Association of Independent Variables of Mustard Growers with their Level of Knowledge, Extent of Adoption and Level of Yields regarding Mustard Production Technology

S.R. Meena[1], G.S. Bangarva[2] and I.M. Khan[3]

1.Ph.D. Scholar, 2&3.Prof., Department of Extension Education, SKN College of Agriculture, Jobner, Rajasthan

Corresponding author e-mail: abhishek.mermat@gmail.com

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ABSTRACT

The present investigation was conducted in Bharatpur Region of Rajasthan State, India during the years 2014-15, 16-17. Thus study has been carried out total 250 mustard growers with the 125, beneficiary farmers and 125, non-beneficiary farmers regarding recommended mustard production technology in Bharatpur division. Thus, total sample sizes were consisted of 250 mustard growers using simple random sampling technique through proportionate. In Rajasthan, the rapeseeds and mustard crop is most popular oilseeds crops cultivated in this state, its grown on area of 25,32,330 hectares with an annual production of 32,57,987 tonnes and productivity of 1287 kg/ha. in the years 2015-16. Present study observed that the significant association out of six independent variables, correlation coefficient has shown positive and significant relationship in case of variables namely, Education level, Social participation, Extension participation, Source of information utilized, Economic motivation, and Irrigation potentiality had positively and significantly associated with the knowledge, adoption and yield level. Further study revealed that the non-significant association for age, size of land holding and risk orientation had negatively and non-significantly associated with the knowledge, adoption and yield level. It indicates that the beneficiary farmers had higher knowledge level as compared to non-beneficiary farmers amongst both the category of farmers regarding recommended mustard production technology.

Key words: *Impact; Knowledge; Adoption; Yield; Rapeseed-Mustard; Oilseeds crops;*

The Indian agriculture is considered to be back bone of Indian economy. About 24.70 per cent of the national income originates from the agricultural sector. About 75.00 per cent of its population and 66.67 per cent of labour force, directly or indirectly is dependent on agriculture for livelihood. A large number of important industries like jute, textiles, edible oils, tobacco, sugar etc., receive the raw materials produced by agriculture sectors. Agriculture is an important sector of the Indian economy, accounting for 14.00 per cent of the nation's GDP, about 11.00 per cent of its exports, about half of the population still relies on agriculture as principal source of income and it is a source of raw material for a large number of industries (*Anonymous, 2012-13*).

India has the 5th largest vegetable oils economy in the world next to USA, China, Brazil and Argentina accounting for 7.40 per cent world oilseeds output; 6.10 per cent of oils meal production; 3.90 per cent world oils meal export; 5.80 per cent vegetable oils production; 11.20 per cent of world oils import and 9.30 per cent of the world edible oils consumption. In India, oilseeds contribute 3.00 per cent and 10.00 per cent to gross national products and value of all agricultural products with 14.00 per cent and one million people involved in oilseeds cultivation and processing, respectively. India is one of the biggest importers of vegetable oils. There is a spurt in the vegetable oils consumption in recent years, both for edible purposes and industrial uses (*Anonymous, 2015*).

The major rapeseeds and mustard growing states are Haryana, MP Rajasthan and UP representing 81.00 per cent of the national acreage and contributing 82.90 per cent to the total rapeseeds and mustard production. Rajasthan is the largest rapeseeds-mustard growing state and alone contribute 38.20 per cent to the production of

the country from 39.30 per cent area. The other states with substantial acreage and production are Assam, Gujarat and West Bengal (*Rai, et. al., 2012*)

Keeping in view of the above facts in to consideration, the present research study was undertaken to assess *"The association between selected independent variables with their level of knowledge, extent of adoption and level of yields obtained amongst the mustard growers regarding recommended mustard production technology*".

METHODOLOGY

The present investigation was conducted in five selected Krishi Vigyan Kendra's – Navgaon (Alwar); Kumher (Bharatpur); Unella (Dholpur); Kermoda (Sawai-madhopur) and Hindoaun (Karoli)

The 25, beneficiary farmers who are getting benefits from the KVK and equal numbers of the non-beneficiary farmers were randomly selected from each of the selected KVKs. 125, beneficiary farmers and 125, non-beneficiary farmers were selected, in this way total 250 sample sizes for the present study by using simple random sampling technique through proportionate. The data were collected through personal interview method by interview schedule. Collected data were classified, tabulated, and statistically analyzed which led to the following salient findings. In order to test the validity of results and appropriate statistical tests were applied. The statistical tests applied were S.D., 'z' test, 't' test and rank correlation. The levels of significance for acceptance or rejection of hypotheses were 5 per cent and 1 per cent level of significant.

Nine independent variables have shown association with level of knowledge, extent of adoption and level of yields among the beneficiary and non-beneficiary farmers regarding recommended mustard production technology in 'zero order' correlation analysis. These variables entered in multiple regressions models were obtained and computerized.

$$Y = a + B_1x_1 + B_2x_2 + B_3x_3 + B_4x_4 + B_5x_5 + B_6x_6 + B_7x_7 + B_8x_8 + B_9x_9$$

Where,

Y = Estimated value with level of knowledge among the beneficiary farmers regarding recommended mustard production technology.

a = the intercept

B_1= CPR of Y on x_1 (Age)

B_2 = CPR of Y on x_2 (Education)

B_3 = CPR of Y on x_3 (Size of land holding)

B_4 = CPR of Y on x_4 (Social participation)

B_5 = CPR of Y on x_5 (Risk orientation)

B_6 = CPR of Y on x_6 (Extension participation)

B_7 = CPR of Y on x_7(Source of information utilized)

B_8 = CPR of Y on x_8 (Economic motivation)

B_9 = CPR of Y on x_9 (Irrigation potentiality)

Note- CPR=Coefficient of partial regression

RESULTS AND DISCUSSION

Associations between selected independent variables with their level of knowledge, extent of adoption and level of yields obtained amongst the beneficiary farmers and non-beneficiary farmers regarding recommended mustard production technology: In order to ascertain the associations between selected personal characteristics of rapeseed-mustard growers with their level of knowledge, extent of adoption and level of yields obtained with regard to recommended mustard production technology. Correlation and multiple regressions tests were applied. Paradigm showing associations between personal attributes with their level of knowledge, extent of adoption and level of yields obtained amongst the beneficiary farmers and non-beneficiary farmers regarding recommended mustard production technology is being presented here.

Table 1. Associations between independent variables and level of knowledge among the beneficiary farmers regarding recommended mustard production technology (N = 125)

Independent variables	'r' values
Age	-0.159^{NS}
Education level	0.534**
Size of land holding	0.137^{NS}
Social participation	0.270**
Risk orientation	0.108^{NS}
Extension participation	0.355**
Source of information utilized	0.197*
Economic motivation	0.442**
Irrigation potentiality	0.367**

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

Associations between independent variables and level of knowledge among the beneficiary farmers regarding recommended mustard production technology : The data reported in this Table 1 shows that education level, social participation, extension participation, economic

motivation and irrigation potentiality were found positively and significantly associated significance at 1 per cent level of probability related to level of knowledge among the beneficiary farmers with regard to recommended mustard production technology. While, source of information utilized was positively and significantly associated significance at 5 per cent level of probability related to level of knowledge among the beneficiary farmers with regard to recommended mustard production technology. It means that these variables were contributing and helping for increasing the level of knowledge among the beneficiary farmers in positive terms.

Further record of this finding reveals that independent variables namely age, size of land holding and risk orientation were non-significantly associated with level of knowledge among the beneficiary farmers with regard to recommended mustard production technology.

Table 2. Coefficient of multiple regressions of independent variables with level of knowledge among the beneficiary farmers regarding recommended mustard production technology (N= 125)

Independent variables	B-value (Reg.cof.)	s-error of B	t-value
Age	-.0882	0.804	-1.802^{NS}
Education level	-0.269	0.049	-5.473**
Size of land holding	0.879	0.244	3.601**
Social participation	-0.430	0.722	-0.595^{NS}
Risk orientation	-0.297	0.676	-0.439^{NS}
Extension participation	-4.948	1.324	-3.737**
Source of info. utilized	3.223	.574	5.613**
Economic motivation	4.169	1.119	3.727**
Irrigation potentiality	3.014	0.655	4.601**

*Significant at 0.05 level of probability

Determination coefficient R^2= 0.561

**Significant at 0.01 level of probability

Correlation R =0.749; F- Calculated =22.508 d.f.9, 115

Multiple regressions of independent variables with level of knowledge among the beneficiary farmers regarding recommended mustard production technology: The data reported in Table 2 that all the nine independent variables taken together explained to the extent of 56.10 per cent of the variation with level of knowledge among the beneficiary farmers about the package of practices with regard to recommended mustard production technology. The respective 'F' value was 22.508 at 9, 115 degree of freedom which was significant at 0.01 level of probability. Thus the results implied that the six variables had accounted for a significant amount of variation in the level of knowledge among the beneficiary farmers regarding recommended mustard production technology.

Further, it was also observed that 't' test of significance expressed coefficient of regression 'B' value were positively and significantly associated for education level (X_2), size of land holding (X_3), extension participation (X_6), source of information utilized (X_7), economic motivation (X_8) and irrigation potentiality (X_9) significance at 1 per cent level of probability. On the other hand, coefficients of regression (B-value) were non-significantly associated for age (X_1), social participation (X_4) and risk orientation (X_5). Thus, results of this analysis were indicative of the facts that education level, size of land holding, extension participation, source of information utilized, economic motivation and irrigation potentiality with level of knowledge among the beneficiary farmers were the most important predictors regarding recommended mustard production technology.

Associations between independent variables and level of knowledge among the non-beneficiary farmers regarding mustard production technology: There were associations between the selected independent variables and level of knowledge among the non-beneficiary farmers with regard to recommended mustard production technology. The coefficient of correlation 'r' values were calculated by applying zero order correlation (r) thus, results have been presented in this Table 3.

Table 3. Associations between independent variables and level of knowledge among the non-beneficiary farmers regarding recommended mustard production technology (N= 125)

Independent variables	'r' values
Age	-0.110^{NS}
Education level	0.489**
Size of land holding	0.104^{NS}
Social participation	0.370**
Risk orientation	0.145^{NS}
Extension participation	0.570**
Source of info. utilized	0.381**
Economic motivation	0.457**
Irrigation potentiality	0.188*

*Significant at 0.05 level of probability

**Significant at 0.01 level of probability

The data reported in this Table 3 that education level, social participation, extension participation, source of information utilized and economic motivation were

found positively and significantly associated significance at 1 per cent level of probability related to level of knowledge among the non-beneficiary farmers with regard to recommended mustard production technology. Whereas, irrigation potentiality was positively and significantly associated significance at 5 per cent level of probability related to level of knowledge among the non-beneficiary farmers with regard to recommended mustard production technology. It means that these variables were contributing and helping for increasing the level of knowledge among the non-beneficiary farmers in positive terms.

Further record of this finding reveals that independent variables namely age, size of land holding and risk orientation were non-significantly associated with level of knowledge among the non-beneficiary farmers with regard to recommended mustard production technology.

Table 4. Coefficient of multiple regressions of independent variables with level of knowledge among the non-beneficiary farmers regarding recommended mustard production technology. (N = 125)

Independent variables	B-value (Reg.cof.)	s-error of B	t-value
Age	-3.471	0.078	-0.446^{NS}
Education level	1.519	.425	3.578**
Size of land holding	0.530	1.151	0.460^{NS}
Social participation	2.487	1.059	2.347*
Risk orientation	-0.401	0.515	-0.778^{NS}
Extension participation	7.179	1.508	4.761**
Source of info utilized	1.358	0.278	4.884**
Economic motivation	-0.882	0.804	-1.097^{NS}
Irrigation potentiality	3.847	0.251	0.153^{NS}

* Significant at 0.05 level of probability
Determination coefficient R^2= 0.577
** Significant at 0.01 level of probability
Multiple correlation R =0.760
F- Calculated =21.236 d.f.9, 115

Multiple regressions of independent variables with level of knowledge among the non-beneficiary farmers regarding recommended mustard production technology: The data reported in this Table 4 that all the nine independent variables taken together explained to the extent of 57.70 per cent of the variation for the level of knowledge among the non-beneficiary farmers about the package of practices with regard to recommended mustard production technology. The respective 'F' value was 21.236 at 9, 115 degree of freedom which was significance at 0.01 level of probability. Thus the results implied that the forth variables had accounted for a significant amount of variation in the level of knowledge among the non-beneficiary farmers regarding recommended mustard production technology.

Further, it was also observed that 't' test of significance expressed coefficient of regression 'B' value were positively and significantly associated for education level (X_2), extension participation (X_6) and source of information utilized (X_7) significance at 1 per cent of probability. While, coefficient of regression 'B' value was positively and significantly associated for social participation (X_4) significance at 5 per cent level of probability related to level of knowledge among the non-beneficiary farmers with regard to recommended mustard production technology. On the other hand, coefficient of regression (B-value) were non-significantly associated for age (X_1), size of land holding (X_3), risk orientation (X_5), economic motivation (X_8) and irrigation potentiality (X_9). Thus, results of this analysis were indicative of the facts that education level, social participation, extension participation and source of information utilized among the non-beneficiary farmers were the most important predictors with level of knowledge regarding recommended mustard production technology.

Table 5. Associations between independent variables and extent of adoption among the beneficiary farmers regarding recommended mustard production technology (N= 125)

Independent variables	'r' values
Age	-0.111^{NS}
Education level	0.577**
Size of land holding	0.112^{NS}
Social participation	0.447**
Risk orientation	0.110^{NS}
Extension participation	0.449**
Source of information utilized	0.409**
Economic motivation	0.385**
Irrigation potentiality	0.358**

* Significant at 0.05 level of probability
** Significant at 0.01 level of probability

Associations between independent variables and extent of adoption among beneficiary farmers regarding recommended mustard production technology: There were associations between the selected independent variables and extent of adoption among the beneficiary

farmers with regard to recommended mustard production technology. The coefficient of correlation 'r' values were calculated by applying zero order correlation (r) thus, results have been presented in this Table 5.

The data reported in this Table 5 that education level, social participation, extension participation, source of information utilized, economic motivation and irrigation potentiality were found positively and significantly associated significance at 1 per cent level of probability related to extent of adoption among the beneficiary farmers with regard to recommended mustard production technology. It means that these variables were contributing and helping for increasing the extent of adoption among the beneficiary farmers in positive terms.

Further record of this finding reveals that independent variables namely age, size of land holding and risk orientation were non-significantly associated with extent of adoption among the beneficiary farmers with regard to recommended mustard production technology.

Table 6. Coefficient of multiple regressions of independent variables with extent of adoption among the beneficiary farmers regarding recommended mustard production technology (N= 125)

Independent variables	B-value (Reg.cof.)	s-error of B	t-value
Age	8.366	.053	1.587^{NS}
Education level	1.629	0.330	4.940**
Size of land holding	-0.530	0.830	-0.639^{NS}
Social participation	1.725	0.671	2.570*
Risk orientation	-0.336	0.271	-1.243^{NS}
Extension participation	1.311	0.717	1.828^{NS}
Source of info. utilized	0.532	0.109	4.897**
Economic motivation	0.450	0.310	1.451^{NS}
Irrigation potentiality	-4.378	0.141	-0.311^{NS}

* Significant at 0.05 level of probability;
Determination coefficient R^2= 0.532;
** Significant at 0.01 level of probability;
Multiple correlation R =0.729;
F- Calculated =17.672 d.f.9, 115;

Multiple regressions of independent variables with extent of adoption among the beneficiary farmers regarding recommended mustard production technology: The data reported in this Table 6 that all the nine independent variables taken together explained to the extent of 53.20 per cent of the variation for the extent of adoption among the beneficiary farmers in the improved practices with regard to recommended mustard production technology. The respective 'F' value was 17.672 at 9, 115 degree of freedom which was significance at 0.01 level of probability. Thus the results implied that the three variables had accounted for a significant amount of variation in the extent of adoption among the beneficiary farmers regarding recommended mustard production technology.

Further, it was also observed that 't' test of significance expressed coefficient of regressions 'B' value were positively and significantly associated for education level (X_2), social participation (X_4) and source of information utilized (X_7) significance at 1 per cent level of probability. Whereas, coefficient of regressions 'B' value were positively and significantly associated for age (X_1), size of land holding (X_3), risk orientation (X_5), extension participation (X_6) economic motivation (X_8) and irrigation potentiality (X_8) significance at 5 per cent level of probability related to extent of adoption among the beneficiary farmers with regard to recommended mustard production technology. On the other hand, coefficient of regressions (B-value) were non-significantly associated for age (X_1), size of land holding (X_3), risk orientation (X_5), extension participation (X_6) economic motivation (X_8) and irrigation potentiality (X_8). Thus results of this analysis were indicative of the facts that education level, social participation and source of information utilized were the most important predictors of the extent of adoption among the beneficiary farmers regarding recommended mustard production technology.

Associations between independent variables and extent of adoption among the non-beneficiary farmers regarding recommended mustard production technology: The data reported in this Table 7 shows that education level, social participation, extension participation, economic motivation and irrigation potentiality were found positively and significantly associated significance at 1 per cent level of probability related to extent of adoption among the non-beneficiary farmers with regard to recommended mustard production technology. Whereas, source of information utilized was positively and significantly associated significance at 5 per cent level of probability related to extent of adoption among the non-beneficiary farmers with regard to recommended mustard production technology. It means that these variables were contributing towards the extent of adoption among the non-beneficiary farmers regarding recommended mustard production technology in positive terms.

Table 7. Associations between independent variables and extent of adoption among the non-beneficiary farmers regarding recommended mustard production technology. (N = 125)

Independent variables	'r' values
Age	-0.099^{NS}
Education level	0.557**
size of land holding	0.061^{NS}
Social participation	0.397**
Risk orientation	0.111^{NS}
Extension participation	0.512**
Source of information utilized	0.199*
Economic motivation	0.527**
Irrigation potentiality	0.461**

* Significant at 0.05 level of probability
** Significant at 0.01 level of probability

Further record of this finding reveals that independent variables namely age, size of land holding and risk orientation were non-significantly associated with extent of adoption among the non-beneficiary farmers with regard to recommended mustard production technology.

Table 8. Coefficient of multiple regressions of independent variables with extent of adoption among the non-beneficiary farmers regarding recommended mustard production technology (N = 125)

Independent variables	B-value (Reg.cof.)	s-error of B	t-value
Age	-6.253	0.046	-1.363^{NS}
Education level	1.518	0.232	6.550**
Size of land holding	-0.573	0.665	-0.861^{NS}
Social participation	1.455	0.600	2.426*
Risk orientation	4.067	1.120	3.630**
Extension participation	22.420	5.055	4.435**
Source of info. utilized	0.192	0.148	1.295^{NS}
Economic motivation	-10.591	2.654	-3.991**
Irrigation potentiality	0.966	0.155	6.243**

* Significant at 0.05 level of probability,
** Significant at 0.01 level of probability,
Determination coefficient R^2= 0.637,
Multiple correlation R =0.798
F- Calculated =27.252 d.f.9, 115

Multiple regressions of independent variables with extent of adoption among the non-beneficiary farmers regarding recommended mustard production technology: The Table 8 indicated that all the nine independent variables taken together explained to the extent of 63.70 per cent of the variation in the extent of adoption among the non-beneficiary farmers in the improved practices with regard to recommended mustard production technology. The respective 'F' value was 27.252 at 9, 115 degree of freedom which was significance at 0.01 level of probability. Thus the results implied that the six variables had accounted for significant of variation related to the extent of adoption among the non-beneficiary farmers regarding recommended mustard production technology.

Further, it was also observed that 't' test of significance expressed coefficient of regression 'B' value were positively significant for education level (X_2), social participation (X_4), risk orientation (X_5), extension participation (X_6) economic motivation (X_8) and irrigation potentiality (X_8) significance at 1 per cent level of probability. Whereas, age (X_1), size of land holding (X_3) and source of information utilized (X_7) were positively and significantly associated significance at 5 per cent level of probability related to extent of adoption among the non-beneficiary farmers with regard to recommended mustard production technology. On the other hand, coefficient of regression (B-value) were non-significant for age (X_1), size of land holding (X_3) and source of information utilized (X_7). The results of the analysis were indicative of the fact that education level, social participation, risk orientation, extension participation, economic motivation and irrigation potentiality were the most important predictors of the extent of adoption among the non-beneficiary farmers regarding recommended mustard production technology.

Associations between independent variables and level of yields obtained among the beneficiary farmers regarding recommended mustard production technology: The data reported in Table 9 that positively and significantly associated education level, social participation, extension participation, source of information utilized, economic motivation and irrigation potentiality were found significance at 1 per cent level of probability related to level of yields obtained among the beneficiary farmers with regard to recommended mustard production technology. Whereas, economic motivation was positively and significantly associated significance at 5 per cent level of probability related to level of yields obtained among the beneficiary farmers with regard to recommended mustard production technology. It means that these variables were

contributing towards the level of yield among the beneficiary farmers in positive terms.

Table 9. Associations between independent variables and level of yields obtained among the beneficiary farmers regarding recommended mustard production technology (N= 125)

Independent variables	'r' values
Age	0.023^{NS}
Education level	0.570**
size of land holding	0.023^{NS}
Social participation	0.475**
Risk orientation	-0.002^{NS}
Extension participation	0.410**
Source of information utilized	0.412**
Economic motivation	0.208*
Irrigation potentiality	0.375**

* Significant at 0.05 level of probability
** Significant at 0.01 level of probability

Further record of this finding reveals that independent variables namely age, size of land holding and risk orientation were non-significantly associated with level of yields obtained among the beneficiary farmers regarding recommended mustard production technology.

Table 10. Coefficient of multiple regressions of independent variables with level of yields obtained among the beneficiary farmers (N= 125)

Independent variables	B-value (Reg.cof.)	s-error of B	t-value
Age	1.498	0.029	0.514^{NS}
Education level	0.778	0.160	4.847**
size of land holding	-0.335	0.429	-.780^{NS}
Social participation	0.914	0.336	2.722*
Risk orientation	-5.202	0.128	-0.408^{NS}
Extension participation	0.927	0.330	2.810*
Source of info. utilized	0.204	0.059	3.462**
Economic motivation	-9.374	0.160	-0.587^{NS}
Irrigation potentiality	0.142	0.069	2.061*

*Significant at 0.05 level of probability
Determination coefficient R^2= 0.508
** Significant at 0.01 level of probability
Multiple correlation R =0.713
F- Calculated =16.047 d.f.9, 115

Multiple regressions of independent variables with level of yields obtained among the beneficiary farmers regarding recommended mustard production technology: The Table 10 indicates that all the nine independent variables taken together explained to the extent of 50.80 per cent of the variation in the level of yields among the beneficiary farmers with regard to recommended mustard production technology. The respective 'F' value was 16.047 at 9, 115 degree of freedom which was significance at 0.01 level of probability. Thus the results implied that the five variables had a significant account of variation related to the level of yields obtained among the beneficiary farmers regarding recommended mustard production technology.

Further, it was also observed that 't' test of significance expressed coefficient of regression 'B' value were positively and significantly associated for education level (X_2) and source of information utilized (X_7) significance at 1 per cent of probability. Whereas coefficient of regression 'B' value were positively and significantly associated for social participation (X_4), extension participation (X_6) and irrigation potentiality (X_9) significance at 5 per cent level of probability related to level of yields obtained among the beneficiary farmers regarding recommended mustard production technology. On the other hand, coefficient of regression (B-value) ware non- significantly associated for age (X_1), size of land holding (X_3), risk orientation (X_5) and economic motivation (X_8). The results of the analysis were indicative of the fact that education level, social participation, extension participation, source of information utilized and irrigation potentiality were the most important predictors with their level of yields among the beneficiary farmers regarding recommended mustard production technology.

Associations between independent variables and level of yields obtained among the non-beneficiary farmers regarding recommended mustard production technology: The data reported in this Table 11. shows that education level, social participation, extension participation, economic motivation and irrigation potentiality were found positively and significantly associated significance at 1 per cent level of probability related to level of yields obtained among the non-beneficiary farmers with regard to recommended mustard production technology. Whereas social participation, source of information utilized were positively and significantly associated significance at 5 per cent level of probability related to level of yields obtained among the non-beneficiary farmers with regard to recommended mustard production technology. It means that these variables were contributing towards with level of yield obtained from the non-beneficiary farmers in positive terms.

Table 11. Associations between independent variables and level of yields obtained among the non-beneficiary farmers regarding recommended mustard production technology (N = 125)

Independent variables	'r' values
Age	0.074^{NS}
Education level	0.554**
Size of land holding	0.008^{NS}
Social participation	0.203*
Risk orientation	-0.141^{NS}
Extension participation	0.328**
Source of information utilized	0.185*
Economic motivation	0.471**
Irrigation potentiality	0.362**

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

Further record of this finding reveals that independent variables namely age, size of land holding and risk orientation were non-significantly associated with level of yields obtained among the non-beneficiary farmers with regard to recommended mustard production technology.

Table 12. Coefficient of multiple regressions of independent variables with level of yields obtained among the non-beneficiary farmers regarding mustard production technology (N = 125)

Independent variables	B-value (Reg.cof.)	s-error of B	t-value
Age	1.107	0.024	0.467^{NS}
Education level	0.639	0.123	5.193**
size of land holding	0.214	0.306	0.699^{NS}
Social participation	-0.3.411	0.280	-0.122^{NS}
Risk orientation	-0.349	0.098	-3.545*
Extension participation	0.375	0.258	1.453^{NS}
Source of info. utilized	0.212	0.069	3.048*
Economic motivation	.402	.111	3.607**
Irrigation potentiality	.155	.055	2.801*

*Significant at 0.05 level of probability

Determination coefficient R^2= 0.508

** Significant at 0.01 level of probability

Multiple correlation R =0.712

F- Calculated =16.0315 d.f.9, 115

Multiple regressions of independent variables with level of yields obtained among the non-beneficiary farmers regarding recommended mustard production technology: The Table 12 indicates that all the nine independent variables taken together explained to the extent of 50.80 per cent of the variation for the level of yields among the non-beneficiary farmers in the improved practices with regard to recommended mustard production technology. The respective 'F' value was 16.0315 at 9, 115 degree of freedom which was significant at 0.01 level of probability. Thus the results implied that the five variables had a significant account of variation related to the level of yields obtained among the non-beneficiary farmers regarding recommended mustard production technology.

Further, it was also observed that 't' test of significance expressed coefficient of regression 'B' value were positively and significantly associated for education level and economic motivation (X_8) significance at 1 per cent level of probability. Whereas, risk orientation (X_5), source of information utilized (X_7) and irrigation potentiality (X_9) were positively and significantly associated significance at 5 per cent level of probability related to level of yields obtained among the non-beneficiary farmers with regard to recommended mustard production technology. On the other hand, coefficient of regression (B-value) were non-significant for age (X_1), size of land holding (X_3) social participation (X_4) and extension participation (X_6). Thus, results of this analysis were indicative of the facts that education level, social participation, risk orientation, source of information utilized, economic motivation and irrigation potentiality were the most important predictors with their level of yields obtained among the non-beneficiary farmers regarding recommended mustard production technology.

The findings are similar in conformity with the finding of *Khan and Chauhan (2005), Chander et.al. (2009), Gopal, Prasad. (2011), Asiwal et.al. (2012), Badhala (2012), Sunita, K. (2012), Mandavkar et.al. (2013).*

CONCLUSION

The study concluded that education level, social participation, extension participation, source of information utilized, economic motivation and irrigation potentiality were found positively and significantly associated. Whereas, there were no association between age, size of land holding and risk orientation with their knowledge level by the beneficiary farmers and by the non-beneficiary farmers regarding recommended mustard production technology. It was also observed that 't' test of significance expressed coefficient of

regression 'b' value were positively significant for education level (X_2), size of land holding (X_3), Extension participation (X_6), source of information utilized (X_7), economic motivation (X_8) and irrigation potentiality (X_9) at 1 per cent level of probability. On the other hand, coefficients of regression (b-value) were non-significant for age (X_1), social participation (X_4) and risk orientation (X_5) with their knowledge level by the beneficiary farmers regarding recommended mustard production technology.

In study that there were no associations between age, size of land holding and risk orientation with their level of yields obtained by the beneficiary farmers and the non-beneficiary farmers regarding recommended mustard production technology. It was also observed age (X_1), size of land holding (X_3) social participation(X_4) and extension participation (X_6) with their level of yields obtained by the non-beneficiary farmers regarding recommended mustard production technology.

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