Knowledge and Adoption Levels of Domestic and Export Market Oriented Mango Growers of Andhra Pradesh and their Training Needs

L. M. Ahire[1], N. Sandhya Shenoy[2] and P. Vijender Reddy[3]

Abstract

Considering the importance of mango cultivation in Andhra Pradesh for commercial gain, domestic usage and as an export potential, the present investigation was conducted to study the knowledge and adoption levels of the Domestic Market Oriented and Export Market Oriented mango growers of Krishna District of Andhra Pradesh and identify their training needs in the main areas of mango production technologies. Majority of the mango growers in both the categories were found to be medium level of adopters of mango production technologies. Regarding knowledge level, the export market oriented mango growers had a higher level of knowledge than the domestic market oriented mango growers. It was expressed by both the categories of mango growers that training must emphasize on pest management, diseases management and selection of varieties / hybrids and grafts. The export market oriented mango growers specifically felt that the "pre and post harvest technologies" were an important component in training for ensuring better shelf life and quality of fruits to fulfill export norms. These areas may be covered in training programmes for mango farmers to bridge the gap between the knowledge and adoption levels for higher yields and improved quality production of mango.

Introduction

Mango is an important fruit crop, occupying an area of 2.3 million hectares, which is over 42.6 percent of the total area under fruit crops, with an annual production of 12.7 million tonnes accounting for 47.08 percent of total fruit production in India (CMIE, 2010). Andhra Pradesh stands first among the mango

[1] Technical Officer, Post Graduate Studies Cell, National Academy of Agricultural Research Management, Rajendranagar, Hyderabad.

[2] Professor & Principal Scientist, Extension Systems Management Division, National Academy of Agricultural Research Management, Rajendranagar, Hyderabad.

[3] Technical Officer, Training Cell, National Academy of Agricultural Research Management, Rajendranagar, Hyderabad.

growing states in India with an area of 4,97,700 hectares and annual production of 2.6 million tonnes. Krishna district ranks first in area and production of mango among all the 22 districts of Andhra Pradesh (State Department of Andhra Pradesh). Training is an important activity to update the farmers to boost up mango production. At present there is no detailed study undertaken to train the mango growers in this district. Considering the importance of mango cultivation in Andhra Pradesh for commercial gains, domestic usage and as an export potential, the present investigation was conducted with the following specific objectives:

1. To study the knowledge and adoption levels of the Domestic Market Oriented (DMO) and Export Market Oriented (EMO) mango growers of Krishna district of Andhra Pradesh

2. To identify the training needs of Domestic Market Oriented and Export Market Oriented mango growers in the main areas of mango production technologies.

The findings of this study are expected to aid the training organizations and extension workers in the field of commercial mango production and horticultural development for need based technology transfer and help the policy makers to formulate need based training strategies to boost the level of mango production.

Methodology

The present study was undertaken, in Krishna district of Andhra Pradesh based on the maximum area under mango cultivation, using *ex-post facto* research design developed by Kerlinger (1973). Fourteen villages were selected from five mandals namely, Nuzvidu, Jaggaiahpeta, Mylavaram, Vatsavai and G.Konduru. Of these, Mylavaram, Nuzividu and Jaggaiahpeta farmers represented both domestic market and export market oriented mango production while mango growers from the other two mandals represented only domestic market oriented mango production. The names of mango growers were collected from the Horticultural Officers of respective Mandals and a total of 120 (80 domestic market and 40 export market oriented) mango growers were selected by using the random sampling method. Domestic market oriented mango growers are identified as the farmers who are producing mangoes to

serve the needs of the domestic markets and export market oriented mango growers as the farmers who are producing mangoes mainly to serve the needs of export markets. The data was collected from both the categories of mango growers through a structured interview schedule developed for the study. In order to measure the knowledge level of mango growers, the knowledge inventory of 48 practices for domestic market oriented mango growers and 62 practices for export market oriented mango growers was developed and it was pre tested in a non-sampled area. Each practice was scored on a dichotomous scale i.e., know/don't know with a score of '1' and '0' assigned respectively. The items were analyzed for the knowledge and adoption inventory of the main areas of mango production technologies by using the following formula.

$$\text{Knowledge Index} = \frac{\text{Sum of obtained knowledge score}}{\text{Sum of obtainable score}} \times 100$$

and

$$\text{Adoption Index} = \frac{\text{Sum of obtained adoption score}}{\text{Sum of obtainable score}} \times 100$$

The total mean scores for all main areas of mango production technologies on knowledge and adoption were calculated based on the scores obtained. The training needs of mango growers were assessed in the main areas of mango production technologies by using three point continuum i.e., 'Most required', 'Required' and 'Not required' with scores of 2, 1 and 0 respectively. The mango growers were asked to include any of three alternative responses against each item of the main areas of training depending upon the degree of training they were in need of. Further the mean score values were obtained separately for all main areas and sub areas of mango production technologies, then the items were ranked according to mean score values. The highest mean score was given the first rank; the next highest mean score the next rank and so on.

Results and Discussion

A) Knowledge Level

The knowledge index was calculated to enable comparison between the domestic and export market oriented mango growers and results are presented in Table-1.

Table 1: Classification of Mango Growers based on their Knowledge Index

Classification	Respondent Farmers			
	Domestic market oriented (N = 80)		Export market oriented (N = 40)	
	Frequency	Percentage	Frequency	Percentage
Low level	26	32.50	2	5.00
Medium level	46	57.50	34	85.00
High level	8	10.00	4	10.00
Total	**80**	**100.00**	**40**	**100.00**

The results as shown in Table 1 indicate that a higher percentage of export market oriented mango growers had higher knowledge levels as compared to domestic market oriented mango growers. While, one-third of domestic market oriented mango growers (32.50 %) had low-level of knowledge, only 5 per cent of the export market oriented mango growers were in this category. Eighty five per cent of export market oriented mango growers had medium level of knowledge, which is 27.50 per cent higher than the domestic market oriented mango growers. In case of higher level of knowledge, both the categories of mango growers had equal percentage. Therefore, it can be inferred that in spite of testing the knowledge on 62 practices for export market oriented mango growers as against 48 practices of domestic market oriented mango growers, the export market oriented mango growers had higher knowledge levels in the main areas of mango production technologies as compared to their counterparts. These findings are similar to the findings of Ratnakar (1990), Rao (1993), Ananth Chary (2001) and Javale and Nachane (1994).

B) Adoption Level

The comparison of domestic and export market oriented mango growers based on their adoption index is seen in Table-2.

Table 2: Classification of Mango Growers based on their adoption index

Classification	Respondent Farmers			
	Domestic market oriented (N = 80)		Export market oriented (N = 40)	
	Frequency	Percentage	Frequency	Percentage
Low level	11	13.75	1	2.50
Medium level	35	43.75	21	52.50
High level	34	42.50	18	45.00
Total	**80**	**100.00**	**40**	**100.00**

Table 2 indicates that very low percentage of export market oriented mango growers (2.50 %) were in the low-level adoption category as compared to 13.75 per cent of domestic market oriented mango growers. The export market oriented mango growers had higher percentage levels in medium and high-level adoption category as compared to their counterparts.

It was also observed that majority of the mango growers (both the categories) had medium level of adoption which indicates that most of them had partially adopted the mango production technologies and needed specialized training to improve their knowledge level for full adoption of these technologies. The results are supported by the findings of Sumathi and Annamalai (2003). The low level of adoption of mango production technologies (16.25%) in both the categories may be due to the low level of knowledge on particular mango production technologies. Therefore, the mango growers need to be addressed immediately to improve their knowledge levels in mango cultivation to be translated to a higher level of adoption, boosting the level of production. These findings are similar to that of Mallaraidu (1997) and Subramanyam (2002).

The training needs in the main areas of mango production technologies of domestic market oriented and export market oriented mango growers are shown in Table 3 and Table 4.

Training Needs of Domestic Market Oriented Mango Growers

The findings from Table 3 reveal that the domestic market oriented mango growers mostly preferred training in 'disease management' of mango production as they are producing the mangoes mainly to target the local domestic markets (mean score = 132.00, rank 1), followed by 'pest management' (mean score = 122.50, rank 2), 'fertilizer management' (mean score = 111.50, rank 3) and 'selection of varieties/hybrids and grafts' (mean score = 100.80, rank 4).

The least preferred areas for training by the domestic market oriented mango growers were 'land technologies' (mean score = 63.25, rank 8), 'irrigation management' (mean score = 80.50, rank 7), 'transportation and marketing' (mean score = 81.50, rank 6) and 'pre and post harvest technologies' (mean score = 98.50, rank 5) respectively.

Based on the perceptions of the domestic market oriented mango growers, it can be inferred that, 'disease management', 'insect-pest management', 'fertilizer

management', and 'selection of varieties / hybrids and grafts' were the most important areas for training which need to be addressed by the State Department of Horticulture or extension agencies for boosting the local markets and will also be helpful to the mango growers for better livelihoods. Similar observations are reported by Selvarani and Manoharan (2003).

Table 3: Training Needs of Domestic Market Oriented Mango Growers on Mango Production Technologies

(N = 80)

S. No.	Mango production technologies	Total scores	Rank	Mean score	Rank
I	Land technologies				
1	Selection of land for mango plantation	84	II	63.25	8
2	Layout for plantation	97	I		
3	Pit size	32	IV		
4	Pit digging season	40	III		
II	**Selection of varieties/hybrids and grafts**				
5	Recommended varieties/hybrids of mango for domestic cultivation	114	I	100.80	4
6	Recommended export varieties/hybrids from Andhra Pradesh approved by APEDA	117	II		
7	Propagation of mango grafts	117	II		
8	Selection of grafts for planting	77	IV		
9	Care at the time of planting of grafts	79	III		
III	**Fertilizer management**				
10	Application of manures and fertilizers	113	I	111.50	3
11	Method of application of manures and fertilizers	110	II		
IV	**Irrigation management**				
12	Irrigation in young age grafts	45	II	80.50	7
13	Irrigation after fruit set in mango and before harvesting	116	I		
V	**Pest management**				
14	Identification of pests	122	II	122.50	2
15	Pest control methods	123	I		
VI	**Disease management**				
16	Identification of diseases	131	II	132.00	1
17	Control methods of diseases	133	I		

S. No.	Mango production technologies	Total scores	Rank	Mean score	Rank
VII	**Pre-harvest and post-harvest technologies**				
18	Use of growth regulators/ripening/delay in ripening chemicals	133	II	98.50	5
19	Harvesting time	52	V		
20	Harvesting tools	45	VI		
21	Grading	96	IV		
22	Packing material and methods	125	III		
23	Infrastructure and storage	140	I		
VIII	**Transportation and marketing**				
24	Suitable mode for transportation of fruits	31	II	81.50	6
25	Marketing procedure and information about prices in different markets	132	I		

Training Needs of Export Market Oriented Mango Growers

It is evident from the study (Table 4) that the most preferred training needs for the export market oriented mango growers are 'pest management' (mean score = 58.00, rank 1), followed by 'disease management' (mean score = 56.50, rank 2), 'pre and post harvest technologies' (mean score = 52.66, rank 3) and 'selection of varieties / hybrids and grafts' (mean score = 50.00, rank 4).

The least preferred training areas by the export market oriented mango growers are, 'land technologies' (mean score = 39.50, rank 8), followed by 'irrigation management' (mean score= 49.50, rank 7), 'fertilizer management' (mean score = 46.50, rank 6) and 'transportation and marketing' (mean score = 46.50, rank 5).

Based on these findings it can be inferred that 'insect-pest management', 'disease management', 'pre and post harvest technologies' and 'selection of varieties or hybrids and grafts' were the most important training areas for export market oriented mango growers.

Therefore, it can be concluded from the studies that the major areas dealing with mango production technologies such as 'insect-pest management', 'disease management', 'pre and post harvest' and 'selection of varieties or hybrids and grafts' need to be emphasized more in the training programmes by the training

institutions dealing with farmers to increase the knowledge and adoption levels of export market oriented mango growers.

Table 4: Training Needs of Export Market Oriented Mango Growers on Mango Production Technologies

(N = 40)

S. No.	Mango production technologies	Total scores	Rank	Mean score	Rank
I	**Land technologies**				
1	Selection of land for mango plantation	36	III	39.50	8
2	Layout for plantation	44	II		
3	Pit size	48	I		
4	Pit digging season	30	IV		
II	**Selection of varieties/hybrids and grafts**				
5	Recommended varieties/hybrids of mango for domestic cultivation	59	II	50.00	4
6	Recommended export varieties/hybrids from Andhra Pradesh approved by APEDA	72	I		
7	Propagation of mango grafts	57	III		
8	Selection of grafts for planting	28	V		
9	Care at the time of planting of grafts	34	IV		
III	**Fertilizer management**				
10	Application of manures and fertilizers	39	II	46.00	6
11	Method of application of manures and fertilizers	53	I		
IV	**Irrigation management**				
12	Irrigation in young age grafts	22	II	43.50	7
13	Irrigation after fruit set in mango and before harvesting	65	I		
V	**Pest management**				
14	Identification of pests	58	I	58.00	1
15	Pest control methods	58	I		
VI	**Disease management**				
16	Identification of diseases	65	I	56.50	2
17	Control methods of diseases	48	II		
VII	**Pre-harvest and post-harvest technologies**				
18	Use of growth regulators/ripening/delay in ripening chemicals	66	II	52.66	3
19	Harvesting time	21	V		
20	Harvesting tools	31	IV		
21	Grading	66	II		
22	Packing material and methods	61	III		
23	Infrastructure and storage	71	I		

S. No.	Mango production technologies	Total scores	Rank	Mean score	Rank
VIII	**Transportation and marketing**				
24	Suitable mode for transportation of fruits	25	II	46.50	5
25	Marketing procedure and information about prices in different markets	68	I		

Conclusion

Majority of the mango growers in both the categories are medium level of adopters of mango production technologies. Regarding knowledge level, the export market oriented mango growers had higher level of knowledge than the domestic market oriented mango growers. Both the categories of farmers felt that the training on mango production technologies has to emphasize on the areas of "pest management", "diseases management" and "selection of varieties / hybrids and grafts". The export market oriented mango growers specifically felt that the "pre and post harvesting" is an important component in the training for ensuring better shelf life and quality of fruits to fulfill the export norms. These areas of mango production technologies may be covered in training programmes on priority basis for the mango farmers with the help of extension functionaries to bridge the gap between the knowledge and adoption levels for higher yields and improved quality production of mango to aid the growth of national GDP.

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