Knowledge Level of Beneficiaries Farmers as Compared to Non-Beneficiaries Farmers Regarding Turmeric Cultivation

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present study was conducted to know the knowledge level of beneficiaries farmers as compared to non-beneficiaries farmers about turmeric cultivation. The present study was conducted during the year 2015-16 and 2016-17 in Chhattisgarh plains. A sample size of 160 beneficiaries respondents, proportionate random methods were used and equal numbers of non-beneficiaries respondents were also selected randomly from the same villages. In this way, a total of 320 farmers were considered as respondents to respond as per the interview schedule design

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for the study. The study revealed that the majority of the beneficiaries (73.12%) and non-beneficiaries (75.62%) had a medium level of knowledge, followed by 19.38 percent of the beneficiaries and 20.63 percent of the non-beneficiaries had a low level of knowledge and 7.50 percent of the beneficiaries and 3.75 percent of the non-beneficiaries had a high knowledge about turmeric cultivation. The high level trend of knowledge of the respondents in beneficiaries need to be maintained in the same manner, whereas it would be desirable to develop knowledge of non-beneficiaries respondents to high level by involving them in extension programme i.e. training and demonstration etc.

1. INTRODUCTION

Horticulture play an important role in Indian agriculture and ultimately in Indian economy and nutrition. Horticulture plantation constitutes specialized form of farm business and is of highly commercial in nature. During last few decades Indian horticulture has changed from traditional to modern.

Horticulture sector account for 30 per cent of India's agricultural GDP from 8.5 per cent cropped area. It has over the years, emerged as a growth engine of agriculture, making a significant contribution to agricultural GDP. Diversified and accelerated agricultural growth is critically dependent upon the development of horticulture sector. It plays a vital role in improving the productivity of land, generating employment ameliorating the economic condition of farmers and entrepreneurs and enhancing exports. India's horticulture sector is fascinatingly diversified and covers a wide range of fruits, vegetables, tuber crops, flowers, mushroom, spices, medicinal and aromatic plants and variety of plantation crops [1].

India produces a wide variety of fruits, vegetables, root and tuber crops, flowers, ornamental plants, medicinal and aromatic plants, spices, condiments, plantation crops and mushrooms. These crops contributed a significant part of total agricultural produce in the country. All horticulture crops put together covered nearly 23.7 million ha area with an annual production of 268.8 million tonnes during 2012-13 [2]. Though these crops occupy about 10.7 per cent of the gross cropped area, they contribute over 30 per cent to the agricultural Gross Domestic Product and 37 per cent of total export of agricultural commodities in the country. The area and production of horticultural crops have increased considerably as compared to the situation a couple of decades ago. The area under horticultural crops were increased from 16.3 million ha in 2002-03 to 23.7 million ha in 2012-13 with the corresponding increase in production from 144.4 million tonnes to 268.8 million tones [2].

Turmeric is one of the important cash crops in India. India is the larger producer and exporter of turmeric in the world. Turmeric occupies about 6 per cent of the total area under spices and condiment products in India. In the year 2012-13 turmeric cultivation was 194 thousand ha with the production of 971 thousand tonnes. It reached to 233 thousand ha with the production of 1190 thousand tonnes in the year 2014-15 [3].

Chhattisgarh is also one of the important states of turmeric cultivation. In the Chhattisgarh state about 10.785 thousands ha with the production of 100.971 thousand tones in the year of 2021-22 [4].

2. MATERIALS AND METHODS

The present study was conducted during the year 2015-16 and 2016-17 in Chhattisgarh plains. The state comprises 27 districts, out of which 5 districts were selected purposively on the basis of highest area and highest number of turmeric growers. From each selected districts, 2 blocks were selected purposively for the study on the basis of maximum area and maximum number of turmeric growers. From each selected block, 4 villages were selected purposively on the basis of maximum area and maximum number of turmeric growers. From each selected villages, 4 beneficiaries and 4 non-beneficiaries were selected randomly for the comparison between both groups. In this way total 320 farmers were considered as respondents for the study. Data were collected by the personal interview method using structured schedule. An *Ex-post-facto* research design was used in the present investigation.

The knowledge test consisted of items called questions covering all the package of practices of turmeric cultivation. For the study of knowledge, 16 practices of turmeric cultivation were selected for the present study. The weightage of "2" for "full knowledge", "1" for "partial knowledge" and "0" for "no knowledge" were assigned for each practices. The total score obtained by the respondents from all 16 practices was the knowledge score of the individual respondent.

The respondents were classified into three categories *viz.* low, medium and high level of knowledge on the basis of mean and standard deviation.

Table 1. Three categories of knowledge level based on mean and standard deviation

Level of knowledge	Criteria
➢ Low	Below Mean – S.D.
➢ Medium	Between Mean ± S.D.
➢ High	Above Mean + S.D.

3. RESULTS AND DISCUSSION

Table 2 shows that out of total 74.38 per cent of the respondents had medium knowledge about turmeric cultivation, followed by 20.00 per cent had low knowledge and 5.62 per cent of them had high knowledge.

In case of beneficiaries 73.12 per cent of the respondents had medium knowledge, followed by 19.38 per cent had low knowledge and 7.50 per cent of them had high knowledge.

Similarly, in case of non-beneficiaries 75.62 per cent of the respondents had medium knowledge, followed by 20.63 per cent had low and 3.75 per cent of them had high knowledge.

It can be concluded that majority of the respondents had medium to high level of knowledge in case of beneficiaries, whereas it

was medium to low level of knowledge in non-beneficiaries. The findings are similar to the findings reported by Meena et al. [5] revealed that half of the respondents (50.00%) fell in medium level of knowledge group whereas, 35.83 per cent rose growers were observed in the low level of knowledge group and remaining 14.16 per cent respondents possessed high level of knowledge about improved rose cultivation technology. Thombre et al. [6] observed that majority of the grape growers (63.33%) had medium level of knowledge while, 23.33 per cent of them had low and only, 13.34 per cent of the grape growers had high level of knowledge.

3.1 Knowledge of Beneficiaries and Non-Beneficiaries Farmers Regarding Turmeric Cultivation

3.1.1 Beneficiaries

Knowledge is defined as a body understood information possessed by individual or by a culture. It is further explained that knowledge is the part of a persons information, which is in accordance with established fact. In the present investigation, the knowledge level of selected beneficiaries of NHM regarding turmeric cultivation was assessed and presented in Table 3. The findings reveal that majority of the respondents had full knowledge about improved cultivation practices like recommended varieties (91.25%), methods of planting (90.00%), ploughing and field preparation (79.38%), irrigation management (74.38%), inter-cropping (73.75%), harvesting time and methods (71.88%), recommended seed rate (60.00%), balance dose of fertilizers (57.50%), Earthin up operation (56.88%), Application of FYM (54.38%), seed treatment (50.00%), insect-pest management (46.25%), recommended spacing (45.00%), disease management (16.88%), chemicals for weed control (6.88%) and use of mulching (4.37%).

Table 2. Distribution of the respondents according to their overall knowledge level about turmeric cultivation

S. No.	Knowledge level	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	31	19.38	33	20.63	64	20.00
2	Medium	117	73.12	121	75.62	238	74.38
3	High	12	7.50	6	3.75	18	5.62

F – Frequency, % - Percentage

However, it was observed that the majority of the respondents had partial knowledge of improved cultivation practices like disease management (68.75%), recommended spacing (55.00%), application of FYM (45.62%), seed treatment and insect-pest management (45.00%), earthing up operation (43.12%), balance dose of fertilizers (42.50%), recommended seed rate (40.00%), harvesting time and methods (28.12%), inter-cropping (26.25%), irrigation management (25.62%), ploughing and field preparation (20.62%), chemicals for weed control (18.12%) and methods of planting (10.00%).

It was also found that the majority of the respondents had no knowledge about improved cultivation practices like use of mulching (95.63%), chemicals for weed control (75.00%), disease management (14.37%), recommended variety and insect-pest management (8.75%) and seed treatment (5.00%).

It can be concluded that majority of the beneficiaries farmers had fully knowledge about recommended variety of turmeric whereas, partially knowledge about disease management and they did not know about mulching in turmeric crops. This results in line with the findings of Sasane et al. [7] revealed that almost all of the brinjal growers had complete knowledge about selection of soil and preparatory tillage operations, transplanting irrigation management, harvesting. Majority of brinjal growers had complete knowledge about intercultural operations (91.67%), selection of seeds (87.50%), varieties (80.00%), nursery management (72.50 %), planting methods (90.00%) and spacing (87.50%) and 72.50 per cent farmers had complete knowledge about plant protection [8,9].

3.1.2 Non-beneficiaries

The knowledge of turmeric cultivation of selected non-beneficiaries was presented in Table 3. The data reveals that majority of the respondents had full knowledge about improved cultivation practices like useful method of planting (86.25%), recommended varieties (81.25%), ploughing and field preparation (75.62%), irrigation management (73.13%), inter-cropping (71.88%), harvesting time and methods (63.75%), earthing up operation (51.88%), recommended seed rate (51.25%), recommended spacing and application of FYM (41.88%), balance dose of fertilizers (38.75%), seed treatment (30.00%), insect-pest management (24.37%), disease management (13.12%) and mulching (1.88%) [10].

However, it was observed that the majority of the respondents had partial knowledge of improved cultivation practices like disease management (74.38%), insect-pest management (64.38%), balance dose of fertilizers (61.25%), seed treatment (60.62%), recommended spacing and application of FYM (58.12%), recommended seed rate (48.75%), earthing up operation (48.12%), harvesting time and methods (36.25%), inter-cropping (28.12%), irrigation management (26.88%), ploughing and field preparation (24.38%), chemicals for weed control (21.88%) and method of planting (13.75%) [11].

It was also found that the majority of the respondents had no knowledge about improved cultivation practices like mulching (98.12%), chemical for weed control (74.37%), recommended variety (18.75%), disease management (12.50%), insect-pest management (11.25%), seed treatment (9.38%) [12].

It can be concluded that majority of the non-beneficiaries farmers had fully knowledge about method of planting in turmeric crops while, partially knowledge about disease management and they did not know about mulching in turmeric crops. The results corroborates with the findings of Chavai et al. [13] reported that most of the turmeric growers had complete knowledge of drying of turmeric (100%), storage in gunny bags (99.09%), polishing by using drum (92.72%) and testing of boiled turmeric by hand pressing (92.72%). However, 58.18 per cent of them had complete knowledge in storage of turmeric incold storage, while 67.27 per cent of them had partial knowledge about scientific method of boiling.

3.2 Comparison between Beneficiaries and Non-Beneficiaries Farmers with Respect to their Knowledge Regarding Improved Turmeric Cultivation Practices

Table 4 reveals the difference between beneficiaries and non-beneficiaries respondents regarding turmeric cultivation. The calculated 'Z' value for field preparation was 0.801 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence it can be concluded that there is no difference between beneficiaries and non-beneficiaries with respect to field preparation.

Table 3. Distribution of the respondents according to their knowledge regarding improved turmeric cultivation practices

Sl. No.	Practices	Respondents					
		Beneficiaries			Non-beneficiaries		
		No knowledge	Partial knowledge	Full knowledge	No knowledge	Partial knowledge	Full knowledge
		F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
1	Field preparation	0 (0.00)	33 (20.62)	127 (79.38)	0 (0.00)	39 (24.38)	121 (75.62)
2	Improved variety	14 (8.75)	0 (0.00)	146 (91.25)	30 (18.75)	0 (0.00)	130 (81.25)
3	Seed rate	0 (0.00)	64 (40.00)	96 (60.00)	0 (0.00)	78 (48.75)	82 (51.25)
4	Method of planting	0 (0.00)	16 (10.00)	144 (90.00)	0 (0.00)	22 (13.75)	138 (86.25)
5	Spacing	0 (0.00)	88 (55.00)	72 (45.00)	0 (0.00)	93 (58.12)	67 (41.88)
6	Seed treatment	8 (5.00)	72 (45.00)	80 (50.00)	15 (9.38)	97 (60.62)	48 (30.00)
7	Earthing up	0 (0.00)	69 (43.12)	91 (56.88)	0 (0.00)	77 (48.12)	83 (51.88)
8	Inter-cropping	0 (0.00)	42 (26.25)	118 (73.75)	0 (0.00)	45 (28.12)	115 (71.88)
9	Mulching	153 (95.63)	0 (0.00)	7 (4.37)	157 (98.12)	0 (0.00)	3 (1.88)
10	Application of FYM	0 (0.00)	73 (45.62)	87 (54.38)	0 (0.00)	93 (58.12)	67 (41.88)
11	Application of fertilizers	0 (0.00)	68 (42.50)	92 (57.50)	0 (0.00)	98 (61.25)	62 (38.75)
12	Chemicals for weed control	120 (75.00)	29 (18.12)	11 (6.88)	119 (74.37)	35 (21.88)	6 (3.75)
13	Water management	0 (0.00)	41 (25.62)	119 (74.38)	0 (0.00)	43 (26.88)	117 (73.12)
14	Insect-pest control	14 (8.75)	72 (45.00)	74 (46.25)	18 (11.25)	103 (64.38)	39 (24.37)
15	Disease control	23 (14.37)	110 (68.75)	27 (16.88)	20 (12.50)	119 (74.38)	21 (13.12)
16	Harvesting stage	0 (0.00)	45 (28.12)	115 (71.88)	0 (0.00)	58 (36.25)	102 (63.75)

Figures in parentheses indicate the percentage

Table 4. Comparison between beneficiaries and non-beneficiaries farmers with respect to their knowledge regarding improved turmeric cultivation practices

Sl. No.	Practices	Mean value		'Z' value
		Beneficiaries	Non-beneficiaries	
1	Field preparation	1.794	1.756	0.801
2	Improved variety	1.825	1.625	2.904**
3	Seed rate	1.612	1.513	1.983*
4	Method of planting	1.900	1.863	1.035
5	Spacing	1.450	1.419	0.562
6	Seed treatment	1.450	1.206	3.677**
7	Earthing up	1.569	1.519	0.896
8	Inter-cropping	1.738	1.719	0.375
9	Mulching	0.088	0.038	1.984*
10	Application of FYM	1.544	1.419	2.248*
11	Application of fertilizers	1.575	1.388	3.406**
12	Chemicals for Weed control	0.319	0.294	0.394
13	Water management	1.744	1.725	0.372
14	Insect-pest control	1.375	1.131	3.552**
15	Disease control	1.025	1.006	0.310
16	Harvesting stage	1.713	1.638	1.412

***0.01 level of probability, *0.05 level of probability*

The calculated 'Z' value for improved variety was 2.904 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding improved variety.

The calculated 'Z' value for seed rate was 1.983 which was found to be significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries in relation to seed rate.

The calculated 'Z' value for method of planting was 1.035 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and no-beneficiaries regarding method of planting.

The calculated 'Z' value for spacing was 0.562 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries in relation to spacing.

The calculated 'Z' value for seed treatment was 3.677 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding seed treatment.

The calculated 'Z' value for earthing up was 0.896 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and no-beneficiaries with respect to earthing up.

The calculated 'Z' value for inter-cropping was 0.375 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and no-beneficiaries in relation to inter-cropping.

The calculated 'Z' value for mulching was 1.984 which was found to be significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries with respect to mulching.

The calculated 'Z' value for application of FYM was 2.248 which was found to be significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding application of FYM.

The calculated 'Z' value for Application of fertilizers was 3.406 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding application of fertilizers.

The calculated 'Z' value for chemicals of weed control was 0.394 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and no-beneficiaries with respect to chemical of weed control.

The calculated 'Z' value for water management was 0.372 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries in relation to water management.

The calculated 'Z' value for insect-pest control was 3.552 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding insect-pest control.

The calculated 'Z' value for disease control was 0.310 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and no-beneficiaries regarding disease control.

The calculated 'Z' value for harvesting stage was 1.412 which was found to be non-significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and no-beneficiaries regarding harvesting stage.

4. CONCLUSION

It was found that out of a total 74.38 percent of the respondents had medium knowledge about turmeric cultivation, followed by 20.00 percent had low and 5.62 percent of them had high knowledge level. In the case of beneficiaries 73.12 percent of the respondents had medium knowledge level, followed by 19.38 percent had low knowledge and 7.50 percent of them having high knowledge level.Similarly, in the case of non-beneficiaries 75.62 percent of the respondents had medium knowledge, followed by 20.63 percent had low and 3.75 percent of them had a high knowledge level. According to practice wise, it was also found that both types of respondents (beneficiary and non-beneficiary) possessed maximum knowledge regarding the method of planting of turmeric crops, respectively. Similarly the least knowledge was possessed about the mulching of turmeric crops. The probable reason for this trend may be the fact that the majority of the beneficiaries respondents were frequently taught the recommended cultivation practices regarding turmeric. This coupled with the respondents regular contact with extension personnel and scientists seeking advice and clarifying doubts on the topics they had heard through different sources made them to have more knowledge, whereas the non-beneficiaries respondents were not having frequently contact with the extension personnel and lack of information about turmeric production technology. Hence, they had low level of knowledge.

DISCLAIMER

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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