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Knowledge and adoption level of turmeric cultivation practices in Mahabubabad, Telangana, India

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Abstract

The present study was carried to assess knowledge and adoption level of turmeric cultivation technologies in Mahabubabad district of Telangana. A total of 120 farmers were selected from two mandals of the district where turmeric is an important crop. An exploratory research design was used to evaluate their responses. The results indicated that, majority of the turmeric growers (48.33%) had a medium level of knowledge regarding turmeric cultivation practices. High awareness was observed in practices such as sowing time (90.83%), soil type (95.83%), selection of varieties (98.33%) and plant protection measures (88.33%). Despite this, limited understanding was found on certain practices like recommended fertilizer application for turmeric crop such as basal dose of NPK. In terms of adoption, 75.50% of respondents were categorized under Knowledge category. Soil selection, field preparation practices like deep ploughing, method of sowing - Ridge and furrow or Broad Bed Furrow (BBF) and some post harvesting methods showed high level of adoption, while, plant protection measures, recommended fertilizer application, weed control had relatively lower adoption rates in spite of possessing adequate knowledge among farmers. Existing gap between awareness and practical application highlights the need for more targeted extension services. Strengthening farmer trainings and demonstration programmes, supplying post-harvest management implements, and hands-on experience can enhance the actual implementation of recommended practices, thereby improving the productivity of the crop in the district.

Keywords: Adoption, Knowledge, Turmeric cultivation

1. Introduction

Turmeric (*Curcuma longa* L.), famously known as Golden Spice of India or Indian Saffron is an important spice crop grown mainly during *Kharif* season in the subcontinent. The subcontinent grown spices are known for their flavor and aroma in domestic market and in global markets. Turmeric evolved into an essential part of the culinary preparations because of medicinal properties, ability to add flavor and taste to foods and beverages.

India dominates the world turmeric production scenario contributing 80% followed by China (8%), Myanmar (4%), Nigeria (3%) and Bangladesh (3%). India is the largest producer, consumer, and exporter of turmeric in the world. In 2023-24, India had exported 1.62 lakh tonnes of turmeric compared to 1.70 lakh tonnes in the previous year. Indian turmeric is considered to be of the best quality due to its high curcumin content, making it increasingly popular in medicinal and cosmetic applications.

Telangana, Tamil Nadu, Karnataka, Maharashtra, and Andhra Pradesh are the major turmeric growing states in India. Telangana is one of the leading turmeric producing states and in Telangana, during 2024-25, Nizamabad with 9284 ha recorded highest acreage of the crop followed by Jagtial (3931 ha), Nirmal (2243 ha), Vikarabad (629 ha), Warangal (340 ha) and Mahabubabad (149 ha).

1.1 Objectives of the study

To find out the level of knowledge and adoption of turmeric cultivation practices among Farmers.

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1.2 Scope of the study

The present investigation was undertaken to measure the level of knowledge among farmers regarding various production recommendations in turmeric cultivation and the extent of adoption of these production recommendations by the farmers. Besides this, the study was also focused to reveal the relationship of personal, socio-economic and psychological characteristics of turmeric farmers with their level of knowledge and adoption of selected production technologies by applying an ex-post facto research design. The findings could be utilized by administrators, scientists and the extension department personnel to understand the existing status of turmeric farmers with respect to knowledge and adoption behaviour of recommended package of practices which would facilitate in planning and organizing effective educational programmes to increase turmeric production.

2. Research method

2.1. Research Design

Ex-post facto research design combined with exploratory type of research design was used as the selected phenomena have already occurred and the researcher had no control over the same.

2.2. Sampling Design

2.2.1. Study area:

An ex-post facto research design, combined with an exploratory approach, was employed for this study. This design was considered appropriate as the phenomena under investigation had already occurred, and the researcher had no direct control

over the variables. As the investigator hails from the same district and being familiar with local language had helped the investigators in building quick rapport and facilitated in depth study.

2.2.2. Selection of the district

The Mahabubabad district of Telangana State was purposively selected as the investigator was working at KVK, Malyal, Mahabubabad during the study period.

2.2.3. Selection of mandals

Out of 16 mandals in Mahabubabad district, two mandals viz., Kesamudram and Neellikuduru were selected purposively based on turmeric crop coverage.

2.2.4. Selection of villages and respondents

In each mandal, two villages were selected and from each village, sixty farmers *i.e.*, a total of 120 farmers were selected for the study.

2.2.5 Data and analytical procedures

Primary data were collected through an open-ended schedule designed to capture farmers' knowledge and adoption in turmeric cultivation. The responses were systematically categorized, and farmers' views were analyzed based on frequency and percentage distribution.

3. Results and Discussion

Knowledge level and adoption of turmeric cultivation technologies by farmers

Table 1: Knowledge level and adoption of turmeric technologies

S. No.	Cultivation practice	Knowledge level		Adoption level	
		Frequency	Percentage	Frequency	Percentage
1	Sowing May - June sowing	109	90.83	94	78.33
2	Soil type Well drained, fertile soils	115	95.83	91	75.83
3	Method of sowing and seed rate (Rhizomes) Ridges and Furrow or Broad Bed & Furrow Seed rate 7.5 to 10 quintals /ha	102	85.00	90	75.00
4	Preparatory tillage Clean and deep tillage practice and 3-4 times ploughing to get fine tilth Add well decomposed FYM @ 25 tonnes /ha	95	79.16	84	70.00
5	Varieties Duggirala red, Salem, ACC 48, ACC 79, Rajendra Sonali and others	118	98.33	110	91.66
6	Spacing Raised bed:30 cm row to row and 15 cm plant to plant Ridge and furrow: 45 cm row to row and 20 cm plant to plant	92	76.66	88	73.33
7	Fertilizer management Nitrogen: 375- 500 kg/ha SSP: 375 - 500 kg/ha MOP: 187.5 kg/ha	90	75.00	72	60.00
8	Water management (Irrigation) Irrigation should be done at an interval of 8 to 10 days as per the soil and crop requirement and drip system in raised bed	84	70.00	70	58.33
9	Weed management & Intercultural operations For weed management, spraying of Pendimethalin @ 1875 ml/ha, 24 to 48 hours after sowing Earthing up should be done upto 90 days after sowing	102	85.00	88	73.33
10	Plant protection measures For control of leaf spot/leaf blotch disease, spraying of propiconazole @ 1ml/1lt of water (or) Carbendazim @ 1g/lt and mancozeb @ 2.5 g/lt For control of rhizome rot, drenching with ridomil MZ @ 2g/lt of water (or) captan @ 3g /lt of water. For control of rhizome fly, application of carbofuran granules @ 25kg/ha and 12.5 kg/ha neem cake application	106	88.33	88	73.33
11	Maturity and harvesting For turmeric, average time required is about 210 to 270 days and Yellowing of leaves followed by 50%drying is the major indication of harvesting stage of turmeric.	108	90.00	92	76.66
12	Processing Boiling of finger and mother rhizomes separately and drying of boiled turmeric under sunlight	91	75.83	82	68.33

Knowledge and adoption level of turmeric growers with respect to improved cultivation practices

1. Sowing time

From Table-1 it is clear that 90.83 per cent of turmeric farmers had complete knowledge about sowing time (suitable time of sowing is May to June) and it was adopted by 78.33 per cent of

farmers. The gap between knowledge and adoption suggests that, although awareness is widespread, certain practical constraints, such as unavailability of labor, delayed onset of monsoon or lack of timely resources, may hinder farmers from implementing their knowledge in practice. Strengthening extension services and input support during the sowing season

could help bridge this gap and enhance overall productivity.

2. Soil type

From Table-1 it is clear that 95.83 per cent of the turmeric Farmers had complete knowledge about soil type (well drained soil) and it is adopted by 75.83 per cent of farmers.

This could be due to the fact that, farmers might have gathered knowledge about improved cultivation practices since the respondents had high farming experience.

3. Method of sowing and seed rate

Eighty five per cent of the turmeric farmers (Table-1) had complete knowledge about Method of sowing and seed rate in field. However, only 75.00 per cent among them had adopted the method of sowing and seed rate correctly.

These kinds of results were due to unavailability of quality seed material, lack of proper machinery or variations in field conditions. Strengthening farmer training, ensuring timely supply of quality seed rhizomes, and promoting demonstrations could further enhance the adoption of proper sowing techniques and seed rate management for improved productivity.

4. Preparatory tillage

It is clear from the Table -1, that, 79.16 per cent of the turmeric farmers had complete knowledge about timing and number of ploughings of the field to get required tilth, addition of well decomposed FYM @ 25 tonnes per hectare and 75.00% of the farmers had adopted clean and deep tillage practices. The difference between knowledge and adoption could be attributed to factors such as limited availability of farm machinery, shortage of labor, inadequate organic manure supply. Encouraging mechanization, timely availability of FYM, and continuous farmer training programmes can help increase the adoption of proper tillage practices leading to improved soil health and better crop establishment.

5. Varieties

From Table-1, it is clear that 98.33 per cent of the turmeric farmers had knowledge about turmeric varieties. About 91.66 per cent among them had adopted correct turmeric varieties. The small gap may be due to constraints such as limited seed availability, availability of new varieties, high input costs, or farmers' reliance on traditional local varieties. Strengthening varietal seed supply chains and providing timely technical support could help even better adoption.

6. Spacing

It was observed that 76.66 per cent of the turmeric farmers (Table-1) had knowledge about recommended spacing for turmeric cultivation. About 73.33 per cent among them had adopted the varieties and spacing maintained for turmeric correctly.

Majority of farmers expressed practical challenges like limited land availability, use of traditional planting methods, or lack of proper machinery for uniform spacing. To address this, extension agencies and agricultural officers should strengthen field demonstrations and awareness programmes that emphasize the importance of maintaining optimal spacing for achieving high yields and better crop quality.

7. Fertilizer Management

It was observed that, nearly 76.66 per cent (Table-1) of turmeric growers knew time and dose of fertilizer application and 73.33 per cent among them had adopted the correct fertilizer

management which could be due to their rich experience in farming, hereditary knowledge about farm yard manure (FYM) application, frequent consultations with horticulture related functionaries to seek improved and recent information. However, organizing regular training programmes can further improve nutrient management efficiency and enhance turmeric yield sustainably.

8. Water management

Eighty five per cent of the turmeric farmers knew about recommended and modern methods of irrigation whereas only 73.33 per cent of turmeric growers adopted the recommended water management practices (Table-1). The probable reason for higher adoption is farming experience, following advice of progressive farmers to avoid rhizome rot problem.

9. Plant protection measures

Considerable percentage of farmers (88.33) knew about the plant protection measures against leaf spot/leaf blotch disease, rhizome rot, rhizome fly and other pests and diseases. 73.33 per cent of the respondents adopted timely plant protection measures (Table-1). Experience in turmeric farming, good education, and better extension contacts with concerned field officers contributed for higher adoption level. The adoption level would have also got influenced by the para extension services and marketing strategies of private pesticide dealers to whom farmers usually bring specimens of pests and diseases. Dealers identify the specimens, offer a suitable pesticide for sale.

10. Weed management

Eighty five per cent of the turmeric farmers knew about time of weeding, chemical weed management practices and 73.33 per cent of them adopted timely weed management and intercultural operations (Table-1). Higher level of knowledge and adoption was due to pesticide dealers, better education and exposure visits to progressive farmers' fields.

9. Maturity and harvesting

It was observed that 90.00% of the turmeric growers had correct knowledge about maturity and harvesting time of turmeric, different methods of harvesting and indicators of turmeric maturity. 76.66 per cent of farmers adopted them (Table-1). Farmers had knowledge about leaving turmeric rhizomes in field after cutting of the pseudostems. These are the major common practices that are being practiced in turmeric crop as it is the stage which decides the quality of the turmeric.

11. Processing

Majority (75.83%) of the farmers had correct knowledge about the processing of turmeric, and only 68.33 per cent adopted because of limited access to modern processing facilities, higher labour costs or lack of technical support. Promoting small-scale processing units and providing hands-on training could further improve adoption, enhance efficiency, and increase profitability among turmeric farmers.

Table 2: Knowledge level of farmers on turmeric technologies in Mahabubabad, Telangana

S. No.	Items	Category		
		Low (up to 33.33)	Medium (33.33 to 66.66)	High (above 66.66)
1.	Frequency	16	58	46
2.	Percentage	13.33	48.33	38.34

Among the turmeric growers, 48.33 per cent had medium level of knowledge about cultivation practices, while 38.34 per cent had high level of knowledge. Only 13.33 per cent had low level of knowledge (Table-2) about recommended practices of turmeric cultivation. Thus, it was found that majority of turmeric growers 48.33 per cent had medium level of knowledge on improved cultivation practices such as land preparation, seed selection, fertilizer management, and pest control. Similar observations were made by Gopiram (2005) ^[4]. The medium level of knowledge could be attributed to factors like partial exposure to extension services, informal knowledge sharing among farmers, and practical experience gained over years of cultivation. 38.44 per cent of farmers with high knowledge levels indicates the need for further strengthening of agricultural trainings, demonstrations and awareness programmes. Enhancing access to technical guidance and continuous interaction with agricultural experts can help uplift farmers from medium to higher knowledge levels, leading to improved productivity and adoption of recommended practices.

Table 3: Field level adoption of turmeric technologies in Mahabubabad, Telangana

S. No.	Items	Low	Medium	High
1.	Frequency	34	62	24
2.	Percentage	28.34	51.66	20.00

Majority of the respondents of turmeric growers (51.66%) resorted to medium level of adoption of turmeric cultivation practices. Low level of adoption was exhibited by 28.34 per cent of the respondents. Only 20.00 per cent of the respondents showed high level of adoption. These results are in accordance with the findings of Kulkarni (1999) ^[6], Tekale and Thakare (2018).

Medium level of adoption suggests that farmers possess practical knowledge but may face barriers such as limited resources, lack of technical guidance, or inadequate access to quality inputs that prevent full adoption. To enhance adoption levels, continuous training, field demonstrations, encouragement to FPOs and support from agricultural extension agencies is essential. Encouraging farmer-to-farmer learning and timely dissemination of updated cultivation techniques can further promote higher adoption rates and improve overall turmeric productivity.

4. Conclusion

The current findings indicate that while turmeric growers demonstrated high levels of knowledge in practices like sowing time (90.83%), soil type (95.83%), selection of varieties (98.33%) and plant protection measures (88.33%). In terms of actual adoption, practices like selection of suitable varieties, sowing time showed higher adoption levels. However, the adoption practices such as timely recommended fertilizer application, control of pest and diseases and chemical weed management are relatively medium to low, despite growers being aware of them. This indicates that while awareness is present, the dissemination of knowledge into reliable practice remains limited in certain areas. In such cases, extension strategies must focus not only on creating awareness but also on enabling farmers to adopt the right practices more effectively and efficiently.

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