AND METHODS

The present study was conducted in Meerut district of Uttar Pradesh because the area under mango cultivation is adequate in this district. The Meerut district has comprises 12 community development block which two blocks namely Sardhana and Machhara were purposely selected according to need and availability of mango orchardists. The revenue villages was arrange in descending order based on the maximum area and maximum number of mango Orchardists, top 4 revenue villages were select from the each block. On the basis of maximum area and production, 10 orchardists were selected from each selected village randomly with the help of progressive orchardists and village pradhan, thus the total sample size of 80 orchardists were selected for the present investigation. Data were collected with the help of pre structured interview schedule covering all aspect of the present study. To make the procedure and information reliable and accurate, the investigator himself collected data with every individual mango orchardists either at his farm or his home. Scheduled developed was used for collecting information comprehensively. Before collecting information the purpose of the interview and study as a whole were explained to the orchardists. The tabular analysis, percentage, mean (average), rank order, and standard deviation statistical techniques and analytical tools utilised to measure and analyse the data in the study are described briefly below.

1. Tabular analysis:

For comparison and interpretation of various aspects, knowledge, adoption, and constraints responsible, tabular analysis was used.

2. Percentage:

Simple comparison has been made on the basis of percentage. For obtaining percent, the frequency of a particular cell was multiplied by 100 and divided by the total number of orchardists in that particular category to which all of them belonged. The formula used to calculate the percentage is given below-

$$\text{Percentage} = \frac{\text{Frequency}}{\text{Number of respondent}} \, x \, 100$$

3. Mean (Average):

The mean ($\overline{X}$) was calculated by adding the total scores obtained by the respondents and divided it by the total number of respondents using the following formula:

$$(\overline{X}) = \frac{\sum X}{N}$$

Where,

($\overline{X}$) = Average or mean
$\sum x$ = Total number of scores obtained by respondents
N = Total number of respondent

4. Rank order:

The various ranks were given on the basis of highest to the lowest frequency.

5. Standard Deviation (SD):

S.D. is the square root of mean of the squares of all deviations, the directions being measured from the arithmetic mean of the distribution. It is commonly developed by symbol sigma (σ).

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^{N} (x_i - \overline{x})^2}$$

Where,

σ   =   Standard deviation
d   =   Deviation from variables mean
n   =   Total number of items

3. RESULTS AND DISCUSSION

To assess the knowledge level of the mango orchardists divided in three group high, medium and low in relation to different practices of mango production technology which are described below:

1. Improved varieties:

The data from the Table 1. Revealed that the most of the respondents were having high level of knowledge about the improved varieties of mango. Among the total sample size 56.25 per cent respondents were reported under high level of knowledge about the improved varieties of mango followed by 38.75 per cent of the respondents were reported under medium level of knowledge about the improved varieties of mango. Only 05.00 per cent respondents were having under low level of knowledge about the improved varieties of mango.

2. Land preparation:

The data from the Table 1. Revealed that the most of the respondents were having medium level of knowledge about the land preparation practices of mango orchard. Among the total sample size 63.75 per cent respondents were reported under medium level of knowledge about the land preparation practices of mango orchard followed by 18.75 per cent of the respondents were reported under high level of knowledge about the land preparation practices of mango orchard and remaining 17.50 per cent respondents were having under low level of knowledge about the land preparation practices of mango orchard.

3. Plantation practices:

The data from the Table 1. Showed that the most of the orchardists were medium level of knowledge about the Plantation practices of mango plant. Among the total sample size 62.25 per cent orchardists were reported under medium level of knowledge about the Plantation practices of mango plant and 21.25 per cent orchardists were reported high level of knowledge about plantation practices of mango plant. Only 16.25 per cent orchardists were reported under low level of knowledge about the plantation practices of mango plant.

4. Manures and fertilizers application:

The data from the Table 1. Showed that the most of the orchardists were medium level of knowledge about manures and fertilizers application in mango orchard. Among the total sample size 66.25 per cent orchardists were reported under medium level of knowledge and 23.75 per cent orchardists were reported under low level of knowledge about the manures and fertilizers application in mango orchard. Only 10.00 per cent orchardists were reported under high level of knowledge about the manures and fertilizer application in mango orchard.

5. Irrigation:

The data from the Table 1. Showed that the most of the orchardists were medium level of knowledge about the irrigation management of mango orchard. Among the total sample size 72.50 per cent orchardists were reported under medium level of knowledge and 17.50 per cent orchardists were reported under high level of knowledge about the irrigation management of mango orchard. Only 10.00 per cent orchardists were reported under low level of knowledge about the irrigation management of mango orchard. In the study of area good irrigation facilities were available. Most of the mango orchardists were having their own private electric tube well.

6. Use of plant growth regulators:

The data from the Table 1. Presented that the most of the orchardists were low level of knowledge about the use of plant growth regulators in mango orchards. Among the total sample size 55.00 per cent orchardists were reported under low level of knowledge and 42.50 per cent orchardists were reported under medium level of knowledge about the use of plant growth regulators in mango orchard. Only 02.50 per cent orchardists were reported under high level of knowledge about the use of plant growth regulators in mango orchard.

7. Plant protection measures:

The data from the Table 1. Presented that the most of the orchardists were medium level of knowledge about the plant protection measures of mango orchards. Among the total sample size 48.75 per cent orchardists were reported under medium level of knowledge, 33.75 per cent orchardists were reported under high level of knowledge about the plant protection measures of mango orchards and remaining 17.50 per cent orchardists were reported under low level of knowledge about the plant protection measures

of mango orchards. The mostly respondent were not having any scientific knowledge regarding name of pesticides, their doses and method of application of pesticides for plant protection measurement in mango orchard.

8. Suitable inter crops in mango orchards:

The data from the Table 1. showed that the most of the orchardists were medium level of knowledge about the suitable inter crops in mango orchards. Among the total sample size 40.00 per cent orchardists were reported under medium level of knowledge 37.50 per cent orchardists were reported under high level of knowledge about the suitable inter crops in mango orchards and remaining 22.50 per cent orchardists were reported under low level of knowledge about the suitable inter crops in mango orchards.

9. Yields take to bearing of fruit plant:

The data from the Table 1. Showed that the most of the orchardists were medium level of knowledge about the yields take to bearing of fruit plant of the mango orchards. Among the total sample size 67.50 per cent orchardists were reported under medium level of knowledge and 18.75 per cent orchardists were reported under high level of knowledge about the yields take to bearing of fruit plant of the mango orchards. Only 13.75 per cent orchardists were reported under low level of knowledge about the yields take to bearing of fruit plant of the mango orchards.

10. Harvesting procedure:

The data from the Table 1. Presented that the most of the orchardists were high level of knowledge about the correct harvesting procedure of mango fruits. Among the total sample size 63.75 per cent orchardists were reported under high level of knowledge, 35.00 per cent orchardists were reported under medium level of knowledge about the correct harvesting procedure of mango fruits. Only 01.25 per cent orchardists were reported under low level of knowledge about the correct harvesting procedure of mango fruits.

11. Storage of fruit after harvesting:

The data from the Table 1. Reveals that the most of the orchardists were medium level of knowledge about the storage of fruits after harvesting of the mango fruits. Among the total sample size 38.75 per cent orchardists were reported under medium level of knowledge, 37.50 per cent orchardists were reported under low level of knowledge about the storage of fruits after harvesting from the mango plants. Only 23.75 percent orchardists were reported under high level of knowledge about the storage of fruits after harvesting from the mango plants.

12. Packing of mango for disposal at short distant market:

The data from the Table 1. Showed that the most of the orchardists were low level of knowledge about the packing of mango fruits for disposal at short distance market. Among the total sample size 45.00 percent orchardists were reported under low level of knowledge, 35.00 percent orchardists were reported under medium level of knowledge about the packing of mango fruits for disposal at short distance markets. Only 20.00 per cent orchardists were reported under high level of knowledge about the packing of mango fruits for disposal at short distance market.

13. Packing of mango for disposal at long distant market:

The data from the Table 1. Observed that the most of the orchardists were low level of knowledge about the packing of mango fruits for disposal at long distance market. Among the total sample size 42.50 per cent orchardists were reported under low level of knowledge, 35.00 per cent orchardists were reported under medium level of knowledge about the packing of mango fruits for disposal at long distance markets and remaining 22.50 percent orchardists were reported under high level of knowledge about the packing of mango fruits for disposal at long distance market.

14. Marketing procedure:

It is clear from the Table 1. That the most of the orchardists were high level of knowledge about the marketing procedure of mango fruits. Among the total sample size 48.75 per cent orchardists were reported under high level of knowledge 26.25 per cent orchardists were reported under medium level of knowledge about the marketing procedure of mango fruits and remaining 25.00 per cent orchardists were reported under low level of knowledge about the marketing procedure of mango fruits.

Table 1. To assess the knowledge level of the mango orchardists in relation to different practices of mango production technology

Sr. No.	Statements	High knowledge		Medium knowledge		Low knowledge	
		F	P	F	P	F	P
1	Improved varieties	45	56.25	31	38.75	4	5.00
2	Land preparation	15	18.75	51	63.75	14	17.50
3	Plantation practices	17	21.25	50	62.50	13	16.25
4	Manures and fertilizers application	8	10.00	53	66.25	19	23.75
5	Irrigation	14	17.50	58	72.50	8	10.00
6	Use of plant growth regulators	2	2.50	34	42.50	44	55.00
7	Plant protection measures	27	33.75	39	48.75	14	17.50
8	Suitable inter crops in mango orchards	30	37.50	32	40.00	18	22.50
9	Yields take to bearing of fruit plant	15	18.75	54	67.50	11	13.75
10	Harvesting procedure	51	63.75	28	35.00	1	1.25
11	Storage of fruit after harvesting	19	23.75	31	38.75	30	37.50
12	Packing of mango for disposal at short distant market.	16	20.00	28	35.00	36	45.00
13	Packing of mango for disposal at long distant market.	18	22.50	28	35.00	34	42.50
14	Marketing procedure	39	48.75	21	26.25	20	25.00

F-frequency, P-percentage

4. CONCLUSION

We observed that the majority 56.25 per cent orchardists were reported under high level of knowledge about improved varieties of mango. It was clear from the study that the most of the orchardists 63.75 per cent were medium level of knowledge about the land preparation practices of mango orchard. It was found that 62.5 percent of orchardists had a medium level of expertise on plantation procedures. It was observed that the most of the orchardists 66.25 per cent had medium level of knowledge about the manures and fertilizers application in mango orchard. It was observed from the study that the most of the orchardists 72.50 per cent were medium level of knowledge about irrigation management in mango orchard. From the most of the orchardists 48.75 per cent were medium level of knowledge about the plant protection measures of mango orchard. Observed that the most of the orchardists 63.75 per cent were high level of knowledge about the correct harvesting procedure of mango fruits. From the orchardists 67.50 per cent were medium level of knowledge about yields take to bearing of fruit plant in mango orchards. It was observed that the most of the orchardists 55.00 per cent were low level of knowledge about the use of plant growth regulators in mango orchards. From the most of the orchardists 58.75 per cent were high level of knowledge about the suitable inter crops in

mango orchard. It was observed that the most of the orchardists 38.75 per cent were reported under medium level of knowledge about the storage of fruits after harvesting. It was noted that 45.0% of orchardists had low levels of understanding about the packaging of mango fruits for sale at nearby markets. The majority of orchardists, 42.50 percent, were found to have limited expertise of how to package mango fruits for sale at distant markets. It was found that 48.75 percent of orchardists had a high degree of understanding on mango marketing.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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