

PERCEPTION OF THE MANGO GROWERS ABOUT REJUVENATION TECHNOLOGY

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ABSTRACT

The decline of mango productivity has been attributed to various factors. The most of the problems are due to faulty management i.e. unsuitable site and climate, cultivation of intercrops, inadequate nutrition, improper planting, undesirable planting materials, incidence of insect, pest and disease and other biotic and abiotic stress. Rejuvenation of mango trees makes them more manageable and facilitates the adoption of appropriate package of practices, resulting in improved vigor and yield. This involves adopting suitable pruning methods, providing adequate nutrients and plant protection management, developing an appropriate canopy, and implementing other holistic management operations. To conduct a study on mango rejuvenation, a multistage, purposive, and random sampling technique was employed. The study was carried out in Gir Somnath district of the Saurashtra region, with Talala, Kodinar, Una, and Sutrapada selected purposively as the four talukas, and three villages randomly selected from each of these talukas, resulting in a total of 12 villages being selected for the study. Ten mango growers were then randomly selected from each of these villages as respondents, totaling 120 mango growers. The respondents were interviewed using a specially designed schedule, and the results showed that the majority (53.33 percent) of the respondents had a medium level of perception about the recommended mango rejuvenation technology, followed by 27.50 percent of respondents who had a high level of perception about the recommended mango rejuvenation technology, while 19.17 percent had a low level of perception about the recommended mango rejuvenation technology. It is essential to adopt and promote scientific practices that can enhance mango productivity and rejuvenation to address these issues.

Keywords: adoption, mango growers, perception, pruning, rejuvenation technology.

INTRODUCTION

Mangifera indica L., commonly known as Mango, is a member of the *Mangifera* genus within the Anacardiaceae family, comprising a diverse array of approximately one thousand cultivars. Its cultivation dates back over 4000 years in the Indian sub-continent and finds mention in early Sanskrit literature as “Amra.” Mango holds significant cultural and religious significance in Hindu mythology and observances.

Historical records reveal the admiration of the Mughal ruler Babar, who hailed the mango as the most esteemed fruit in Hindustan. As an indigenous fruit of India, Mango reigns as the foremost fruit crop in terms of both production and cultivation area. It occupies a paramount position in Indian agriculture, comparable to apples in temperate regions and grapes in subtropical regions. Acclaimed as the “King of Fruits,” mangoes are widely embraced in India due to their exceptional nutritional profile, unparalleled gustatory appeal, and captivating aroma. These attributes have contributed to the widespread acclaim and allure of mango, rendering it an adored fruit in India’s gastronomic realm.

lakh MT in 2017-18 and at state level 91.71 thousand MT in 2020-21. Major mango producing areas in Gir Somnath district are Una, Kodinar, Talala, Gir Gadhada, Veraval. Flowering in the mango crop starts during the January and ends during February. Major fruit set period of mango is March-April. Mango season with local varieties starts from the May that continues up to the July. Kesar varieties are exported to other states from Gir Somnath district. Veneer grafting, epicotyle grafting and inarching are the main plant propagation methods of mango in Gir Somnath district (Anon., 2017-18).

The investigation of perception serves as a focal point in the examination of human conduct. Perception is the process of interpreting sensations, and our perception is heavily influenced by past experiences. As a result, perception is a mental process that relies on a variety of sensory inputs and cognitive constructs, which are integrated into a unified whole. Although perception cannot be directly observed in behavior, it can be inferred through changes in performance or behavior (Dabhale, 2017).

This underscores the crucial role of perception in shaping human cognition and behavior, and highlights the

Status of mango production at national level 22.5

need for continued research in this area to gain a deeper understanding of the underlying mechanisms.

Rejuvenation technology

Rejuvenation, in the realm of horticulture, encompasses a strategic approach involving precise pruning and subsequent management techniques employed to restore the productivity of plants by leveraging their existing root systems. The primary objective of this process is to optimize the cultivability of fruit trees, enable the adoption of appropriate agricultural practices, and ultimately enhance their vitality and yield. When it comes to mango trees, rejuvenation entails the implementation of meticulously tailored pruning methodologies, meticulous nutrient and pest management, and the cultivation of a well-structured canopy through a comprehensive approach.

To ensure successful rejuvenation of mango trees, a series of systematic steps need to be followed. The initial phase entails the careful selection of trees suitable for rejuvenation based on specific criteria, such as age, canopy configuration, and fruit dimensions. Once chosen, the selected trees undergo pruning, which is advised to be carried out during the months of October and March.

It is crucial to exercise caution during the initial stage of rejuvenation, particularly when pruning mango trees excessively, particularly at the lower sections of primary and secondary branches, as this may lead to plant mortality and delayed emergence of new shoots. To mitigate such risks, pruning should primarily focus on the tertiary height level.

In instances where overcrowding occurs in mango orchards aged 20 to 30 years, wherein multiple stems are present, the rejuvenation process necessitates the complete removal of the central leader stem. This practice, known as center opening, facilitates the penetration of sunlight into the canopy, fosters the growth of productive branches, and reduces the occurrence of pests and diseases.

In the actual pruning process, selected trees are pruned to the desired height using chain saws or pole pruners. These machines provide a smooth cut with minimal injury (Anonymous, 2005).

The branches can also be cut by using traditional equipment's like sharp axe or sickle. In aftercare, the cut branches are collected and orchards get cleaned. Spraying of Chloropyriphos @ 5 ml per litre of water is to be done on entire pruned area as well as trunk. Application of paclobutrazol containing carbendazim and irrigation to pruned trees with 150 to 200 litre of water at an interval of 10 to 15 days is recommended.

In addition to modern pruning equipment like chain saws and pole pruners, traditional tools such as sharp axes or sickles can also be used to cut the branches. After pruning, it is essential to collect the cut branches and clean the orchard to maintain a healthy growing environment.

To protect the pruned trees from pests and diseases, it is recommended to spray Chloropyriphos at a rate of 5 ml per liter of water over the entire pruned area and trunk. Additionally, it is advisable to apply paclobutrazol containing carbendazim to the pruned trees and irrigate them with 150 to 200 liters of water at an interval of 10 to 15 days. This will help ensure optimal growth and productivity of the rejuvenated mango trees.

OBJECTIVES

To determine the perception of the mango growers about rejuvenation technology

METHODOLOGY

The present study was conducted in Gir Somnath district of Gujarat state during 2019-20. *Ex-post facto* research design was followed for carrying out the study. The simple random sampling was used for selection of taluka, village, and respondent. Gir Somnath district is comprised of nine talukas and out of them 4 talukas were selected randomly for the study *viz*: Talala, Kodinar, Una and Sutrapada. Three villages were selected randomly from the each selected taluka. Thus, total 12 villages were selected for the study. From each village, 10 respondents were selected randomly who was cultivating mango crop. Thus, 120 mango growers were selected as sample

An interview schedule was developed in accordance with the objectives of the study and it was pretested. The data of this study were collected with the help of structured interview schedule. The collected data was interpreted in order to make the finding meaningful.

Borate (2015) developed a scale that aimed to quantify the perception of mango growers regarding rejuvenation technology, which was based on a set of statements designed to elicit the opinions of respondents. The techniques for rejuvenation in the mango crop were provided by CISH (Central Institute of Subtropical Horticulture), Lucknow, which formed the basis for the development of the scale by Borate (2015) that was subsequently used to study the perception of mango growers towards the impact of rejuvenation technology. The scale comprised 9 sections and 40 statements that were designed to elicit the perception of mango growers towards the impacts of rejuvenation technology. The five-point continuum of strongly agree,

agree, undecided, disagree, and strongly disagree carried scores of 5, 4, 3, 2, and 1, respectively. The respondents' perception scores were calculated based on their answers to the statements, and they were then grouped into three categories using the mean plus standard deviation method. The study aimed to investigate the impact of rejuvenation technology on mango growers and provide insight into their perception of this technology.

RESULTS AND DISCUSSION

Perception is a critical aspect of the study of human behaviour, as it involves the interpretation of sensations that are dependent on past experiences. This mental phenomenon is

characterized by the association of various types of sensation and ideals to form a cohesive whole. Although perception cannot be directly observed in behaviour, it can be inferred from performance, particularly changes in performance or behaviour.

The Central Institute of Subtropical Horticulture (CISH) in Lucknow provided recommendations for various techniques of rejuvenation in mango cultivation. Subsequently, in 2015, Borate developed a scale to assess perceptions of these rejuvenation techniques, as well as associated aftercare and management practices. The responses of respondents regarding the rejuvenation technology are presented in Table 1.

Table 1: Statements pertaining about perception of respondents according to their responses about rejuvenation technology (n=120)

Sr. No.	Statements	SA (5) F (%)	A (4) F (%)	UD (3) F (%)	D (2) F (%)	SD (1) F (%)
1. Selection of trees for pruning						
1	Aged and poor yielding trees are good for rejuvenation.	20 (16.67)	39 (32.5)	21 (17.5)	25 (20.83)	15 (12.5)
2	Select trees where in sunlight does not enter inside the canopy due to dense canopy.	18 (15)	38 (31.67)	37 (30.83)	09 (07.50)	18 (15.00)
3	Rejuvenation technology is useful for the trees bearing small size fruits.	17 (14.17)	40 (33.33)	36 (30.00)	18 (15.00)	09 (07.50)
4	Age and yield of the tree should be considered while pruning.	16 (13.33)	42 (35)	34 (28.33)	25 (20.83)	03 (02.50)
2. Pruning Season						
5	Without bothering for the ensuing yield, trees should be pruned during October.	18 (15.00)	34 (28.33)	26 (21.67)	15 (12.50)	27 (22.50)
6	Non-flowering plants during season should be pruned.	16 (13.33)	14 (11.67)	26 (21.67)	34 (28.33)	30 (25.00)
7	Pruning during inflorescence leads to higher expenses on plant protection.	35 (29.17)	25 (20.83)	27 (22.50)	28 (23.33)	05 (04.17)
3. Height of pruning						
8	Trees should be pruned 10-12 feet above ground.	28 (23.33)	35 (29.17)	24 (20.00)	15 (12.50)	18 (15.00)
9	Canopy diameter needs to be considered while deciding the pruning height.	23 (19.67)	35 (29.17)	18 (15.00)	25 (20.83)	19 (15.83)
10	All the trees should be pruned at the same height.	16 (13.33)	38 (31.67)	29 (24.17)	24 (20.00)	13 (10.83)
4. Pruning density						
11	Heavy pruned plants are prone to the attack of stem borer.	15 (12.5)	19 (15.83)	27 (22.50)	28 (23.33)	31 (25.83)
12	Dieback is more observed in heavy pruned plants.	25 (20.83)	18 (15.00)	29 (24.17)	24 (20.00)	24 (20.00)
13	Light pruning helps in removing unwanted things such as parasites, dead wood etc.	14 (11.67)	19 (15.83)	51 (42.50)	24 (20.00)	12 (10.00)
14	Plant gets sufficient sunlight and aeration due to light pruning.	16 (13.33)	17 (14.17)	29 (24.17)	24 (20.00)	34 (28.33)
15	Light pruning reduces the incidence of pests and diseases.	20 (16.67)	24 (20.00)	27 (22.50)	29 (24.17)	20 (16.67)
16	Pruning helps in development of proper colour and quality of fruit.	14 (11.67)	16 (13.33)	57 (47.50)	20 (16.67)	13 (10.83)

Sr. No.	Statements	SA (5) F (%)	A (4) F (%)	UD (3) F (%)	D (2) F (%)	SD (1) F (%)
5. Pruning methods						
17	It should be seen that the tree gets minimum injury during pruning.	25 (20.83)	29 (24.17)	18 (15.00)	27 (22.50)	21 (17.50)
18	Use improved tools and implements for pruning.	15 (12.50)	35 (29.17)	21 (17.50)	31 (25.83)	18 (15.00)
19	Cut should be clean, smooth and slanting.	24 (04.17)	28 (23.33)	22 (18.33)	25 (20.83)	21 (17.50)
20	Straight cut leads to more injury to the plant.	05 (04.17)	15 (12.50)	27 (22.50)	32 (26.67)	41 (34.17)
6. After care						
21	Recommended insecticides need to be sprayed on the cut portion as well as the trunk of the tree.	21 (17.50)	29 (24.17)	24 (20.00)	25 (20.83)	21 (17.50)
22	Fungicides or Tar should be applied on the cut portion immediately after pruning.	16 (13.33)	28 (23.33)	26 (21.67)	35 (29.17)	15 (12.50)
23	Pruned plants should be irrigated at recommended interval.	18 (15.00)	26 (21.67)	27 (22.50)	24 (20.00)	25 (20.83)
24	There is adverse effect on the yield, if new shoots are not thinned.	13 (10.83)	25 (20.83)	26 (21.67)	27 (22.50)	29 (24.17)
25	Two-three healthy and vigorous shoots should be maintained while thinning shoots.	40 (33.33)	15 (12.50)	35 (29.17)	14 (11.67)	16 (13.33)
26	On the second sprouting of the retained shoots, apical buds should be pitched.	22 (18.33)	27 (22.50)	26 (21.67)	24 (20)	21 (17.50)
27	New shoots should be protected against pests and diseases.	23 (19.17)	24 (20.00)	27 (22.50)	29 (24.17)	17 (14.17)
7. Number of trees to be pruned						
28	Pruning should be done in stages, instead of pruning whole orchard at a time.	07 (05.83)	26 (21.67)	35 (29.17)	24 (20.00)	28 (23.33)
29	Pruning should be started from the plants facing East and then proceed towards west.	05 (04.17)	28 (23.33)	35 (29.17)	24 (20.00)	28 (23.33)
8. Expenses on pruning						
30	Pruning expenses depend on the canopy of the plant.	21 (17.50)	37 (30.83)	26 (21.66)	15 (12.50)	21 (17.50)
31	Expenses on pruning are greater than the production.	25 (20.83)	35 (29.17)	14 (11.67)	21 (17.50)	25 (20.83)
32	One with sound economic condition only can adopt rejuvenation technology.	18 (15.00)	24 (20.00)	29 (24.17)	24 (20.00)	25 (20.83)
33	One with good risk bearing capacity can adopt rejuvenation technology.	22 (18.33)	26 (21.67)	27 (22.50)	24 (20.00)	21 (17.50)
34	Lack of indepth knowledge of the technology leads to a loss.	33 (27.50)	26 (21.67)	19 (15.83)	18 (15.00)	24 (20.00)
9. Nutrient management						
35	Recommended nutrients with recommended dose lead to profuse growth of plants.	25 (20.83)	24 (20.00)	24 (20.00)	29 (24.17)	18 (15.00)
36	Trees should be fertigated during ensuing June, if pruning is practiced during October.	19 (15.83)	22 (18.33)	54 (45.00)	15 (12.50)	10 (08.33)
37	Fertigation in the month of June is also necessary for the plants pruned in March.	28 (23.33)	26 (21.67)	24 (20.00)	18 (15.00)	24 (20.00)
38	Proper blend of fertilizers and manures be maintained during fertigation.	24 (20.00)	25 (20.83)	27 (22.50)	20 (16.67)	24 (20.00)
39	Organic fertilizers alone do not yield expected output.	16 (13.33)	19 (15.83)	45 (37.50)	25 (20.83)	15 (12.50)
40	There is no alternative for chemical fertilizers for producing expected yield.	21 (17.50)	24 (20.00)	26 (21.67)	20 (16.67)	29 (24.17)

The data regarding perception of respondents about rejuvenation technology in mango as per the statements are given as below.

Table 2: Distribution of the respondents according to their perception of rejuvenation technology

(n=120)

Sr. No.	Level of perception	Respondents	
		Frequency	Percentage
1	Low level of perception (below 119.83 score)	23	19.17
2	Medium level of perception (119.83 to 159.17 score)	64	53.33
3	High level of perception (above 159.17 score)	33	27.50
Mean = 139.50		S.D. = 19.67	

Upon examining the data presented in Table 1 and Figure 1, it is evident that a significant proportion of the respondents, accounting for 53.33%, demonstrated a moderate level of perception regarding the rejuvenation technology. A smaller percentage of respondents, constituting 27.50%, exhibited a high level of perception, whereas only 19.17% of respondents were classified as having a low level of perception.

In light of these findings, it can be inferred that the majority of respondents held a moderate level of perception towards the rejuvenation technology in mango cultivation. Conversely, a lower proportion of respondents demonstrated either a high or low level of perception.

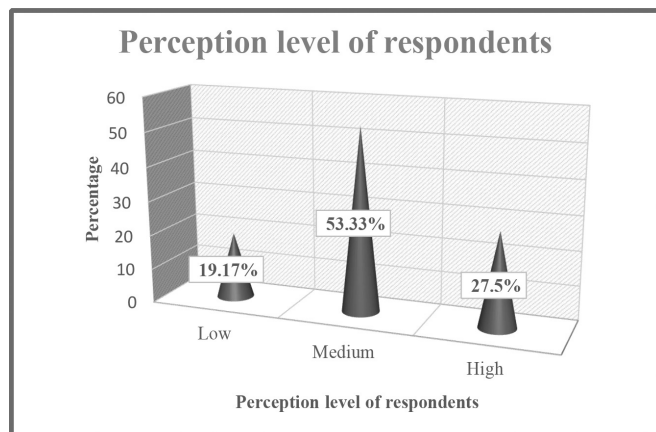


Fig. 1: Perception of the respondents about rejuvenation technology

This might be due to fact that most of the respondents had medium level of education, social participation, extension contact, innovativeness, scientific orientation, risk orientation, achievement motivation as well as economic motivation.

This finding was in partially conformity with findings of Farouque and Takeya (2007), Kumar (2007), Oyesola *et al.* (2011), Badhe (2012), Pynbianglang (2011), Gorfad (2012), Ram (2015), Kale *et al.* (2016), Dabhole (2017), Raksha and Meera (2017) and Zala (2018).

CONCLUSION

It can be concluded that majority (53.33 per cent) of the respondents had medium level of perception about the recommended mango rejuvenation technology, followed by 27.50 percent respondents had high level of perception about the recommended mango rejuvenation technology and 19.17 per cent respondents had low level of perception about the recommended mango rejuvenation technology.

To improve the perception of respondents about recommended mango rejuvenation technology, the extension agencies should make more efforts to bring up the positively related characteristics such as education, farm experience, social participation, annual income, extension contact, mass media exposure, innovativeness, scientific orientation, risk orientation, achievement motivation and economic motivation in order of its priority.

CONFLICT OF INTEREST

This is to declare that there is “No conflict of interest” among researcher.

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