

## Knowledge Level of Chickpea Growers about Chickpea Production Technology

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### ABSTRACT

*Chickpea, as an important pulse crop, is an integral part of subsistence and sustainable production systems of Madhya Pradesh. Therefore, a study was undertaken to assess the knowledge level of chickpea growers regarding chickpea production technology in Indore district of Madhya Pradesh. A total of 120 chickpea growers were selected as respondents for this study. A 'knowledge index' consisting of 10 dimensions was prepared to measure the knowledge level of chickpea growers. The study revealed that the chickpea growers had poor knowledge about soil treatment, high yielding varieties and bio-fertilizer, while majority of them had knowledge about critical stage of irrigation. The majority of the respondents had awareness regarding recommended doses of manures and fertilizer, bio-fertilizer, seed rate, improved varieties, spacing and method of sowing. The socio-economic, communication and psychological factors had significant positive relationship with knowledge level of chickpea growers except age, land holding, and farm mechanization. Cosmopolitaness, attitude towards chickpea production technology, scientific orientation, extension participation, economic motivation, mass media exposure and information source utilization were the important factors which had direct and indirect effect on knowledge of chickpea growers.*

**Key words :** Chickpea; Sustainable production;

India is the largest producer, importer and consumer of pulses in the world, accounting for 25 % of global production, 15 % trade and 27 % consumption. In India more than a dozen of pulse crops including chickpea (40%) pigeonpea (18%), urdbean (11%), mungbean (9%), lentil (8%), field pea (5%) and others are grown on 22 - 24 million hectares producing 13 - 15 million tones of grain with an average productivity of 600 - 650 kg/ha. As compared to cereals, most of the pulses still wait for significant breakthrough in terms of production and productivity. This group of crops is capable of restoring soil fertility and therefore, remains an integral part of subsistence and sustainable production systems. Among pulses, chickpea is the most important pulse crop in the country grown in more than 6.93 million hectares area which contributes 62 per cent of the global production (5.6 million tonnes) and about 37 per cent of total pulse production in the country.

Chickpea is an important pulse crop of Madhya Pradesh grown in 2.86 million hectares of land annually producing 2.66 million tones. It is also one of the important pulse crop of Indore district of Madhya Pradesh grown in 0.41 lakh hectares of land annually producing 0.27 lakh tones with the average productivity of 6.56 q/ha. Knowledge has been found to be an

important factor contributing to adoption of recommended technology by the farmers. Keeping this in view, a study was undertaken to assess the knowledge level of chickpea growers regarding chickpea production technology.

### METHODOLOGY

The study was conducted in Indore district of Madhya Pradesh. Two blocks viz. Depalpur and Sanwer and five villages from each block were selected randomly. From each selected village, twelve chickpea growers were selected randomly. Thus, a total of 120 chickpea growers were selected as respondents for this study. The data were collected with the help of a pre-tested interview schedule through personal interview.

To measure the knowledge level of chickpea growers, a 'knowledge index' was prepared taking the 10 dimensions namely; knowledge of high yielding varieties, soil treatment, seed rate per acre for different varieties, seed treatment, bio-fertilizer and its applications, method of seed sowing, recommended spacing, critical stage of irrigation, manure and fertilizer and insect-pest disease and control. These dimensions were identified after thorough review of literature and discussions held with scientists and other experts in

the field. For each of the knowledge dimensions, except method of sowing, a maximum score of 2 was given for the farmer who had complete knowledge of the recommended practice pertaining to those dimensions. A score of 1 was assigned when the farmer expressed awareness but did not know the details and a score of zero was assigned when the farmer expressed total ignorance. For the dimension 'method of sowing' the scores ranged from 1 to 3. One for knowledge confined to broadcasting method and 2 for sowing behind the plough and 3 for knowledge about sowing with seed drill. Thus, the total knowledge score could range from 1 to 23. The total score of knowledge for each respondent was computed by adding up the scores of eleven dimensions.

The knowledge level categories were formulated as low, medium and high on the basis of mean  $\pm$  SD. The correlation analysis was carried out to find out the relationship between socio-economic, communication and psychological variables with knowledge. To explain the contribution of selected factors on adoption, step-wise multiple regression analysis was carried out.

## RESULTS AND DISCUSSION

*Practice-wise knowledge of the respondents about chickpea production technology* : Knowledge of the chickpea growers about chickpea cultivation practices was analysed for ten practices of improved chickpea production technology namely, high yielding varieties, soil treatment, seed rate, seed treatment, bio-fertilizers, method of seed sowing, recommended spacing, critical stage of irrigation, manure and fertilizer and insect, pest and diseases (Table 1). The data reveal that majority of chickpea growers (70%) had complete knowledge about critical stage of irrigation followed by recommended method of sowing (38.33%), recommended spacing (30%), seed treatment (10%) and insect pest and disease (10%). However, very few respondents had complete knowledge about high yielding varieties (4.16%), seed rate (6.66%), bio-fertilizer (2.5%) and manure and fertilizer (3.33%). An overwhelming majority (96.66%) of the respondents had awareness about recommended doses of manure and fertilizers, followed by bio-fertilizer (94.16%), seed rate (93.33%), high yielding varieties (92.5%), seed treatment (90%), insect pest and diseases (90.0%), recommended spacing (70%), method of sowing (61.66%), soil treatment (53.33%) and critical stage of irrigation (30%). It is also apparent from the data that 46.66% respondents had no knowledge about soil treatment. Similar findings were also reported by Singh et al. (2002). Knowledge

about soil treatment, high yielding varieties and bio-fertilizer was poor amongst chickpea growers.

Table 1. Practice-wise knowledge of the respondents about chickpea production technology

S. N.	Practice	No. Knowledge	Awareness	Complete knowledge
1	High yielding varieties	4 (3.33)	111(92.5)	05 (4.16)
2	Soil treatment	56 (46.66)	64 (53.33)	0 (0)
3	Seed rate	0 (0)	112 (93.33)	08 (6.66)
4	Seed treatment	0 (0)	108 (90)	12 (10)
5	Bio-fertilizers	4 (3.33)	113 (94.16)	03 (2.5)
6	Method of seed sowing	0 (0)	74 (61.66)	46 (38.33)
7	Recommended spacing	0 (0)	84 (70)	36 (30)
8	Critical stage of irrigation	0 (0)	36 (30)	84 (70)
9	Manure and fertilizer	0 (0)	116 (96.66)	04 (3.33)
10	Insect, pest and diseases	0 (0)	108 (90)	12 (10)

Figures in parenthesis are percentage of the total

Table 2. Knowledge level of chickpea growers about chickpea production technology

Categories	Frequency	Per cent	Mean	S.D.
Low (<11 score)	02	1.67	12.87	1.61
Medium (11-14 score)	96	80.00		
High (>14 score)	22	18.33		

*Distribution of respondents according to their knowledge level* : The respondents were categorized into three groups low (score<11), medium (11-14) and high (>14) level of knowledge (Table 2). The data reveal that large majority (80%) of the respondents possessed medium level of knowledge about chickpea production technology while, about 18 % possessed high level of knowledge.

*Correlation of knowledge about chickpea production technology* : The total scores of knowledge about improved chickpea production technology for each respondent were put to correlation analysis with socio-economic, communication and psychological attributes of the respondents. Among the 13 variables studied (Table 3), ten variables viz., education, social participation, total annual income, information source utilization, extension participation, mass media exposure, cosmopolitaness, economic motivation, attitude towards chickpea production technology and scientific orientation were positively and significantly related with knowledge about chickpea production technology (significant at 0.01 level of probability). Similar findings were also reported by Singh et al. (2002) in case of mass media exposure and extension participation and by Singh et al. (2003) in case of education and mass media exposure.

The path analysis indicated that the cosmopolitaness had maximum direct effect (0.431) on knowledge followed by attitude towards chickpea production technology (0.235), information source

Table 3. Correlation and path analysis of socio-economic, communication and psychological factors with knowledge level of chickpea growers

S. No.	Factor	Correlation Coefficient 'r'	Direct Effect	Total Indirect Effect of other factors	Maximum Indirect Effect through
1	X <sub>1</sub> Age	0.084	-0.021	0.105	X <sub>10</sub> Cosmopoliteness
2	X <sub>2</sub> Education	0.757**	0.005	0.752	X <sub>10</sub> Cosmopoliteness
3	X <sub>3</sub> Operational land holding	0.065	0.033	0.032	X <sub>12</sub> Attitude towards chickpea production technology.
4	X <sub>4</sub> Social participation	0.284**	0.072	0.212	X <sub>10</sub> Cosmopoliteness
5	X <sub>5</sub> Total annual income	0.211**	0.015	0.196	X <sub>10</sub> Cosmopoliteness
6	X <sub>6</sub> Farm mechanization	0.161	-0.058	0.219	X <sub>10</sub> Cosmopoliteness
7	X <sub>7</sub> Information source utilization	0.892**	0.224	0.668	X <sub>10</sub> Cosmopoliteness
8	X <sub>8</sub> Extension participation	0.433**	0.015	0.418	X <sub>10</sub> Cosmopoliteness
9	X <sub>9</sub> Mass media exposure	0.431**	-0.023	0.454	X <sub>10</sub> Cosmopoliteness
10	X <sub>10</sub> Cosmopoliteness	0.936**	0.413	0.523	X <sub>7</sub> Information source utilization
11	X <sub>11</sub> Economic motivation	0.382**	-0.045	0.427	X <sub>10</sub> Cosmopoliteness
12	X <sub>12</sub> Attitude towards chickpea	0.907**	0.235	0.672	X <sub>10</sub> Cosmopoliteness production technology.
13	X <sub>13</sub> Scientific orientation	0.825**	0.175	0.650	X <sub>10</sub> Cosmopoliteness

\*\* Significant at 1 % level of probability

utilization (0.224) and scientific orientation (0.175), while other factors had minor effect. The data also indicated that education exerted maximum total indirect effect (0.752) on knowledge through other factors, followed by attitude towards chickpea production technology (0.672), information source utilization (0.668), scientific orientation (0.65), cosmopoliteness (0.523), mass media exposure (0.454), economic motivation (0.427) and extension participation (0.418). Out of thirteen factors, eleven factors had maximum indirect effect through cosmopoliteness. Thus, it can be concluded that cosmopoliteness, attitude towards chickpea production technology, scientific orientation, extension participation, economic motivation, mass media exposure and information source utilization were the important factors which had direct and indirect effect on knowledge of chickpea growers.

The multiple regression analysis was performed to find out the effect and extent of influence of all the variables towards the extent of knowledge about chickpea production technology. The results of analysis involving all the fourteen variables are presented in Table 4. It could be concluded from the equation that, out of thirteen variables taken for regression analysis, only five variables viz., social participation, information source utilization, cosmopoliteness, attitude towards chickpea production technology and scientific orientation were found to have significant contribution to the knowledge about chickpea production technology. The data further revealed that out of these five variables, the percent contribution of cosmopoliteness was highest

(41%) followed by attitude towards chickpea production technology (22.59%), information source utilization (21.22%), scientific orientation (15.32%) and social participation (2.17%). The data also reveals that all the predictor variables taken together explained the variation in the level of knowledge about chickpea production technology to the extent of 94.13 % cent (R<sup>2</sup>=0.9413).

Table 4. Regression analysis of selected characteristics of chickpea growers with their knowledge about chickpea production technology

S. No.	Factors	Percentile contribution	Regression coefficient "b"
<i>Socio- economic factors</i>			
1	Age	-0.195	-0.005
2	Education	0.455	0.011
3	Operational land holding	0.232	0.166
4	Social participation	2.175	0.092*
5	Total annual income	0.327	0.000
6	Farm mechanization	-0.938	-0.002
<i>Communication factors</i>			
1	Information source utilization	21.221	0.145**
2	Extension participation	0.708	0.003
3	Mass media exposure	-1.067	-0.040
4	Cosmopoliteness	41.038	0.417**
<i>Psychological factors</i>			
1	Economic motivation	-1.832	-0.54
2	Attitude towards chickpea production technology.	22.597	0.147**
3	Scientific orientation	15.324	0.147***

Significant at 5% level of probability

\*\* Significant at 1 % level of probability

Table 5 Step-down regression analysis of main characteristics of chickpea growers with their knowledge about chickpea production technology

S. No.	Factors	Percentile contribution "b"	Regression coefficient
1	Information source utilization	20.46	0.138 **
2	Cosmopolitaness	39.48	0.398 **
3	Attitude towards chickpea production technology.	24.12	0.156**
4	Scientific orientation	15.93	0.152 **

$R^2 = 0.9347$ , Multiple-R = 0.9668\*\*

f-value = 411.66 with 13 and 106 DFS

\*\* Significant at 1 % level of probability

Step-down regression analysis was also carried out to find out the contribution of selected variables towards the extent of knowledge about chickpea production technology. The variables viz., information source utilization, cosmopolitaness, attitude towards chickpea production technology and scientific orientation were included in the final set of multiple regression equation. The results of analysis involving these four variables are presented in Table 5 which reveal that all the four variables taken together explained 93.47% variation ( $R^2 = 0.9347$ ) in knowledge of chickpea production technology.

## CONCLUSION

The study revealed that the chickpea growers had poor knowledge about soil-treatment, high yielding

varieties, and bio-fertilizer, while majority of them had knowledge about critical stage of irrigation. The study also revealed that majority of the respondents had awareness regarding recommended doses of manures and fertilizer, bio-fertilizer, seed rate, improved varieties, spacing and method of sowing. Correlation analysis indicated that all the socio-economic, communication and psychological factors had significant positive relationship with knowledge level of chickpea growers except age, land holding, and farm mechanization. The study pointed out that cosmopolitaness, attitude towards chickpea production technology, scientific orientation, extension participation; economic motivation, mass media exposure and information source utilization were the important factors which had direct and indirect effect on knowledge of chickpea growers. The study also pointed out that four variables viz; information source utilization, cosmopolitaness, attitude towards chickpea production technology and scientific orientation have high predictive value as these account for 93% of total variation in the knowledge level of chickpea growers regarding chickpea production technology. Thus, it may be recommended that the variables viz., information source utilization, cosmopolitaness, attitude towards chickpea production technology and scientific orientation need to be improved amongst the chickpea growers of the study area to enhance their knowledge level regarding chickpea production technology

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