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Farmers' attitude towards rapeseed-mustard (*Brassica campestris*) cultivation in Jammu

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ABSTRACT

The present study was conducted in four sub-tropical blocks of Jammu and Samba and four temperate blocks of Doda and Reasi districts of Jammu division of Jammu and Kashmir during 2016–17. Total of 280 farmers were interviewed for assessing their attitude towards cultivation of rapeseed-mustard (*Brassica campestris*) crop through a well standardized attitude scale based on Likert technique. The attitude scale consisted of 16 items. Each item was analyzed and explained clearly to draw meaningful inferences. Results showed that 52% of the total sampled farmers had more favourable attitude and 48% had less favourable attitude towards cultivation of rapeseed mustard crop, respectively. The results obtained from t-test show that there is significant difference between attitude score of the farmers of sub-tropical and temperate zone, and output of multiple linear regression model shows that age, level of education, and knowledge level about different production recommendations significantly affected the attitude of respondent farmers towards cultivation of rapeseed mustard crop with a R^2 value of 0.153.

Key words: Farmers' attitude, Item wise analysis, Likert technique, Rapeseed mustard

Attitude has always been a subject of interest to many researchers as well as psychologist. Attitude affects the way people perceive and act towards others, objects or events that they encounter, besides that, attitudes also have an effect on one's social interactions. Conceptually attitude is 'the degree of positive or negative affect associated with some psychological object' (Thurstone 1928). Attitude is important component of behavior as it plays significant role in forming the overt and covert behavior of a person which determines the success or failure of any endeavor. The oilseed sector has been an important area of concern and interventions for the Indian policymakers during the post-reforms period when India became one of the largest importers of edible oils in the world, importing about half of domestic requirement in the 1990s (Sharma 2014). Of the total area and production under oilseeds crops in India, rapeseed-mustard (*Brassica campestris*) accounts for 22.2% of the acreage and 22.6% of the production. (DRMR 2015) with 28th productivity wise global ranking (Bhardwaj 2013). In view of the current contribution of rapeseed-mustard (20–25%) to the oilseed production in India, about 16.4–20.5 mt rapeseed-mustard needs to be produced from the present level of 7 mt to make country self-sufficient in edible oil (DRMR 2011). Rapeseed mustard crop is an important oilseed crop of the country but its average productivity in Jammu and Kashmir is far less than national average productivity. Lack of adoption of production and protection recommendations is the main reason for low productivity of rapeseed mustard in sub-tropics of J&K as compared to national productivity (Slathia *et al.* 2016). Achieving higher productivity depends upon adoption of recommended technologies and on the other hand adoption of technologies largely depends upon individual attitude towards that particular technology. The study focusses on identification of the attitude towards rapeseed mustard crop and its determinants.

MATERIALS AND METHODS

Non-experimental diagnostic research design was employed for the study. The present study was conducted in four sub-tropical blocks of Jammu and Samba and four temperate blocks of Doda and Reasi districts of Jammu and Kashmir. Twenty five mustard growers and 10 non-growers from each block were selected randomly, making a total sample size of 280 farmers for assessing their attitude towards cultivation of rapeseed mustard crop. To know the attitude of the farmers towards rapeseed mustard cultivation, attitude scales constructed by different researchers in other crops and allied fields were reviewed in the light of methodologies adopted for their construction and assessing

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the attitude level of farmers towards different psychological objects. An attitude scale was constructed by the method of Likert summated ratings suggested by Edwards (1969) for rapeseed and mustard crop. All possible items which discriminated the positive and negative attitudes of the farmers towards rapeseed mustard cultivation were collected and included in the scale. In total, 16 items were included in final scale.

Attitude was measured on an attitude scale by way of response of the respondents to each attitude item. The scoring pattern for positive items was 5,4,3,2 and 1 (Strongly agree, agree, undecided, disagree and strongly disagree) and vice-versa for negative items. The individual raw attitude scores of the respondent farmers were converted into tau score (Ƭ) by employing the formula given by Edward (1969) and then on the basis of Ƭ scores respondents were categorized into two categories on the basis of average attitude score.

Category	Score
Less favorable attitude	< average attitude score
More favorable attitude	> average attitude score

Reliability of the scale was tested using split half method and reliability coefficient was 0.96. The scale was examined for the content validity by determining how well the content of the scale represented the subject matter under study. As all the possible items covering content were selected through discussions with experts, subject matter specialists and from all the available literature on the subject, the scale satisfied the content validity.

Scores on psychological tests are frequently translated into Ƭ score in order to provide a standard interpretation of scores free from differences in means and standard deviations of the various tests. As a convenient frame of reference, the distribution of attitude scores for a given group translated into Ƭ score by using following formula as suggested by Edward (1969):

$$Ƭ = 50 + 10(X - \bar{X}/S)$$

Where Ƭ= Tau score; X, the score of a given subject; X, the arithmetic mean of the distribution; S, the standard deviation of the distribution of scores.

Linear regression model was applied to identify different socio-personal independent variables influencing the dependent variable i.e. attitude. The regression model was fitted on the basis of sampled observation and the fitted model is written as:

$$Y = a + b_1x_1 + b_2x_2 + + b_kx_k$$

where Y, predicted value of depended variables; a, intercept; b_i (i=1,2,….,k) are the estimated value of regression coefficient corresponding to i^{th} independent variable.

Entire analysis of data was carried out using Microsoft Office Excel and SPSS software.

RESULTS AND DISCUSSION

The rapeseed mustard growers were categorized into two levels of attitude on the basis of Ƭ score namely less favorable (< mean attitude score) and more favorable (> mean attitude score) (Table 1). In all the four study districts, overall 44% rapeseed mustard growers had less favorable and 56% had more favorable attitude. Similarly non-growers were also categorized into two levels of attitude. In all the four districts overall, 59% non-growers had less favorable and 41% had more favorable attitude towards rapeseed mustard cultivation. On the basis of observations, it was found that even among non-growers there was considerable variation in attitude towards cultivation of rapeseed-mustard crop. Non-growers, whose attitude was favourable, cited small size of land holding as the main reason for not opting the cultivation of rapeseed-mustard crop because they allocate their limited land holding for the cultivation of foodgrain crops such as wheat on priority basis.

Overall 48% respondent farmers had less favorable and 52% had more favorable attitude towards rapeseed mustard cultivation. The present findings got support from the study conducted by Monayemmiah *et al.* (2015) and Kumar *et al.* (2016) in which they reported that farmers showed positive attitude towards adoption of improved mustard varieties. Although rapeseed mustard is considered to be a profitable crop, many farmers showed less favourable attitude towards its cultivation due to some constraints like attack of aphids which drastically reduce its yield, manual harvesting and threshing as most of the farmers were of the view that harvesting and threshing of rapeseed-mustard crop is extremely labour intensive. Similarly, Yadav *et al.* (2017)

Table 1 Attitude of respondent farmers (in %) towards rapeseed mustard cultivation as per obtained Ƭ score

Category of farmers	Rapeseed mustard growers						Overall average N=280
	Attitude level	Samba	Jammu	Reasi	Doda	% age	
	Overall average attitude score = 51.00, S.D=10.00						
Rapeseed mustard growers (n= 50 from each district)	Less favorable attitude (< 51)	32	24	25	56	44	48
Non-growers (n= 20 from each district)	Less favorable attitude (< 51)	45	40	90	55	59	
Rapeseed mustard growers (n= 50 from each district)	More favorable attitude (> 51)	68	76	25	44	56	52
Non-growers (n= 20 from each district)	More favorable attitude (> 51)	55	60	10	45	41	
	t-value 2.176 p value .031*						

while studying attitude of farmers towards sustainability of Bt Cotton production technology found farmers' confusion regarding the adaptability of the upcoming new varieties of Bt Cotton although the attitude was positive and favourable with respect to sustainability dimensions. Statistically, there was significant difference between attitudes scores of growers and non-growers towards rapeseed mustard cultivation. (t-value = 2.176, P-value = 0.031) (Table 1). As such, there is significant difference in average attitude score (P value = 0.031) between the sampled farmers of sub-tropical (average attitude score 40.26) and temperate zone (average attitude score 37.02) of study area on comparison through two sample independent t-test.

The attitudinal disposition of farmers towards rapeseed mustard cultivation was clearly explained by analyzing each item in terms of its favourableness or unfavourableness. It is very clear that the item number '1' with highest mean score (2.89) ranked first showing the importance of rapeseed mustard crop in fulfilling the edible oil requirement of the family as well as whole country. The mean score of second item (2.82) revealed the favourableness of respondents to the idea that mustard crop is more prone to the attack of insects especially aphids which drastically reduce its productivity. The item number '3' was viewed as one of the highly unfavourable item (mean score 2.87) by the farmers which indicates that family size do not have any association with decision to adopt or not to adopt the cultivation of rapeseed mustard crop. The item number '4' was felt as one of the most favourable item with mean score 2.86 by the farmers which shows that cost of cultivation of rapeseed mustard crop is less as compared to other crops grown in the same season and fetches more profit. The item number '5' with mean score of 2.82 shows unfavourableness of farmers towards the idea that cultivation of rapeseed-mustard crop is more costly as compared to other crops. The sixth item having mean score of 2.80 shows the favourable attitude of respondent farmers that rapeseed mustard crop can be successfully cultivated in rainfed areas also and its cultivation can be undertaken even in those areas where there is no assured supply of irrigation. The seventh item with mean score of 2.82 shows favorableness of farmers' attitude that rapeseed mustard can be cultivated without much inter-cultivation practices. The eighth item with mean score of 2.73 shows the favourable attitude of farmers that leading mustard growers can act as source of inspiration for other farmers to adopt the cultivation of rapeseed-mustard crop. The ninth item with mean score of 2.62 shows the favourable attitude of farmers towards cultivation of improved varieties of rapeseed mustard crop. The tenth item having mean score 2.27 elucidated unfavourableness that rapeseed mustard crop is less advantageous. The eleventh item with mean score of 2.20 shows the unfavourable attitude of farmers that cultivation of other beneficial crops is the main reason behind less attention towards cultivation of rapeseed mustard crop. It is noticeable from the item number '12' (mean score 2.17) that majority of farmers had unfavourableness towards cultivation of rapeseed-mustard crop as complex one. The item ranked at thirteenth position shows favorableness of farmers' attitude that rapeseed mustard cultivation depends upon size of land holding. Items ranked at 14th and 15th with mean score of 1.89 and 1.69 position show the unfavourableness of the farmers towards unavailability of inputs and lack of government efforts to promote rapeseed mustard cultivation. The item number '16' was one of the least favourable item (mean score 1.14) by the farmers which show that cultivation of rapeseed mustard crop does not require any special technical skill. Similarly, Monayemiah *et al.* (2015) reported farmers having positive attitude towards adoption of improved mustard varieties since about 53% of the adopters wanted to increase area under improve mustard cultivation in next growing season considering the high yielding ability, low cultivation cost, high profit, and less labour requirements. Although it was considered to be a profitable crop, farmers also showed negative attitude towards its production due to some drawbacks.

On the basis of varied observations during field survey, it has been found that favourable attitude of farmers towards rapeseed mustard cultivation may be due to its importance as an important oilseed crop in the cropping pattern which fulfills the edible oil requirement, availability of different inputs required for its cultivation and its successful cultivation in hilly temperate areas even under snowfall conditions. On the other hand unfavourable attitude of the farmers is mainly due to the attack of aphid insect at flowering stage which hampers rapeseed-mustard productivity to a large extent and the other main reason observed for unfavourable attitude of farmers that harvesting and manual threshing of mature rapeseed-mustard crop is very complex and farm labour intensive activity. In the similar lines, the study of Singh (2012) reported the farmer's attitude towards adoption of recommended technology to increase productivity under dry land area and found that reasons for less favourable attitude was lack of adequate information, lack of technical know-how followed by irrigation and drainage, risk bearing capacity and lack of enthusiasm.

It was found that out of ten independent socio-personal variables, age (0.221**), education (0.168**), experience (0.178**), extension contacts (0.145**) and knowledge level (0.291**) had significant and positive correlation with attitude score of the respondent farmers towards cultivation of rapeseed mustard crop (Table 2).

It was found that out of five independent variables, age (P=.0048), level of education (P=0.008), and knowledge level about different production recommendations (0.000) significantly affected the attitude of respondent farmers towards cultivation of rapeseed mustard crop having R^2 value= 0.153 which indicates that model so applied has prediction power of 15% (Table 3). It might be due to reason that age, level of education of respondent farmers and knowledge level about different production recommendations help in developing positive and favourable attitude towards cultivation of rapeseed mustard crop.

On the basis of results it can be concluded that majority

Table 2 Correlation between attitude and socio-personal variables of respondent farmers

Socio-personal variables	r- value
Age	0.221**
Education	0.168**
Landholding	0.108
Experience	0.178**
Family type	0.000
Family size	-0.018
Occupation	0.049
Social participation	0.091
Extension contacts	0.145*
Knowledge level	0.291**

Table 3 Factors affecting the attitude of respondent farmers towards cultivation of rapeseed-mustard crop

Independent variables	Coefficient B	Std. Error	t-value	p-value	Model summary
(Constant)	30.140	1.335	22.574	0.000	R Square = .153
Age	0.090	0.045	1.986	0.048	
Education	0.136	0.051	2.674	0.008	Adjusted R
Experience	-0.029	0.049	-0.596	0.552	Square =.137
Extension contacts	0.648	0.431	1.505	0.133	
Knowledge	0.332	0.085	3.897	0.000	

of farmers had favourable attitude towards rapeseed-mustard cultivation as it keeps an important position in cropping pattern as an oilseed crop. Efforts need to be made especially on plant protection measures where majority of farmers had unfavourable attitude. Field extension functionaries need to motivate farmers to adopt proper recommended package of practices to improve present scenario of productivity of rapeseed mustard crop. Proper training programme should be conducted at periodic intervals to increase the knowledge of farmers about different production recommendations of rapeseed-mustard crop as knowledge significantly affects the attitude of the farmers towards rapeseed mustard cultivation. Enhanced productivity and profitability from rapeseed mustard crop can act as an important mean for influencing the farmers' attitude to be more favourable towards its cultivation.

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