

## EXTENT OF ADOPTION OF REJUVENATION TECHNOLOGY BY MANGO GROWERS

D. N. Padaliya<sup>1</sup>, N. B. Jadav<sup>2</sup> and D. A. Padaliya<sup>3</sup>

1&3 Ph. D. Scholar, Dept. of Agril. Extension, College of Agriculture, JAU, Junagadh - 362 001

2 Professor & Head, Dept. of Agril. Extension & Communication, College of Agriculture, JAU, Junagadh - 362 001

Email : dhavalpadaliya1811@gmail.com

### ABSTRACT

*Rejuvenation is the process of pruning and after pruning management of the plants to make them productive by utilizing the existing root system, which mean restoring the productive capacity of the fruit trees. A multistage, purposive and random sampling technique was selected for the study. The study was conducted in Gir Somnath district of Saurashtra region. Four taluka Talala, Kodinar, Una and Sutrapada were selected purposively and three villages were selected randomly from each selected talukas. Thus, a total of 12 villages were selected for the study. Ten mango growers were randomly selected from each village as respondents. Thus, 120 mango growers were selected for the study. The respondents were interviewed with the help of specially designed schedule. It is noticed that majority (55.00 per cent) of the respondents had medium level of adoption of rejuvenation techniques of mango, while 35.83 per cent and 9.17 per cent of the total respondents had low level and high level of adoption of rejuvenation techniques of mango, respectively. The technique of high intensity pruning was fully adopted by 46.67 per cent of total respondents, partially adopted by 37.50 per cent of total respondents and not adopted by 15.83 per cent respondents. Technique of light intensity pruning was fully adopted by 62.50 per cent of total respondents, partially adopted by 29.17 per cent of total respondents and not adopted by 08.33 per cent respondents.*

**Keywords:** adoption, productive, rejuvenation technology, pruning, mango growers

### INTRODUCTION

Mango (*Mangifera indica* L.) is one of the most ancient fruits of India and deserves to be the national fruit. It is the favourite fruit of almost every Indian and has been repeatedly acclaimed as the “King of Fruits”. 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.

The decline of trees starts with sparse appearance, yellowing and different type foliage symptoms, undergrowth and sickly appearance, dried-up top growth with small and less number of fruits. The branches of trees start to die from the top to downwards, ultimately resulted poor quality fruits (rough surface, thick skin and less juice). Such type of decline may be seen in whole orchards, on in a single tree or patches. It is a rare site to get any plantation free of this malady even intensity varies from plant to plant and from month to month in the same plant. The growers do not adopt the proper management practices in terms of plant protection, manuring, irrigation, mulching, pruning and the orchards become sick.

There are several reasons for the low productivity

and quality of mango. These reasons are senility of mango trees, predominant existing orchards are of seedling progenies, long gestation period, alternate bearing habit of mango, dominance of vegetative phase over reproductive phase, conventional spacing followed in many parts of the country, physiological disorders associated with mango and pest and disease problems (Dabhole, 2017).

### Why rejuvenation?

The existing mango orchards are planted with 10m X 10m spacing. The trees have grown tall and fruiting area has gone up. As the age advances trees become physiologically weak. Eventually, the fruit size also becomes small. Further, the plant protection and harvesting operations become costly, ineffective and tedious due to increased bearing height. Due to insufficient penetration of sunlight in the canopy, the photosynthesis is reduced drastically which in term reduces the carbohydrate accumulation and yield. It has been observed that such orchards have become vulnerable to climatic aberrations like off season rains, prolong cold wave and sudden change in temperature. Senile orchards have become liability to many farmers (Dabhole, 2017).

Management of senile orchard mango tree through rejuvenation, though demonstrated in early fifties by S. R. Gandhi in Maharashtra and V. N. Madhavrao in Tamilnadu,

did not gained popularity as the Indian farmers are still rigid in accepting the concept of beheading the trees because of sentimental issues about the mango.

### Rejuvenation technology

Rejuvenation is the process of pruning and after pruning management of the plants to make them productive by utilizing the existing root system, which mean restoring the productive capacity of the fruit trees. The rejuvenation makes the plant manageable, easy for adoption of appropriate package of practices, improving vigour and yield. Thus, rejuvenation in mango is adoption of suitable pruning, adequate nutrient and plant protection management, development of appropriate canopy and other management operations in a holistic manner. The recommended technology of rejuvenation included number of operations. The first step is the selection of trees for rejuvenation. It included the characteristics of the plant to be rejuvenated *i.e.* age of the plant, canopy and fruit size. The second practice in rejuvenation is pruning, in which it is recommended in month of October and March.

In case of intensity of pruning, if initial pruning is done severely at the lower height on the primary and secondary branches then the plant may die. On such plants, the development of new shoots is delay considerably. Hence, the plant should be pruned at tertiary height.

In the overcrowding of mango orchard of 20 to 30 years' age and where plants are having multiple stems, while rejuvenation of central leader stem is to completely remove it. This operation is called as centre opening which helps for better penetration of sunlight in the canopy and better development of productive branches with lesser incidence of pest and diseases. In the actual pruning process, the selected trees are pruned at the desirable height by using chain saw or pole pruner. These machines help in giving smooth cut with minimum 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 Black Japan Cultar containing carbendazim and irrigation to pruned trees with 150 to 200 litres of water at an interval of 10 to 15 days is recommended.

### Shoot management in rejuvenation technology

In the rejuvenation technology shoot management is one of the most important operation. It includes emergence of new shoots, thinning of new sprouts/ shoots and strengthening

of maintained new shoots.

### Emergence of new shoots

As soon as pruning for rejuvenation is performed, the dormant buds on stem are activated. It takes about 40-60 days for visible sprouting buds. The period depends upon age of plant and management after pruning. In the old plants, it may take even more period for shoot emergence.

### Thinning of new sprouts/ shoots

The management of emergence of sprouts is a critical operation in mango rejuvenation. The newly emerged shoots are thinned and maintained in such a fashion that they will developed all among the stem in all direction. Generally, the initial sprouts emerge near the cut portion of stem on the top 30 to 40 cm area. The rate of emergence is rapid. The sprouts produced are large in number. Strong 2-3 stems are maintained per stem. Further, rigorous and continuous removal of shoots should be undertaken so as to develop the new shoots on the lower sides of branches by sprouting the dormant buds.

### Strengthening of maintained new shoots

While maintain the new shoots, care is taken to strengthen the retained new shoots. On the retained new shoots, after second growth, apical bud is pinched. It helps to improve girth of new shoots. After pinching, only one shoot by produced axillary bud is allowed to grow and after it is fully developed, the apical bud is pinched again. In this fashion strong shoots are developed.

Plant protection after rejuvenation is the immense important. Negligence of farmers after pruning leads to death of the plant and good technology is blamed. Among the various pest like stem borer, shoot borer and diseases like anthracnose are important immediate threats and decided the success of rejuvenation. The other important aspect that included in the rejuvenation are number of plants should be rejuvenated, cost of rejuvenation and yield enhanced of orchard.

### OBJECTIVE

To determine the rejuvenation technology adopted by mango growers in study area

### 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 each selected taluka. Thus, total 12 villages were selected for the study. 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 findings meaningful.

## RESULTS AND DISCUSSION

The adoption index was used to measure the adoption of mango growers. The extent of adoption of respondents was calculated based on the score obtained by them. The respondents were classified into three categories based on mean and standard deviation. These data regarding adoption about recommended mango rejuvenation technology are presented in Table 1.

**Table 1: Distribution of respondents based on their adoption**

(n = 120)

Sr. No.	Adoption	Frequency	Percentage
1	Low level of adoption (below 51.38 score)	43	35.83
2	Medium level of adoption (51.38 to 70.96 score)	66	55.00
3	High level of adoption (above 70.96 score)	11	09.17
Mean = 61.17			S.D. = 9.79

From the Table 1, it is noticed that majority (55.00 per cent) of the respondents had medium level of adoption of rejuvenation techniques of mango, while 35.83 per cent and 9.17 per cent of the total respondents had low level and high level of adoption of rejuvenation techniques of mango,

respectively.

The results are in line with Patel (2006), Yadav (2006) Anonymous (2011) and Bhimani *et al.* (2019).

**Table 2: Distribution of respondents based on their technique wise adoption in rejuvenation technology of mango**

(n = 120)

Sr. No.	Rejuvenation technology	Respondents					
		Full		Partial		Non adoption	
		No.	Percent	No.	Percent	No.	Percent
1	High intensity pruning	56	46.67	45	37.50	19	15.83
2	Light intensity pruning	75	62.50	35	29.17	10	08.33
3	Center opening	04	03.33	07	05.84	109	90.83
4	Care after pruning	60	50.00	45	37.50	15	12.50
5	Shoot management	78	65.00	32	26.67	10	08.33
6	Plant protection	53	44.17	45	37.50	22	18.33

From the Table 2, The technique of high intensity pruning was fully adopted by 46.67 per cent of total respondents, partially adopted by 37.50 per cent of total respondents and not adopted by 15.83 per cent respondents. Technique of light intensity pruning was fully adopted by 62.50 per cent of total respondents, partially adopted by

29.17 per cent of total respondents and not adopted by 08.33 per cent respondents.

Technique of center opening was fully adopted by 3.33 per cent of the respondents and partially adopted by 5.84 per cent of the respondents and not adopted by 90.83 per

cent respondents. Technique of care after pruning was fully adopted by 50.00 per cent of the respondents and partially adopted by 37.50 per cent of the respondents and not adopted by 12.5 per cent respondents. Technique of shoot management was fully adopted by 65.00 per cent and partially adopted by 26.67 per cent and not adopted by 8.33 per cent respondents. And technique of plant protection was fully adopted by 44.17 per cent of the respondents and partially adopted by 37.50 per cent of the respondents and not adopted by 18.33 per cent respondent.

On the basis of above said discussion, it is concluded that most of the mango growers had medium level of overall adoption of rejuvenation techniques of mango, hence there is need to create more awareness about this techniques among the mango growers.

The results are somewhat similar with the results of Anonymous (2005), Anonymous (2006), Patel (2006), Yadav (2006), Dalsaniya (2010), Kesarkar (2010), Anonymous (2011), Humbal (2012), Koli (2012) and Datta (2018).

## CONCLUSION

It can be concluded that majority (55.00 per cent) of the respondents had medium level of adoption about the recommended mango rejuvenation technology. Majority (65.00 per cent) of the respondents had full adoption of shoot management, followed by 50.00 per cent and 46.67 per cent of respondents had full adoption of care after pruning and high intensity pruning, respectively. Majority (37.50 per cent) of the respondents had partial adoption of care after pruning, high intensity pruning and plant protection. This might be due to farmers understood rejuvenation technology of mango but do not have adequate understanding of scientific recommendations of mango rejuvenation techniques. The challenge is to disseminate the information from extension personnel to farmers. Dissemination of information and technology can be done by conducting more training programmes in this area.

The greater percentage (90.83 per cent) of respondents had non adoption of centre opening, followed by 18.33 per cent and 15.83 per cent of respondents had non adoption of plant protection and high intensity pruning, respectively. The challenge is to disseminate the information from extension personnel to farmers. In this regard, the profile characteristics of farmers, which were documented in the study, will serve as a guideline for improving the level of farmers' perception.

The findings may be worthwhile to the administrators and field workers in developing and implementing the programs for mango growers. Extension personnel and researchers can utilize the perception scale which is used

in this investigation to measure the level of perception of rejuvenation technology particularly, while scheduling training programmes in the area of mango.

## CONFLICT OF INTEREST

No conflict of interest among researchers.

## REFERENCES

- Anonymous, 2005. "Knowledge and adoption of agricultural technology of selected crops recommended by Dr. B.S.K.K.V., Dapoli." A Sub-Committee Report of Department of Extension Education, College of Agriculture, Dapoli submitted to B.S.K.K.V., Dapoli.
- Anonymous, 2006. "Study of non-cash (non-monetary) inputs adopted by farmers for rice and mango crops." A Sub-Committee Report of Department of Extension Education, College of Agriculture, Dapoli submitted to B.S.K.K.V., Dapoli.
- Anonymous, 2011. "Awareness and adoption of recommended plant protection measures by mango growers in Sindhudurg district." A sub-committee report of Department of Extension Education, College of Agriculture, Dapoli, submitted to B.S.K.K.V., Dapoli, Dist. Ratnagiri.
- Bhimani, G. J., Prajapati, M. R. and Parmar, H. C. (2019) Adoption of fruits and vegetable preservation technology by farm women of Surat district. *Guj. J. Ext. Edu.* 30(1):23-26.
- Dabhole, S. R. 2017. Perception of mango growers about rejuvenation techniques in mango. M. Sc. (Agri.) Thesis (Unpublished). B.S.K.K.V., Dapoli.
- Dalsaniya, A. M. 2010. Knowledge and adoption of kharif sesame growers about recommended kharif sesame production technology. M. Sc. (Agri.) Thesis (Unpublished). J.A.U., Junagadh.
- Datta, K. 2018. Knowledge and adoption of farmers about pomegranate production practices in Saurashtra region. M. Sc. (Agri.) Thesis (Unpublished). J.A.U., Junagadh.
- Humbal, U. N. 2012. Knowledge and adoption of castor as intercrop with groundnut in South Saurashtra agro climatic zone of Gujarat. M. Sc. (Agri.) Thesis (Unpublished). J.A.U., Junagadh.
- Kesarkar, S. 2010. Cashewnut cultivation in Goa state with special reference to organic cultivation practices.

- Ph. D. (Agri.) Thesis (Unpublished). B.S.K.K.V., Dapoli. growers' in relation to integrated pest management technology of Vadodara district of Gujarat state. Ph. D. (Agri.) Thesis (Unpublished). A.A.U., Anand.
- Koli, M. A. 2012. Knowledge and adoption of coconut production technology in Junagadh district of Gujarat State. M.Sc. (Agri). Thesis (Unpublished). J.A.U., Junagadh. Yadav, B. 2006. "A study on knowledge and adoption of improved production technology of mandarin by the farmers in Jhalrapatan Panchayat Samiti in Jhalawar district of Rajasthan." M. Sc. (Agri.) Thesis (Unpublished). R.A.U., Bikaner.
- Patel, A. C. 2006. Adoption dynamics of pigeon pea

---

*Received : May 2022 : Accepted : August 2022*