Original Research Article

Knowledge of farmers regarding improved tomato cultivation practices in Mokokchung district of Nagaland.

Abstract:

The present study was conducted to ascertain the socio-economic profile of the respondents and determine the level of knowledge of tomato growers towards improved tomato cultivation practices. The study was conducted in the district of Mokokchung at Ongpangkong block, Nagaland. Mokokchung district comprises of 9 blocks out of which only one block, namely Ongpangkong was selected purposively on the basis of maximum area under tomato cultivation. From the selected block, six villages were selected form each village 20 farmers were selected randomly. A comprehensive structured interview schedule covering all aspects of the improved tomato cultivation practices was prepared. The items included in the interview schedule were structured questions and objective type questions which were suitable to all categories of respondents. The data was collected from them, analyzed using MS-excel to draw a logical conclusion. The study inferred that majority of the respondents possessed high school level education with land holding less than 2.5 acres, and had medium level of extension contact. The overall knowledge level of the respondents was found under medium level. The local extension officials along with scientists should take appropriate knowledge promotional strategies such as training, demonstrations, exhibitions, etc., to improve the knowledge of the respondents.

Key words: *Improved tomato cultivation practices, Nagaland, Tomato growers, Knowledge.*

Introduction:

Vegetables were grown in India since thousands of years but nowadays it had become an important commercial enterprise at both national and international level (Kumar, 2014). In recent years, the vegetables have become an essential requirement of the daily human diet, because of its nutritional value. Tomato (*Lycopersicon ecsulentum*) is one of the important and popular fruit vegetables, which had its origin in Central and South America and which belongs to the night shade family, Solanaceae. Numerous varieties of tomato are widely grown in temperate climates

across the world, with the help of greenhouses allowing its production throughout the year and in cooler areas. Tomato may be regarded as king of vegetables for its wide economic use and also is called as a "poor man's orange" because it contains more or less same nutrients which orange possesses. About tomato, doctors have the view that "A tomato a day keeps doctors away". Tomato is cultivated in 3295 hectares of land (Gowda, 2009). Tomato cultivation is location specific. It requires enough care right from sowing to post harvesting operations. Necessary package of practices must be followed for better yield. It demands complete knowledge of production and post-harvest technology. It must be adopted by farmers in right manner and at right time. (Sharma *et al*., 2015). The Naga tree tomatoes are locally known as 'Sei Bangenuo' — the name is a derivation from the Tenyidie dialect which translates to 'tree tomato'. The fruit looks a lot like tomato, but bears an egg-like shape. With over 30 species around the world, the Naga tree tomato is also called 'tamarillo'. It was given the GI number 374 between April 2014 and March 2015. Ongpangkong block under Mokokchung district provides suitable climatic condition for tomato cultivation. The condition of the soil as well was very much suitable for the cultivation of tomato and other horticultural crops (Singh *et.al.* 2021). Commercialization of tomato was already implemented, but productivity was less due to improper technical knowledge and awareness etc. Therefore, this study has been made to know the root causes that are responsible for low production due to non-adoption and delay in adoption of recommended practices in tomato cultivation. Keeping all those researchable issues in mind, the following specific objectives were formulated for the study.

- To ascertain the socio-economic profile of the respondents.
- To determine the level of knowledge of the respondents towards improved tomato cultivation practices.

Methodology:

Tomato is a major commercial vegetable crop in Mokokchung district; Hence this district had selected purposively for the study. Further at Ongpangkong block was selected from Mokokchung district. A list of tomato growing villages was prepared with the help of DHO, Mokokchung Only six villages namely Longkhum, Ungma, Mangmetong, Aliba, Chungtia, and Mokokchung were selected randomly and considered for study on the basis of larger area

coverage. A list of tomato growers of each selected village was prepared with the help of DHO, Muzaffarpur. Twenty tomato growers were taken from each selected village. Thus, a total number of 120 tomato growers were constituted as the sample for the study. Considering the objectives and the variables selected for the study, a comprehensive structured interview schedule covering all aspects of the improved tomato cultivation practices was prepared. The items included in the interview schedule were structured questions and objective type questions which were suitable to all categories of respondents. The data was collected from them, analyzed using MS-excel to draw logical finding. Appropriate quantification devices were used to quantify the variables included in the study and they were mean, percentage, frequencies, standard deviation, correlation and regression analysis.

Results and Discussion:

Table 01: Socio-Economic profile characters of the respondents

S. No.	Socio-Economic profile characters	Number	Per cent
1.	**Age**		
	Young	36	30.00
	Middle	60	50.00
	Old	24	20.00
2.	**Educational status**		
	Illiterate	08	06.66
	Functionally literate	13	10.86
	Primary school education	17	14.16
	Middle school education	20	16.66
	High school education	26	21.66
	Higher secondary education	18	15.00
	Collegiate education	18	15.00
3.	**Occupational status**		
	Agriculture alone	60	50.00
	Agriculture + Business	18	15.00
	Agriculture + Labour	30	25.00
	Agriculture+ Government / Private services	12	10.00
4.	**Marital Status**		
	Married	111	92.50
	Unmarried/Divorced/Separated	9	7.50
5.	**Size of land holding**		
	Up to 2.5 acres	63	52.50
	2.5 acres to 5 acres	41	34.17
	More than 5 acres	16	13.33
6.	**Family size**		

	Small	66	55.00
	Medium	42	35.00
	Big	12	10.00
7.	**Annual Income**		
	Very low income (Upto 1 Lakh)	08	06.67
	Low income (1 to 2 lakhs)	34	28.33
	Medium income (2 to 3 lakhs)	36	30.00
	High income (Above 3 lakhs)	42	35.00
8.	**Extension agent contact**		
	Low	36	30.00
	Medium	57	47.50
	High	27	22.50
9.	**Social participation**		
	Low	59	49.17
	Medium	40	33.33
	High	21	17.50
10.	**Training exposure**		
	Low	100	83.40
	Medium	19	15.80
	High	1	0.80
11.	**Scientific orientation**		
	Low	32	26.67
	Medium	77	64.17
	High	11	09.16
12.	**Mass Media Exposure**		
	Low	32	26.67
	Medium	37	30.83
	High	51	42.50

From table 01, majority (50.00%) of the tomato growers comes under 36-45 age category (middle), whereas a young tomato farmers contributed 30.00% in this study and one-fifth (20.00%) of the study accounted with old age tomato growers. The majority (21.66%) of the farmers were completed their high school education, followed tightly by the tomato growers who have completed middle school education (16.66%), higher secondary school education (15.00%), collegiate education (15.00%) and primary school education (14.16%), few farmers (10.86%) have not attainted the formal education but they were remained to functionally literate and less than 10.00 per cent (06.66%) of the tomato growers were remain to be illiterate. Half (50.00%) of the tomato farmers occupation was agriculture alone. One-fourth (25.00%) of the farmers were the agricultural laborers, followed by 15.00 per cent and 10.00 per cent of the famers were doing agriculture along with business and agriculture along with government/ private services respectively. Higher percentage of the tomato growers had small family (55.00%), followed by

medium (35.00%) and big family (10.00%). More than half (52.50 7%) of the farmers hold less than 2.5 acres of land, followed by 34.17 per cent of the tomato growers comes under 2.5 to 5 acres category, and 13.33 per cent of the tomato growers hold more than 5 acres of land. Annual income of the tomato growers of the study area showed that (35.00%) of the respondents had an income more than 5 lakhs. Whereas (30.00%) of respondents had an income 3 to 5 lakhs followed by 28.33 per cent of the respondents had an annual income between 1 to 3 lakhs. A very less percentage of respondents (06.67%) had income below 1 lakh. Higher percentage of the tomato growers had low level of social participation (49.17%), followed by medium (33.33%) and high (17.50%) level of social participation respectively. Majority of the tomato growers (83.40%) had attended less number of trainings followed by 15.80 per cent of the tomato growers had participated medium level of trainings and remaining 0.80 per cent of the tomato growers had high level of trainings participated. Majority of the tomato growers had medium (47.50%) level of extension contact, whereas the 30.00 per cent of the tomato growers had low level of extension contact and nearly one-fourth (22.50%) of the tomato growers had high level of extension contact. Majority (64.17%) of the tomato farmers had medium level of scientific orientation, followed by 26.67 per cent and 09.16 per cent of the tomato farmers had low and high level of scientific orientations respectively. Majority (42.50%) of the farmers had high level of mass media exposure followed by 30.80 per cent of the tomato farmers had medium level of mass media exposure. About, 24.44 per cent of the tomato growers developed low level of mass media exposure.

Table 02: Knowledge level of the Farmers

Table 2.1 . Distribution of tomato growers according to their statement wise knowledge.

Sl. No.	Recommended cultivation Practices	Fully Known		Partial Known		Not Known	
		F	%	F	%		
1.	Varieties recommended	49	40.83	71	59.17		
2.	Sowing time	79	65.83	41	34.17		
3.	Seed treatment	90	75.00	30	25.00		

4.	Seed rate	77	64.17	43	35.83		
5.	Field preparation	74	61.67	46	38.33		
6.	Method of sowing	75	62.50	45	37.5		
7.	Spacing	59	49.17	61	50.83		
8.	Manures & fertilizers	53	44.17	67	55.83		
9.	Methods of irrigation	69	57.50	51	42.50		
10.	Weed management	55	45.83	65	54.17		
11.	Disease identification	112	93.33	08	6.67		
12.	Disease control	89	74.17	31	25.83		
13.	Pest control	86	71.67	34	28.33		
14.	Harvesting	101	84.17	19	15.83		
15.	Yield	95	79.17	25	20.83		

From the table , it was evident that higher percentage of the farmers had knowledge on varieties (40.83%), majority (65.83%) of growers possessed correct knowledge on sowing time. Majority of the respondents had correct knowledge about the practices of seed treatment (75.00%). More than half (64.17%) of tomato growers had correct knowledge about seed rate. About 61.67 and 62.50 per cent of respondents had knowledge about field preparation and method of sowing. Whereas, 49.17 and 44.17 per cent of respondents had knowledge about spacing and manures and fertilizers. From the results it could be observed that majority (93.33%) of respondents had knowledge on disease identification. The reason might be that diseases identification was an important practice which was specially performed in tomato cultivation. Majority of tomato growers had correct knowledge on weed management (45.83%), disease control (74.17%), pest control (71.67%), harvesting (84.17%) and yield (79.17%).

Table 2.2. Distribution of respondents according to their Knowledge level

S. No.	Category (Score)	Knowledge	
		Frequency	Percentage

1.	Low	33	23.33
2.	Medium	59	49.17
3.	High	28	27.50
4.	Total	120	100.00

From above table , it could be understood that higher percentage (49.17%) of the tomato growers possessed medium level of knowledge followed by high (27.50%) and low (23.33%) level of knowledge about recommended cultivation practices in tomato. The finding of the study was parallel to the finding of Upma *et.al.* (2012), Yadav *et.al* (2018) and Yogendra *et.al.* (2021).

Table.03. Association between the independent variables and knowledge level of the farmers about improved tomato cultivation practices

S. No.	Characteristics	'r' value
X1	Age	-0.122
X2	Education	0.406**
X3	Occupation	0.177
X4	Marital status	0.156
X5	Family size	0.094
X6	Size of the total land holding under tomato cultivation	0.289*
X7	Annual income	0.204*
X8	Social participation	0.031
X9	Trainings exposure	0.361*
X10	Extension contact	0.367*
X11	Scientific orientation	0.140
X_{12}	Mass media exposure	0.356*

NS = Not Significant; * = Significant at 5%, ** = Significant at 1%.

It could be understood from the table.17, that age, occupation, marital status, family size, social participation, and scientific orientation, had non-significant association with the knowledge level of the farmers about improved tomato production technology. Meanwhile, size of the total land holding under tomato cultivation, annual income, trainings exposure, extension contact and mass media exposure had positive and significant association with the knowledge level of the farmers about improved tomato cultivation practices at 5 per cent level of probability. In addition to this educational status had positive and significant association with the knowledge level of the farmers about improved tomato cultivation practices at 1 per cent level of probability.

Conclusion:

Majority of the respondents possessed high school level education with land holding less than 2.5 acres and had medium level of extension agent contact. The present study reported that nearly half of the farmers belong to medium knowledge category respectively. So, there is a scope for the extension system to educate the farmers about the improved package of practices to get higher yield and profits by designing an appropriate extension strategies like training, demonstrations, exhibitions, field days, field visits etc. Majority of tomato growers partially adopted the critical practices such as, FYM, chemical fertilizers and plant protection measures. Hence Suitable assistance from extension agencies is essentially required in motivating the growers to realize the importance of these critical practices to improve the production of tomato. In the tribal regions, community radio system may be helpful to provide the useful and necessary information for tomato cultivation in their local language.

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