



RESEARCH ARTICLE

# Knowledge Level on Recommended Cultivation Practices for Tomato among the Tomato Growers in Madurai District

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## ABSTRACT

Tomato is one of the most important vegetable crops and it plays significant role in daily diet - and hence, it is considered as a vital commercial and dietary vegetable. During 2017-2018, the area under tomato cultivation in Tamil Nadu was 29.08 ha. Even though the production is high, the farmers are struggling to meet out the demand of the growing population. The study on the knowledge level of the farmers on recommended cultivation practices is beneficial to assess the technology reach about the recommended cultivation practices of tomato. The study was conducted in the Chellampatti block of Madurai district. Ninety respondents were selected by employing proportionate random sampling technique. The Statistical tools such as mean, standard deviation and percentage analysis were used. Majority of the respondents (56.67%) had medium level of knowledge on recommended practices of tomato cultivation followed by high (22.22%) and low (21.11%) knowledge. Majority of the tomato growers (54.44%) had medium level of adoption of tomato cultivation practices followed by low (30.00%) and high (15.56%) level of adoption. Cent percentage of the respondents were possessed with the correct knowledge on practices like season of sowing, farmyard Manure, planting material, transplanting, spacing, manual weeding and symptom of harvest. They had insufficient knowledge on practices like seed treatment with bio-fertilizer (22.22%), damping-off (33.33%), tomato spotted wilt (41.11%) and weedicide application (44.44%).

**Key words :** *Tomato growers; Recommended cultivation practices; Knowledge level*

## INTRODUCTION

India ranks second in the world's tomato-producing countries, next to China. The production of tomato during 2017-2018 was around 197 lakh tonnes as against 207 lakh tonnes in 2016 -2017 which is about 3 per cent higher than the last five years average production. The productivity of tomato in India was 25.04 MT ha<sup>-1</sup> in the year 2017-18. Tamil Nadu contributes a share of tomato cultivation as 29.08 ha area and the production as 887.08 MT in the year 2017-18 and the productivity of tomato was 30.51 MT ha<sup>-1</sup> (*Horticultural Statistics at a Glance, 2018*). The demand for tomato is increasing day by day and we are in a need to feed the growing population. Knowledge is a fundamental key for adopting any innovation. The benefits and importance of any innovation is understood by the knowledge. Knowledge of a person is not only acquired by learning but also by experience. It could be the doorway for adoption. Hence an attempt was

made to assess the knowledge level of the tomato growers on tomato cultivation practices viz., crop improvement practices, crop management practices, plant protection practices, physiological disorders and harvesting practices.

## MATERIALS AND METHODS

The study was conducted in Panniyan and Karumathur villages of Chellampatti block of Madurai district. The present study was confined to *expost-facto* research design. Being a vegetable belt, 90 tomato growers were selected by proportionate random sampling method. The data were collected by pretested interview schedule. The collected data were analyzed, tabulated and interpreted. The statistical tools such as mean, standard deviation and percentage analysis were used. Knowledge includes behavior and test situations which emphasize the remembering either by recognition or recall, of ideas, materials or phenomena (*Bloom et.al, 1995*). The knowledge on tomato cultivation were categorized

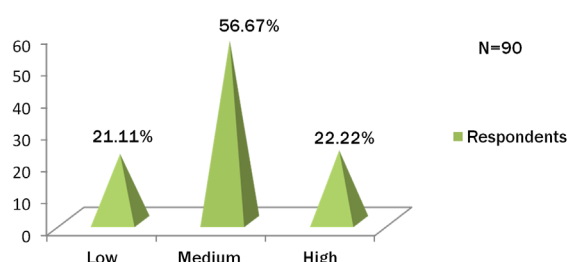
into four subheadings as crop improvement practices, crop management practices, crop protection and harvesting practices. The study on the knowledge level of the farmers on recommended cultivation practices can be beneficial to assess the technology reach about the recommended cultivation practices of tomato. In this study, knowledge symbolizes the farmers grasping of the approved tomato cultivation process. This knowledge level of the respondents on the recommended practices was evaluated using a teacher-made test constructed covering all aspects of cultivation. Around 34 questions, including all sub-questions were included in the interview schedule to test the knowledge of the respondents. The responses were dichotomous in nature as known and unknown for which a score of 2 and 1 are assigned respectively. Using percentage analysis practice-wise knowledge was studied. The formula used is as follows.

Knowledge level of  $i^{\text{th}}$  practice = (No. of respondents answered correctly / Total No. of respondents)  $\times$  100

The total knowledge score of each respondent was calculated by summing up the scores obtained by the individual respondent. Based on the scores of the respondents, their overall knowledge was assessed as low, medium and high by using cumulative frequency.

## RESULTS AND DISCUSSION

The knowledge level of the respondents on recommended tomato cultivation practices was shown in Table 1 and Figure 1. Table 1 clearly shows that half (56.67%) of the respondents had medium level of knowledge followed by high (22.22%) and low (21.11%) knowledge level on recommended tomato cultivation practices. Similar findings were in accordance with Prasad *et al.* (2018), Sangeetha *et al.* (2013) and Yadav *et al.* (2014).



**Fig 1. Distribution of respondents according to their overall knowledge level**

Overall, it can be stated that 78.89 per cent of the respondents were found distributed between medium to high level of knowledge on the recommended tomato cultivation practices. The probable reason might be that the exposure was given by the State Department of Horticulture and Agricultural College Madurai, nursery unit and

input dealers who made them aware of tomato technologies.

**Table 1. Distribution of respondents according to their overall knowledge (N=90)**

	Category	Frequency	Per cent
Low	(57.51.)	19	21.11
Medium	(57.51- 62.79)	51	56.67
High	(>62.79)	20	22.22
Total		90	100.00

Mean = 60.15

Standard deviation = 2.64

The knowledge on tomato cultivation were categorized into four subheadings as crop improvement practices, crop management practices, crop protection and harvesting practices. The practice-wise knowledge level on tomato cultivation is tabulated in Table 2.

### i. Crop Improvement Practices

Cent per cent of the respondents had correct knowledge on the practices viz ., sowing season, Farmyard manure application, selection of planting material, transplanting and spacing. The findings are in line with the findings of Sangeetha *et al.* (2013). The respondents know the importance of the above practices. Hence, they had good knowledge. The crop improvement practices like field preparation (97.88%), hybrids (96.77%), urea (85.66%), superphosphate (75.66%) and muriate of potash (MOP) (64.44%) were known to 64 to 98 per cent of the respondents. Regular exposure by state agricultural and horticultural departments, private input dealers made the respondents aware of the above practices. Major ruling hybrids are Shivam, Lakshmi, Devi and Rider. Hence majority of the respondents were aware of the practices.

With regard to Micronutrient application, little more than half of the respondents (54.44%), had medium knowledge due to lack of awareness and less importance compared to major fertilizers NPK.

The seed treatment with carbendazim was known to 52.22 per cent of the respondents. But the seed treatment with bio-fertilizers and bio-fungicides were known only to 22.22 per cent. Even though state department of horticulture is taking effort to popularize bio-fertilizers, bio-fungicides and carbendazim, most of the respondents ignore the bio-fertilizers because chemical application gives quick and visible result. Bio-fertilizers may lose their effectiveness if the soil is too hot or dry and the result of bio-fertilizers was intangible.

### ii. Crop Management Practices

It was found that cent per cent of the respondents had correct knowledge on manual weeding. Agronomic practices such as surface irrigation, its interval (98.99%), gap filling (95.60%), earthing up (92.22%) and top dressing (80.00%) were known

to 80 to 99 per cent of the respondents. The above practices were regularly undertaken in tomato cultivated study area. Hence, majority of them had

knowledge on the practices. The findings of the present study are in line with the findings of Jat *et al.* (2011). The control measures for weeds by

weedicide like Pendimethalin, Fluchloralin were known to 44.44 per cent of respondents.

**Table 2. Practice-wise knowledge level of tomato growers practices (N=90)**

S. No	Items	Knowledge	
		No	%
<b>I</b>	<b>Crop Improvement Practices</b>		
1.	Hybrids	87	96.77
2.	Season of sowing	90	100.00
	i. May-June		
	ii. Sep- Oct		
	iii. Nov -Dec		
3.	Field preparation	88	97.88
	Basal dose		
4	FYM @12.5 t ha <sup>-1</sup>	90	100.00
5	Urea (N@45-50 kg ha <sup>-1</sup> )	77	85.66
6	Superphosphate (P@ 200-250 kg ha <sup>-1</sup> )	68	75.66
7	Muriate of Potash (MOP) (K@ 90-100 kg ha <sup>-1</sup> )	58	64.44
8	Micro nutrients		
	Foliar spray of ZnSO <sub>4</sub> @ 0.5 per cent, Spray 19:19:19 + Mn @ 1 % at 60 days after planting.	49	54.44
9	Planting material	90	100.00
10	Seed treatment practices with chemicals	47	52.22
11	Seed treatment practices with bio-fertilizer	20	22.22
12	Transplanting (25 - 30 days old seedling)	90	100.00
13	Spacing (60X45 cm)	90	100.00
<b>II</b>	<b>Crop Management Practices</b>		
14	Gap filling (6 - 10 days after transplanting)	86	95.60
15	Earthing up	83	92.22
16	Manual Weeding	90	100.00
17	Weedicide application ( Pendimethalin/ Fluchloralin)	40	44.44
18	Surface Irrigation	89	98.99
19	Weekly intervals of irrigation	89	98.99
20	Top Dressing (N@100 -150kg ha <sup>-1</sup> /Foliar spray 0.3% / Boric acid)	72	80.00
<b>III</b>	<b>Plant Protection Practices</b>		
	Pests		
21	Fruit borer and control measure (Azadirachtin /Quinalphos)	67	74.44
22	Serpentine leaf miner and control measure (Neem seed kernel extract / cyantraniliprole)	61	67.78
23	Thrips and control Measure (Cyantraniliprole / Thiamethoxam)	61	67.78
24	White fly and control measure (Carbofuran) Diseases	51	56.67
25	Damping off and control measure (COC @2.5gl <sup>-1</sup> )	30	33.33
26	Leaf spot and control measure (Mancozeb)	57	63.33
27	Tomato early blight and control measure (Hexaconazole / Propiconazole)	65	72.22
28	Leaf curl and control measure (Carbofuran / Malathion)	63	70.00
29	Tomato spotted wilt (Carbofuran)	37	41.11
<b>IV</b>	<b>Physiological disorders</b>		
30	Sunscald	64	71.11
31	Fruit Cracking	67	74.44
32	Cat facing	59	65.56
<b>V</b>	<b>Harvesting Practices</b>		
33	Time of harvest	89	98.99
34	Symptom of harvest	90	100.00

### iii. Plant protection measures

Under pest management, the knowledge level of the respondents on fruit borer (74.44%), thrips and Serpentine leaf miner (67.78%) was medium to high. Only 56.67 per cent of respondents had knowledge on whitefly management.

Concerning disease management, the majority of the respondents possessed the correct knowledge on tomato early leaf blight (72.22%), leaf curl (70.00%) and leaf spot (63.33%). The respondents had low knowledge level on tomato spotted wilt (41.11 %) and damping-off (33.33%). Supporting findings of the plant protection are in conformity with the findings of Sasane *et al.* (2010).

### iv. Physiological disorders

About physiological disorders, the majority of the respondents possessed the correct knowledge on fruit cracking (74.44%), sunscald (71.11%) and cat facing (65.56%). Due to climate change, physiological disorders in vegetable crops are emerging more and more.

### v. Harvesting

Regular practice and experience enriched the responses with appropriate knowledge on symptoms (100.00%) and correct time of harvesting the tomato (98.99%). Supporting findings of the study with the findings of Jat *et al.* (2011).

## CONCLUSION

The study revealed that 56.67 per cent of the respondents had medium-level knowledge of recommended tomato cultivation practices. Majority of the respondents had cent per cent knowledge of practices like the season of sowing, farmyard manure, planting material, transplanting, spacing, manual weeding and symptom of harvest. The study showed that the respondents had low knowledge on seed treatment practices with bio-fertilizer, damping off, tomato spotted wilt and weedicide application. In order to increase the production and productivity of tomato, these practices have been concentrated by the extension officials and policy makers.

### Ethics statement

No specific permits were required for the described field studies because no human or animal subjects were involved in this research.

### Consent for publication

All the authors agreed to publish content.

### Competing interests

There was no conflict of interest in the publication of this content

### Data availability

All the data of this manuscript are included in the M.S. No separate external data source is required. If anything is required from the M.S., certainly, this will be extended by communicating with the corresponding author through corresponding official mail : sangavimuthuraj@gmail.com

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