ADOPTION OF IMPROVED MANGO CULTIVATION TECHNOLOGY AMONG THE FARMERS OF SOUTHERN RAJASTHAN

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ABSTRACT

At the present time, India is the second largest producer of fruits in the world. Diversified agro-climate across the country provides a unique advantage for fruit production through extended period of availability and differential quality. Mango is the king of fruits. Currently, India is the largest producer of mango and the state Rajasthan is also considered to be the potential area for fruit growing. In Rajasthan, mango is mainly grown in Banswara, Dungarpur, Chittorgarh, Udaipur, Jaipur, Baran, Rajsamand districts. Therefore, present study was conducted in purposively selected Banswara & Dungarpur districts of southern Rajasthan. For the study Bagidora and Ghari panchayat samities of Banswara district and Dungarpur and Sangwara panchayat samities of Dungarpur district were selected on the basis of maximum area under mango cultivation. Four villages having maximum area under mango cultivation were selected from each identified panchayat samiti. Thus, in all sixteen villages were selected. To select the respondents, five tribal and five non-tribal mango growers were selected randomly from each identified village. Thus, in all 160 farmers (80 tribal and 80 non-tribal farmers) were selected. Thereafter, data were collected, analysed, tabulated and interpreted in the light of the objectives of the study. The result shows that majority of the respondents adopted mango cultivation technologies at medium level. The extent of adoption of non tribal mango grower was greater than tribal mango growers. It was also found that there was a significant difference in level of adoption between tribal and non-tribal respondents about mango cultivation technology.

INTRODUCTION

Fruits are of great importance in human nutrition. At present, next to China, India is the second largest producer of fruits. Diversified agro-climate across the country provides a unique advantage for fruit production through extended period of availability and differential quality. Mango is world's leading fruit-crop. India occupies 1.62 million hectares area under mango fruit with a production of 12.78 million tonnes, which is 37.6 per cent of total production under fruits. Today, India is the largest producer of mango and it has been estimated that Andhra Pradesh is the largest producing state contributing approximately 28.2 per cent of the total production in the country followed by Uttar Pradesh 19.70 per cent, Karnataka 7.7 per cent and West Bengal 5 per cent. Rajasthan is considered to be the potential area for fruit growing. In Rajasthan, mango is mainly grown in Banswara, Dungarpur, Chittorgarh, Udaipur, Jaipur, Baran, Rajsamand districts. The area under mango cultivation in the state of Rajasthan is 6407 hectares with good production potential, which could be further developed in the form of mango bowl.

In general, mango is consumed as dessert fruit. Its demand is increasing day by day because of its high nutritive value. Looking to the importance of mango fruit, it is essential that farmers of the state should be motivated for decision to adopt recommended cultivation on a large scale. With this consideration, the present study entitled "Adoption of improved cultivation technology among the farmers of Southern Rajasthan" was undertaken with the specific objectives.

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(i)   To study the extent of adoption of improved mango cultivation technology among the farmers.

(ii) To see the variation in the adoption of mango cultivation technology between tribal and non-tribal farmers.

RESEARCH METHODOLOGY

The present study was conducted in Banswara & Dungarpur districts of Southern Rajasthan. These districts were selected purposively on the basis of maximum area under mango cultivation in the southern Rajasthan. For the selection of Panchayat Samities, a complete list of all the panchayat samities of both the identified districts where the mango fruit is being grown extensively was prepared. From the list so prepared, Bagidora and Ghari panchayat samities of Banswara district and Dungarpur and Sangwara panchayat samities of Dungarpur district were selected on the basis of maximum area under mango cultivation. For selection of villages, four villages having maximum area under mango cultivation were selected from each identified panchayat samiti. Thus, in all sixteen villages were selected.

To select the respondents, a category-wise comprehensive list of tribal and non-tribal mango growers was prepared with the help of village Patwari and Agriculture supervisor of respective villages. The list so prepared, five tribal and five non-tribal mango growers were selected randomly from each identified village. Thus, in all 160 farmers (80 tribal and 80 non-tribal farmers) were included in the sample to study.

Thereafter, data were collected from the selected respondents by employing personal interview technique. Data so collected were analysed, tabulated and interpreted in the light of the objectives of the study.

RESULTS AND DISCUSSION

To get an overall view of adoption level, the respondents were categorized into three groups on the basis of calculated mean and standard deviation of the adoption score obtained by the respondents. The results are presented in Table 1.

Table 1. Distribution of the respondents on the basis of their adoption level of improved mango cultivation technology

n = 160

S. No.	Level of Adoption	Tribal farmers		Non-Tribal farmers		Total	
		f	%	f	%	f	%
1.	Low (below 19.45)	26	32.50	04	5.00	30	18.75
2.	Medium (19.45 to 38.23)	46	57.50	56	70.00	102	63.75
3.	High (above 38.23)	8	10.00	20	25.00	28	17.50
	Total	80	100.00	80	100.00	160	100.00

f = Frequency, % = Per cent

Data presented in Table 1 depict that majority (63.75%) of the total respondents were in the medium adoption group, whereas 18.75 per cent respondents were in low adoption group and remaining 17.50 per cent mango growers to be observed in the high level of adoption group about mango cultivation technology.

Further, among the categories of mango growers it was observed that in high adoption group, 10.00 per cent respondents were found to be from tribal farmers' category and 25.00 per cent respondents from non-tribal farmer's category. In the medium adoption group, 57.50 per cent respondents from tribal farmers' group and 70.00 per cent respondents from non tribal farmers' group. Where, in the low adoption group 32.50 and only 5.00 per cent respondents were in the tribal and non-tribal farmers' group respectively. From the above results it can be concluded that non tribal farmers possessed more level of adoption of mango cultivation technology than tribal farmers. It can be further concluded that 95.00 per cent respondents from non-tribal categories were to be observed either from medium or high adoption group. Whereas, 90.00 per cent tribal farmers adopted mango cultivation technology medium to lower level in the study area.

These findings are similar in line with the findings of Bhople *et al.* (1996) who found that 62 per cent of orange growers had adopted recommended cultivation practices of lwo to medium extent. Only 16 per cent of them were found

to be higher adopters. It was also noted that 22 per cent of orange growers were found to be low adopters. Similar findings have been also reported by Brar (2008).

Extent of adoption of respondents about different aspects of mango cultivation technology:

In order to know the extent of adoption of mango cultivation technology by the respondents, eleven major practices have been identified. The mean per cent scores were calculated for each practice and then the result about the same have been presented in Table 2.

The data presented in Table 2 indicate that the extent of adoption among non-tribal farmers about improved varieties of mango was 57.70 per cent, while in case of tribal farmers it was 40.42 per cent. Analysis of data clearly shows that majority of the respondents did not adopt the high yielding varieties namely, Neelam, Malika, and Amrapali, which are regular bearing varieties of mango.

Table 2. Extent of adoption of improved mango cultivation practices among the respondents

n = 160

S. No.	Practices	Tribal farmers		Non-Tribal farmers		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Improved varieties	40.42	11	57.70	10	49.06	11
2.	Vegetative propagation techniques	48.54	7	68.12	2	58.33	4
3.	Planting practices	52.70	3	65.21	5	58.95	3
4.	Irrigation management	56.87	1	65.31	4	61.09	2
5.	Inter-cropping	53.12	2	70.62	1	61.87	1
6.	Manure and fertilizers application	49.99	5	63.12	6	56.55	6
7.	Training and pruning methods	47.27	8	58.43	9	56.85	9
8.	Hoeing and weeding techniques	45.00	9	56.87	11	50.93	10
9.	Plant protection measures	51.25	4	62.49	7	56.87	5
10.	Harvesting and grading	49.58	6	59.79	8	54.68	7
11.	Value addition and marketing	41.45	10	65.63	3	53.54	8

MPS = Mean Per cent Score $rs = 0.51^{NS}$
NS = Non significant

The extent of adoption of vegetative propagation techniques, it was found that tribal and non-tribal farmers had 48.54 and 68.12 per cent adoption respectively. It was noted that nearly 40 per cent respondents were following veneer and stone grafting vegetative techniques in mango cultivation in sub-humid southern agro-climatic zone of Rajasthan. It was found that extent of adoption of planting practices in mango cultivation was 52.70 and 65.21 per cent in tribal and non tribal farmers respectively. It was observed during the analysis of data that majority of the respondents were using recommended size of pit, time and quantity of manure for planting of mango plants in orchard.

Further analysis of Table 2 shows that the extent of adoption regarding irrigation management among tribal and non-tribal respondents was 56.87 and 65.31 per cent respectively. It was noted that more than fifty per cent respondents were adopting suitable irrigation methods like, ring, basin and drip system for raising mango orchards. This aspect was ranked first by tribal and non-tribal farmers respectively. Regarding adoption of inter-cropping in mango orchard, it was found that tribal and non-tribal respondents had 53.12 and 70.62 per cent extent of adoption respectively and ranked second by tribal and first by non-tribal farmers. It means that majority of non-tribal farmers were taking vegetables and other crops like pea, moong, and urd as inter-crops in mango orchard during initial

years.

The extent of adoption regarding manure and fertilizers application was 49.99 and 63.12 per cent among tribal and non-tribal mango growers respectively. It was observed during analysis of data that majority of farmers of both the categories did not have full adoption about required quantity of fertilizers (NPK) per pit during 1-3 years aged mango plants. About 50 per cent of the respondents were using 10-12 kg FYM per plant as recommended by scientists for mango cultivation in the study area. The adoption about training and pruning techniques was placed at eighth rank by tribal farmers (47.27 MPS) and ninth by non-tribal farmers (63.12 MPS). In case of hoeing & weeding aspects, it was found that the extent of adoption in both the categories of respondents was more than 45 per cent. This practice was ranked ninth by tribal and eleventh by non-tribal respondents.

Further analysis of table indicates that adoption regarding plant protection measures was 51.25 and 62.49 per cent among tribal and non-tribal mango growers respectively. Majority of non-tribal mango growers were treating pits as per the scientific opinion before planting saplings of mango in pits. Whereas, application of plant protection chemicals as per the advise of the experts was not enthusiastic among tribal mango growers. It was found that extent of adoption in both the categories of respondents about harvesting and grading of mango was nearly 50 per cent. This aspect was ranked sixth by tribal and eight by non tribal mango growers. It was further observed that the extent of adoption about value addition and marketing was 41.45 and 65.63 per cent among tribal and non-tribal farmers respectively. The poor adoption about value addition and marketing of mango to fruit market among tribal may be due to lack of knowledge and poor socio-economic condition in the study area.

From the above discussion, it can be concluded that the extent of adoption in tribal farmers was 40.42 to 56.87 per cent, while in case of non tribal farmers the extent of adoption was 56.87 to 70.62 per cent in all the improved mango cultivation practices. Further, it was noted that non-tribal farmers had more extent of adoption than tribal farmers but there still exists a gap in the adoption of

improved mango cultivation technology. To improve the extent of adoption in both the categories of farmers, intensive training programmes should be organized timely and location specific in the study area. In recent years there have been many NGOs (Non-Government Organizations) and Government organizations which are running their programmes for the betterment of the people but the expected results were not visible yet in the study area.

Further analysis of Table 2 clearly shows the calculated value of rank order correlation (rs) was 0.51 found to be statistically non-significant at 5 per cent level of significance. This leads to the conclusion that there was no correlation between the ranks assigned by the tribal and non tribal farmers with respect to different aspects of mango cultivation.

The present findings are supported by the findings of Nainawat (1990) who reported that 57.84, 83.43, 50.00, 58.43, 80.62, 53.31 and 4.12 per cent of ber growers adopted the recommended improved varieties, spacing, soil treatment, manure and fertilizers application, irrigation, intercultural operations and plant protection measures respectively. Mohammad and Panjabi (1997) who found that maximum adoption gap were reported in propagation (35.56 %). This was followed by plant protection measures (22.23 %), planting techniques,(11.86 %) and harvesting & marketing (8.19 %). The data further reveal that minimum adoption gap was found in the cultural practices (3.06 %) , whereas no gap was found reported in case of use of mandarin varieties. Brar (2008) also reported that majority of farmers had high level of adoption about irrigation management (95.33 %) and low level of adoption about the post-harvest technology and marketing of kinnow (55.37 %) in the study area.

Comparison of adoption between tribal and non-tribal farmers about mango cultivation practices:

To find out the variation or similarity in the adoption of tribal and non tribal respondents about improved mango cultivation technology, 'Z' test was applied. The results were presented in Table 3.

Hypotheses:

NH01: There is no significant difference between

tribal and non-tribal farmers about adoption of improved mango cultivation technology.

RH1: There is significant difference between tribal and non-tribal farmers about adoption of improved mango cultivation technology.

Table 3.   Comparison of adoption between tribal and non-tribal farmers about improved mango cultivation technology

S. No.	Category of farmers	Mean	S.D.	'Z' Value
1	Tribal farmers	25.06	9.22	
2	Non-tribal farmers	32.65	7.91	5.593**

** Significant at 1 per cent level

Table 3 indicates that calculated 'Z' value was greater than its tabulated value at 1 per cent level of significance. Hence, research hypothesis (RH1) was accepted and null hypothesis (NH01) was rejected, which leads to the conclusion that there had been significant difference in level of adoption between tribal and non-tribal respondents regarding improved mango cultivation technology.

Further analysis of table shows that mean score value of non-tribal farmers in almost all of the practices is more than tribal farmers, which clearly indicates that non-tribal farmers had more adoption level than the tribal farmers about improved mango cultivation technology. It might be due to the fact that non-tribal farmers possessed more knowledge than tribal farmers about improved mango cultivation technology.

The findings are in line with the results of Meena and Sisodia (2003), who reported that there was significant difference in the adoption of improved guava cultivation practices between

literate and illiterate farmers. The level of adoption was noted hight in the category of literate farmers. This may be on account of possession of high extent of knowledge by the farmers who are treated as literates in the present investigation.

CONCLUSION

It can be concluded that 63.75 per cent of mango growers had medium level of adoption, whereas, 18.75 per cent respondents were reported from the group of low adoption level and 17.50 per cent respondents were in the high adoption level. It was further noted that the extent of adoption in tribal farmers was 40.42 to 56.87 per cent, whereas, in non-tribal farmers it was found to be from 56.87 to 70.62 per cent in all improved mango cultivation practices. It was further noted that there was a significant difference in level of adoption between tribal and non-tribal farmers.

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