



## Research Article

# KNOWLEDGE OF THE FARMERS ABOUT IMPROVED TOMATO (*Solanum lycopersicum* L.) PRODUCTION TECHNOLOGY IN JAISAMAND COMMAND AREA OF RAJASTHAN

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**Abstract-** Tomato is most significant protective food because of its specific nutritional value. It is most versatile vegetable with vast usage in Indian culinary tradition. Tomato is mostly for soup, salad, pickles, ketchup, puree, sauces and salad vegetable. Udaipur district of Rajasthan was selected for present investigation. There are total eleven tehsils in Udaipur district, out of which Sarada tehsil was selected on the basis of maximum area under tomato cultivation. Six villages from identified tehsil were selected on the basis of maximum area under tomato cultivation. For selection of respondents, 120 tomato growers (60 tribal and 60 non-tribal farmers) were randomly selected from identified villages (20 from each village) for data collection. The study revealed that, majority of respondents 55.00 per cent fell in medium level knowledge group whereas, 23.33 per cent tomato growers were observed in the low knowledge level group and remaining 21.67 per cent respondents possessed high level of knowledge about improved tomato production technology. The findings of the study indicated that majority of tomato growers had adequate knowledge regarding method of sowing followed by harvesting and storage techniques, whereas they had less knowledge regarding plant protection measures, seed rate and spacing.

**Keywords-** Vegetable, Tomato, Knowledge, Production and Technology.

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## Introduction

Tomato is used for soup, salad, pickles, ketchup, puree, sauces and in many other ways it is also used as a salad vegetable. Vegetables play an important role in human health and nutrition. About 300 gm of vegetables are needed (90 gm root vegetables, 120 gm green vegetables and 90 gm other vegetables) per day per capita for maintenance of human health. They are commonly used for treating diabetes, in reducing harmful blood cholesterol, preventing coronary thrombosis, heart attack and stroke. Tomato in India has become almost an essential food of both higher and lower class people. Tomato is higher source of vitamins A, B and C [1].

The area under tomato crop was 17.15 thousand hectares and production was 81.75 thousand metric tonnes in Rajasthan. The total production of tomato in Udaipur district in the year 2013-14 was about 290 tonnes and area was 136 hectares. The climatic conditions of the Udaipur district are most suitable for cultivation of tomato but the productivity of this crop is below than the desired level. Keeping these facts in view, the present study entitled "Adoption of Improved Tomato (*Solanum lycopersicum* L.) Production Technology by the Farmers in Jaisamand Command Area of Rajasthan" was undertaken [2].

## Materials and Methods

The present investigation was conducted in Udaipur district of Rajasthan because of the selected district has the highest area in southern Rajasthan and great potential of increasing production and productivity under tomato crop. The selected district consists of eleven tehsils, out of which one tehsil, namely Sarada with maximum area under tomato crop were selected for the study purpose. Six villages from tehsil were identified on the basis of maximum area under tomato

crop. All six villages were chosen for present study. A extensive list of tomato farmers made with the help of village patwari and agriculture supervisor of respective village, out of list 20 farmers were selected from each village on the basis of random sampling technique. Thus, total 120 farmers (60 tribal and 60 non-tribal farmers) were selected for present investigation. Data were collected by personnel interview technique through suitable structured schedule. After that, data were tabulated analyzed and interrupted were drawn in light of objective [3-5].

## Statistics

In order to answer the research questions mentioned under hypothesis and to achieve the object of the study, investigator undertook appropriate and most pertinent statistical analysis. The following statistical methods were used in the present study:

### Percentage and frequency

The percentage and frequency of each studied item was calculated and simple comparisons were made.

### Mean per cent score (MPS)

It was calculated by multiplying total obtained score of the respondents by 100 and divided by the maximum obtainable score.

$$\text{Mean per cent score} = \frac{\text{Total score obtained}}{\text{Maximum obtainable score}} \times 100$$

**Rank**

Ranks were accorded in the descending order according to the mean per cent score obtained. This was used to find out the knowledge in order of priority.

**Standard Deviation**

The standard deviation (S.D.) measures the absolute dispersion of variability of distribution. The standard deviation was used in categorization of respondents in different groups.

$$SD = \sqrt{\frac{\sum X_i^2}{n} - \left(\frac{\sum X}{n}\right)^2}$$

Where,

- $\sum X_i^2$  = sum of squares of the observation
- $\sum X_i$  = sum of values of the observation
- $n$  = Number of respondents

**V 'Z' test (Standard Normal Deviate test):**

This test was used to observe significance of difference between two sample mean for large sample (i.e. n>30). Formula for 'Z' test is as under

$$Z = \frac{|\bar{X}_1 - \bar{X}_2|}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Where,

- $X_1$  = Mean of first sample
- $X_2$  = Mean of second sample
- $S_1$  = Standard deviation of first sample
- $S_2$  = Standard deviation of second sample
- $n_1$  = Size of first sample
- $n_2$  = Size of the second sample

**Results and Discussion**

**Knowledge of the farmers about improved tomato production technology**

This part of chapter deals with the existing status of knowledge of farmers about improved tomato production technology. Knowledge, as a body of information possessed by individual, is one of the important components of behavioral aspects and play important role in adoption of innovation. On this ground, it is imperative to know the extent of knowledge of farmers about tomato cultivation. Hence, keeping in view, efforts have been made in this section to report the existing knowledge of tomato growing respondents towards different aspects of tomato cultivation. The results have been presented under following heads:

**Distribution of respondents according to their knowledge about improved tomato production technology:**

Distribution of respondents according of their existing knowledge level about tomato production technology, low, medium and high level of knowledge three categories were made by using mean score and SD of the obtained knowledge score by the respondents.

[Table-1] reveals that out of 120 respondents, majority of respondents 55.00 per cent fell in medium level knowledge group whereas, 23.33 per cent tomato growers were observed in the low knowledge level group and remaining 21.67 per cent respondents possessed high level of knowledge about improved tomato production technology.

[Table-1] revealed that out of 120 respondents, majority of respondents 55.00 per cent fell in medium level knowledge group whereas, 23.33 per cent tomato growers were observed in the low knowledge level group and remaining 21.67 per cent respondents possessed high level of knowledge about improved tomato production technology.

Analysis of [Table-1] further reveals that 35.00 and 11.66 per cent respondents were observed in low knowledge level group in tribal and non-tribal farmers respectively. While, 51.66 and 58.33 percent respondents were observed in medium knowledge level group intribal and non-tribal farmers respectively.

Whereas, 13.33 and 30.00 per cent respondents were observed in high knowledge level group in tribal and non-tribal respectively.

**Table-1** Distribution of respondents according to their knowledge level about improved tomato production technology: n=120

S.No.	Knowledge Level	Tribal farmers		Non-tribal farmers		Total	
		f	%	F	%	f	%
1.	Low (<37.97)	21	35.00	7	11.67	28	23.33
2.	Medium (37.97 to 75.19)	31	51.66	35	58.33	66	55.00
3.	High (>75.19)	8	13.34	18	30.00	26	21.67
	Total	60	100	60	100	120	100

f = frequency, % = per cent

The present findings are in accordance with the findings of Jat *et al.* (2011) found that more than half of his respondents were having medium knowledge level about tomato production technology and 25.39 per cent farmers were having high knowledge level, whereas 16.92 per cent of farmers were having low knowledge level about tomato production technology. [6]

**Aspect-wise knowledge of the respondents regarding improved tomato production technology:**

To get a clear picture of knowledge possessed by tomato growers, aspect-wise knowledge of tomato growers was works out. For this mean per cent scores for each practice was calculated and ranks were accorded. Knowledge of the respondents was assessed under ten major aspects of improved tomato production technology: The results of the same have been presented in [Table-1].

**Table-2** Knowledge of the respondents regarding improved tomato production technology: n = 120

S. NO.	Aspect	Tribal farmers		Non-tribal farmers		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Improved varieties	32.00	XII	54.50	VIII	42.12	X
2	Soil and field preparation	57.70	V	66.87	IV	59.89	V
3	Seed and soil treatment	36.42	XI	43.57	XI	38.92	XI
4	Nursery management	64.44	III	74.44	II	68.05	III
5	Transplanting of seedling	60.83	IV	64.16	V	61.66	IV
6	Method of sowing	71.66	I	93.33	I	81.66	I
7	Seed rate and spacing	49.58	VII	30.00	XIII	38.75	XII
8	Fertilizers application	42.16	X	53.5	IX	46.41	VIII
9	Irrigation management	47.77	VII	56.66	VI	47.50	VII
10	Weed management	43.33	IX	43.33	XII	46.01	IX
11	Plant protection measures	27.08	XII	45.00	X	35.46	XIII
12	Harvesting and storage techniques	70.83	II	70.83	III	69.44	II
13	Processing and marketing	52.40	VI	55.37	VII	53.33	VI

MPS = Mean per cent score

The data incorporated in [Table-2] indicates that tribal farmers possessed 32 per cent extent of knowledge about improved varieties aspect whereas; knowledge of non-tribal farmers about this practice was comparatively higher with 54.50 per cent. Further, analysis shows that this practice was ranked twelfth by tribal farmers, whereas, eight by non-tribal farmers. The knowledge about soil and field preparation, it was noted that tribal and non-tribal farmers had knowledge 57.70

and 66.87 per cent respectively. Further, analysis shows that this practice was ranked fifth by tribal farmers, whereas, fourth by non-tribal farmers.

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The extent of knowledge, about high seed and soil treatment of tomato, the tribal and non-tribal farmers possessed 36.42 and 43.57 per cent respectively. This practice was ranked eleventh by tribal farmers and as well as by non-tribal farmers. It was found that 64.44 and 74.44 per cent knowledge about nursery management was recorded in tribal and non-tribal farmers respectively. This practice was ranked third by tribal farmers and second by non-tribal farmers. This practice was ranked third by tribal farmers and second by non-tribal farmers.

Regarding knowledge about transplanting of seedling, it was noted that tribal and non-tribal farmers had 60.83 and 64.16 per cent extent of knowledge respectively. The above practice was revealed fourth by tribal and fifth by non-tribal respondents. In case of method of sowing, tribal and non-tribal farmers had 71.66 and 93.33 per cent knowledge and ranked first by both tribal and non-tribal farmers. Table clearly shows that both the categories of pigeon-pea growers were aware of both the aspects of management. The knowledge about seed rate and spacing was placed at seventh rank by tribal farmers (49.58 %), whereas, non-tribal farmers possessed (30.00 %) knowledge about this aspect at thirteenth rank in order of practices with respect to the extent of knowledge about tomato cultivation technology. The extent of knowledge about fertilizers management, it was noted that tribal and non-tribal farmers had knowledge 42.16 and 53.50 per cent respectively. This practice was ranked tenth by tribal farmers and ninth by non-tribal farmers.

The extent of knowledge about irrigation management, it was noted that tribal and non-tribal farmers had knowledge 47.77 and 56.66 per cent respectively. This aspect was ranked eighth by tribal farmers and sixth rank by non-tribal farmers.

The extent of knowledge, about weed management of tomato, the tribal and non-tribal farmers possessed 43.37 and 43.37 per cent respectively. This practice was ranked ninth by tribal farmers and twelfth by non-tribal farmers. Whereas, the knowledge regarding plant protection measures it was found that tribal and non-tribal farmers possessed 27.08 per cent and 45.00 per cent knowledge respectively. This aspect was ranked thirteenth by tribal farmers and tenth rank by non-tribal farmers. It means the non-tribal farmers have medium knowledge but the tribal farmers lack of knowledge about this practice.

The knowledge about harvesting and storage techniques, it was found that 70.83 and 70.83 per cent was recorded in tribal and non-tribal farmers respectively. The knowledge about this aspect at second and third ranked by the tribal and non-tribal farmers respectively. At last the knowledge about processing and marketing, it was found that 52.40 and 55.37 per cent was recorded in tribal and non-tribal farmers respectively. The knowledge about this aspect at sixth and seventh ranked by the tribal and non-tribal farmers respectively.

Analysis of table further revealed that majority of farmers has high knowledge about method of sowing with MPS 81.66 and ranked first. The extent of knowledge about harvesting & storage techniques and nursery management ranked second and third with MPS 69.44 and 68.05 respectively. The extent of low knowledge regarding seed & soil treatment, seed rate & spacing and plant protection measures was 38.92, 38.75 and 35.46MPS and ranked eleventh twelfth and thirteenth respectively by the tomato growers.

#### Comparison of knowledge between tribal and non-tribal farmers about improved tomato production technology:

In relation to the extent of knowledge of respondents about improved tomato cultivation technology, it also felt necessary to study the difference between tribal and non-tribal farmers. To find out the variation in the knowledge of the respondents 'z' test was applied. The result are presented in Table.

**NH<sub>01</sub>:** There is no significant difference between tribal and non-tribal farmers with respect to knowledge about improved tomato production technology.

**RH<sub>01</sub>:** There is significant difference between tribal and non-tribal farmers with respect to knowledge about improved tomato production technology.

**Table-3** Comparison of knowledge between tribal and non-tribal farmers about improved tomato production technology

S. No	Category of sample	Mean	S.D.	'Z' value
1.	Tribal farmers	49.48	17.43	4.52**
2.	Non-tribal farmers	63.68	17.08	

\*\*Significant at 1 per cent level of significance

[Table-3] shows that the calculated value of 'Z' (4.52) is greater than its tabulated value at 1 per cent level of significance. Thus, null hypothesis (NH<sub>01</sub>) is rejected and research hypothesis entitled "there is significant difference between the tribal and non-tribal farmers with respect to knowledge about improved tomato production technology." was accepted. It infers that there was significant difference between tribal and non-tribal farmers with respect to possession of knowledge about improved tomato production technology. Further analysis of table shows that knowledge of non-tribal farmers more than the tribal farmers.

#### Conclusion

The study revealed that, majority of respondents 55.00 per cent fell in medium level knowledge group whereas, 23.33 per cent tomato growers were observed in the low knowledge level group and remaining 21.67 per cent respondents possessed high level of knowledge about improved tomato production technology. The findings of the study indicated that majority of tomato growers had adequate knowledge regarding method of sowing followed by harvesting and storage techniques, whereas they had less knowledge regarding plant protection measures, seed rate and spacing. Findings indicated that there was significant difference in knowledge between the tribal and non-tribal farmers about improved tomato production technology.

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**Author Contributions:** None declared

#### Abbreviations:

%	-	Per cent
et al.	-	et alibi (& elsewhere)
f	-	Frequency
MPS	-	Mean Per cent Score
n	-	Number of respondents
RCA	-	Rajasthan College of Agriculture
SD	-	Standard deviation

**Conflict of Interest:** None declared

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