

An analysis on technology adoption by mango Growers in Konkan region of Maharashtra

¹KL Bachhao, ²SR Torane, ³KVMalshe and ⁴HV Borate

¹Ph.D. Scholar, Department of Agricultural Economics, DBSKKV, Dapoli, Maharashtra, India

²Professor and Head, Department of Agricultural Economics, DBSKKV, Dapoli, Maharashtra, India

³Agronomist, Regional Coconut Research Station, Bhatye, Ratnagiri, Maharashtra, India

⁴Professor (CAS), Department of Extension Education, DBSKKV, Dapoli, Maharashtra, India

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Corresponding Author: KL Bachhao

Abstract

The present study was undertaken in the Ratnagiri, Sindhudurg, Raigad and Thane- Palghar districts of the Konkan region of Maharashtra to assess the extent of adoption of mango production technologies. The extent of adoption was measured using the Technology Adoption Index (TAI). Primary data pertaining to the agricultural year 2023- 24 were used for the analysis. The average adoption index of low, medium, and high adopter groups was found to be 55.46, 65.41, and 76.88 per cent, respectively, while the overall adoption index was 65.10 per cent. The majority of mango growers (84 farmers, 70.00%) belonged to the medium adopter category, followed by low adopters (21 farmers, 17.50%) and high adopters (15 farmers, 12.50%). All the respondents (100%) adopted improved mango varieties, fertilizer management, insect- pest management, and disease management technologies. High adoption was also observed for harvesting practices (96.67%), planting 10- 15 per cent local varieties for pollination (95.83%), and foliar spray of plant growth regulators (94.17%). In contrast, intercropping was the least adopted technology, with only 32 farmers (26.67%) adopting it.

Keywords: Extent of adoption, mango technology, mango growers, Konkan regio

1. Introduction

Mango (*Mangifera indica*), popularly known as the “King of Fruits,” holds immense economic and cultural significance in India. The country leads global mango production, contributing nearly 40 per cent of the world’s total output. However, despite this dominance, India’s share in global mango exports remains relatively modest due to high domestic consumption, logistical constraints, and stringent international trade regulations. In this context, understanding the production and technology adoption aspects of mango cultivation becomes crucial for enhancing productivity and export competitiveness.

Mango is the national fruit of India and exhibits a strong production profile. According to the National Horticulture Board (2023), India produces about 20.87 million tonnes of mangoes from an area of 23.46 lakh hectares, accounting for 44.01 per cent of global mango production. In the Konkan region of Maharashtra, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (DBSKKV), Dapoli, since its establishment in 1972, has been actively engaged in comprehensive and multidisciplinary research on mango cultivation. The university’s research focus has largely been on rice and major horticultural crops, particularly mango, cashew, and coconut, which dominate the region. As a result of sustained research efforts, DBSKKV has developed and released several mango varieties, namely Ratna, Sindhu, Konkan Ruchi, Alphonso, Suvarna, Konkan Raja, and Konkan Samrat. Among these, Alphonso is a world-famous variety, widely cultivated in the Konkan region, and has been awarded the Geographical Indication (GI) tag. Other

varieties such as Ratna, Sindhu, and Konkan Ruchi are also popular and cultivated for specific purposes. In addition, the university has recommended more than 50 production and protection technologies for mango cultivation. In this context, it is imperative to assess the extent of adoption of these recommended mango technologies by growers in the Konkan region of Maharashtra.

2. Methodology

The present study was conducted in the Ratnagiri, Sindhudurg, Raigad, and Thane- Palghar districts of the Konkan region of Maharashtra during 2023- 24. A total sample of 120 mango growers was selected using a multistage sampling technique. Twenty-four villages were selected from twelve tahsils, and five mango growers were selected randomly from each village. The extent of technology adoption was measured using the Technology Adoption Index (TAI).

2.1 Analytical Tools

2.1.1 Technology Adoption Index

The Technology Adoption Index (TAI) for the selected mango growers was computed using the following formula

$$TAI = \frac{1}{n} \frac{AX_1}{RX_1} + \frac{AX_2}{RX_2} + \dots + \frac{AX_n}{RX_n}$$

Where,

n = No. of technologies in mango

AXi = Actual use of selected technology.

RXi = Recommended use of selected technology.

The Technology Adoption Index (TAI) for each sample farmer was calculated for all technologies, and then the selected sample farmers were classified into three Groups i.e. low adopters, medium adopters, and high adopters.

The classification was carried out using the arithmetic mean and standard deviation criteria as

1. Category I (low adopters) = less than AM - SD.
2. Category II (moderate adopters) = (AM - SD) to (AM + SD)
3. Category III (high adopters) = greater than AM + SD.

Where,

AM - Arithmetic mean of technology adoption index of all the farmers.

SD - Standard deviation of technology adoption index.

3. Results and Discussion

3.1 Distribution of Sample Mango Growers

The comprehensive Technology Adoption Index (TAI) of

each sample farmers were worked out and the distribution of selected mango growers was done according to technology adoption index (TAI). The distribution of sample farmers on the basis of technology adoption is given in Table 1. The technology adoption index for all the selected mango growers was worked out as per methodology and they were classified into three categories, viz., low adopters (<58.26% TAI), medium adopters (58.26 to 71.95% TAI) and high adopters (>71.95% TAI).

On the basis of technology adoption level, sample mango growers were grouped into three categories viz., low adopters that was 21 (17.5%), medium adopters 84 (70%) and high adopters 15 (12.5%). It was observed that, the majority of farmers had medium adoption level of mango production technologies. Hence efforts should be made to increase the extent of adoption of mango production technology to higher level.

Table 1: Classification of sample farmers on the basis of Technology Adoption Index (TAI)

Sr. No.	Adoption level (Category)	Technology Adoption Index (TAI)	Range of TAI (%)	No. of sample farmers	Percentage
1	Low	< 0.58	0 to 58.26	21	17.5
2	Medium	0.58 to 0.71	58.26 to 71.95	84	70
3	High	> 0.71	above 71.95	15	12.5

Overall technology adoption score for all technologies (%) = 65.10
(Standard Deviation = 6.84)

3.2 Distribution of farmers adopting various production technologies in mango

The information regarding the distribution of mango grower adopting various technologies in mango is given in Table 2.

Table 2: Frequency distribution of farmers regarding technology adoption

Sr. No.	Group of technology	No Adopters	Level of Adoption			Overall Adopters n=120
			Low Adopters n=21	Medium Adopters n=84	High Adopters n=15	
1	Improved variety	0 (0.0)	21 (17.50)	84 (70.00)	15 (12.50)	120 (100.00)
2	Spacing	36 (30.00)	10 (8.33)	62 (51.67)	12 (10.00)	84 (70.00)
3	Irrigation schedule	37 (30.83)	12 (10.00)	59 (49.17)	12 (10.00)	83 (69.17)
4	Fertilizer management	0 (0.0)	21 (17.50)	84 (70.00)	15 (12.50)	120 (100.00)
5	Weed management	31 (25.83)	13 (10.83)	61 (50.83)	15 (12.50)	89 (74.17)
6	Insect-pest management	0 (0.0)	21 (17.50)	84 (70.00)	15 (12.50)	120 (100.00)
7	Disease management	0 (0.0)	21 (17.50)	84 (70.00)	15 (12.50)	120 (100.00)
8	Foliar spray of plant growth regulators	7 (5.83)	18 (15.00)	80 (66.67)	15 (12.50)	113 (94.17)
9	Orchard rejuvenation	63 (52.50)	5 (4.17)	40 (33.33)	12 (10.00)	57 (47.50)
10	Harvesting	5 (4.17)	19 (15.83)	83 (69.17)	14 (11.67)	116 (96.67)
11	Integrated nutrient management	29 (24.17)	15 (12.50)	63 (52.50)	13 (10.83)	91 (75.83)
12	Intercropping	88 (73.33)	4 (3.33)	23 (19.17)	5 (4.17)	32 (26.67)
13	Planting 10 to 15 per cent local variety for pollination	5 (4.17)	20 (16.67)	81 (67.50)	14 (11.67)	115 (95.83)

From Table 2, it was observed that, at overall level, technologies such as improved variety, fertilizer management, insect-pest management, and disease management achieved full adoption, with all 120 (100%) of the farmers adopting these technologies. Other technologies like Harvesting (96.67%), Planting 10 to 15 per cent local variety for pollination (95.83%), and Foliar spray of plant growth regulators (94.17%) also showed high overall adoption with 116, 115, and 113 farmers adopting these technologies, respectively. However, certain technologies

showed relatively lower adoption rates. The least adopted technology was observed in intercropping (26.67%), it was adopted by only 32 farmers (26.67%)

3.3 Extent of Adoption of Selected Technologies in Production of Mango

Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli has given number of technologies for cultivation of mango. The information on the extent of selected group of technologies adopted by farmers is depicted in Table 3.

Table 3: Extent of adoption of selected technologies in production of mango

Sr. No.	Group of technologies	Level of Adoption			Overall Adopters n=120
		Low Adopters n=21	Medium Adopters n=84	High Adopters n=15	
1	Improved variety	100	100	100	100
2	Spacing	47.61	73.8	80	69.74
3	Irrigation schedule	50	83.69	85	80.4
4	Fertilizer management	73.9	83.59	92.16	82.86
5	Weed management	45.23	57.14	90	59.24
6	Insect-pest management	47.65	57.03	65.56	56.48
7	Disease management	51.98	66.06	75.41	65.94
8	Foliar spray of plant growth regulators	51.23	67.16	77.77	66.29
9	Orchard rejuvenation	11.9	24.4	46.66	27.66
10	Harvesting method/time	66.66	75.59	86.66	75.21
11	Integrated nutrient management	26.07	32.23	57.83	33.44
12	Intercropping	19.04	27.38	33.33	25.96
13	Planting 10 to 15 per cent local variety for pollination	80.47	73.03	88	76
	Average Adoption Index	55.45	65.41	76.88	65.10

The group of technologies selected for the study were improved varieties, spacing, irrigation schedule, fertilizer management, weed management, insect pest management, disease management, foliar spray of plant growth regulators, orchard rejuvenation, harvesting, integrated nutrient management, intercropping and planting 10 to 15 per cent local variety for pollination.

The adoption index of different technologies was worked out. It was observed from Table 3 that, the average adoption index of low, medium and high adopter group was 55.46, 65.41 and 76.88 per cent, respectively. Whereas, at overall level it was found 65.10 per cent. Among the different technologies at overall level, the adoption index was higher in use of improved varieties (100%) followed by fertilizer management (82.86%), irrigation schedule (80.4), Planting 10 to 15 per cent local variety for pollination (76.00%), harvesting method/time (75.21), spacing (69.74%) foliar spray of plant growth regulators (66.29%), disease management (65.94%), weed management (59.24%), insect-pest management (56.48%), integrated nutrient management (33.44%) orchard rejuvenation (27.66%) and intercropping (25.96%).

4. Conclusion

The present study examined the extent of adoption of recommended mango production technologies among growers in the Konkan region of Maharashtra using the Technology Adoption Index approach. The results revealed that the overall level of technology adoption was moderate, with an average adoption index of 65.10 per cent. A majority of the mango growers (70.00%) belonged to the medium adopter category, indicating partial adoption of recommended technologies rather than their complete and efficient use. The study further showed that technologies such as improved mango varieties, fertilizer management, insect- pest management, and disease management achieved complete adoption among all the respondents. High adoption levels were also observed for harvesting practices, planting of local varieties for pollination, and foliar application of plant growth regulators. In contrast, relatively low adoption was recorded for intercropping, orchard rejuvenation, and integrated nutrient management, suggesting the presence of technical, financial, and informational constraints in adopting these practices.

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