Indian Journal of Extension Education
Vol. 54, No. 4, 2018 (18-24)

Knowledge Level of Rapeseed Mustard Growers of Sub-tropical and Temperate Region of Jammu and Kashmir State

Rakesh Kumar[1], P. S. Slathia[2], Rajinder Peshin[3] S.K. Gupta[4] and S.K. Gupta[5]

ABSTRACT

The present research pursuit was undertaken to know the existing knowledge level of rapeseed mustard growers about different production and protection technologies of rapeseed mustard cultivation. The study was mainly conducted in subtropical and temperate region of Jammu division. The study revealed that from four districts 46.00 per cent of respondents had medium knowledge followed by 40.00 per cent respondents had low knowledge and only 14.00 per cent respondents had high knowledge respectively. The overall mean knowledge score was 9.98 (± 2.39). Majority of respondents (99.00%) had knowledge about insects and weeds of rapeseed mustard crop, (98.00%) of respondents had knowledge about thinning practice, (97.00%) and (81.00%) had knowledge of methods of weed control and time of thinning, (72.00%), (54.00%) and (53.00%) had knowledge of intercropping, quantity of urea and DAP fertilizer to be used in rapeseed mustard cultivation. Less percentage of respondents had knowledge about seed treatment, insecticides to be used against insects attacking rapeseed mustard crop. ANOVA results revealed that there was significant difference in knowledge level of mustard growers belonging to districts falling under sub-tropical zone as compared to temperate zone.

Keywords: Knowledge level, rapeseed mustard, production, protection, practices

INTRODUCTION

Rapeseed mustard is an important Rabi oilseed crop of India. Rapeseed mustard group mainly consists of toria *(Brassica rapa)*, raya *(Brassica juncea)* and gobhi sarson *(Brassica napus)*. In India, it contributes nearly 80 per cent of the total *rabi* oilseed production. Area under rapeseed mustard is 6.3 million ha with a production of 7.4 metric tonnes and productivity of 11.76 q/ha. (Directorate of Rapeseed Mustard Research, 2013). In terms of rapeseed mustard productivity, global ranking of India is 28th (Bhardwaj, 2013). There is variation in the production and productivity of rapeseed mustard in different states. In Jammu & Kashmir (J&K) state, rapeseed mustard production scenario is not very encouraging despite its paramount importance for human beings and animals. The productivity of rapeseed mustard in J&K is 6.98 q/ha. (Anonymous, 2013), which is far less than the national average. Adequate knowledge about different production recommendations of rapeseed mustard crop is must on the part of farmers to increase its productivity so that existing scenario of total oilseed production may be changed satisfactorily in general and rapeseed mustard crop in particular. Knowledge is a "Behavior and test situation which emphasizes the remembering either by recognition or recall of ideas, material or phenomenon" (Bloom, 1979). It is one of the important components of behaviour and as such plays

[1, 2, 3] Division of Agricultural Extension Education, [4] Division of Agroforestry, [5] Division of Genetics and Plant Breeding, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, J & K.

an important role in the covert and overt behaviour of an individual (Ray and Mondal, 1999).

Once the knowledge is acquired, it produces change in thinking process of an individual which would lead to further change in attitude and help the farmers in making rational decisions. Knowledge is also a pre-requisite for adoption of any agricultural innovation. Knowledge provides impetus to the adoption process.

Therefore knowledge test to measure the knowledge of farmers about different production recommendations of rapeseed mustard crop was developed and used for assessing the knowledge level of rapeseed mustard growers in the study area.

METHODOLOGY

Stratified random sampling technique was employed for selection of districts for the present study. At first stage all the ten districts of Jammu division were divided into two strata. First strata includes districts having overall maximum area falling under sub-tropical zone and second strata includes districts having maximum area under temperate zone. From sub-tropical zone, Jammu & Samba district, whereas from temperate zone, Reasi & Doda were purposively selected on the basis of maximum area under rapeseed mustard crop in these districts. Based on the maximum area under rapeseed mustard crop, two blocks from each district were selected purposively. R.S.Pura & Bishnah blocks from Jammu district, Purmandal & Vijaypur blocks from Samba district, Mahore & Arnas blocks from Reasi district and Bhaderwah and Marmat blocks from Doda district were selected purposively. A list of rapeseed mustard growers for each of the selected block was prepared with the help of concerned agencies. From a total list of 1177 rapeseed mustard growers in the selected blocks, 25 rapeseed mustard growers from each block were selected by random sampling method making a total sample size of 200 rapeseed mustard growers. Pretested knowledge test was used for assessing the knowledge level of the rapeseed mustard growers.

RESULTS AND DISCUSSION

Practice wise knowledge possessed by rapeseed mustard growers

The knowledge of rapeseed mustard growers was measured about seven main practices and its sub practices of rapeseed mustard cultivation. The major seven practices were discussed as under: Sowing (seed rate, spacing, seed treatment and its dosages) and inter-cropping, weed management, Water management and Thinning, nutrient management and plant protection

Knowledge of rapeseed mustard growers about different aspects of sowing(seed rate, spacing and seed treatment) and intercropping

The data presented in the Table 1 revealed that 39 per cent mustard growers were having knowledge about recommended seed rate followed by 22.00 per cent growers who had correct knowledge about spacing in case of line sowing and only 6 per cent growers had knowledge about name of chemical and its dosages to be used for seed treatment The data presented in the table further reveals that 72 per cent mustard growers were having knowledge about different crops which can be successfully inter-cropped with rapeseed mustard crops.

Knowledge of rapeseed mustard growers about recommended weed management, water management and thinning practice

Data presented in the Table 2 revealed that 99 per cent mustard growers had knowledge about different weeds of mustard crop followed by 97 per cent growers who had the knowledge about weed control by hoeing. The data presented in table further depict that only 1 per cent growers had knowledge about herbicides to be used for weed control in mustard crop and that too in Jammu district only. Overall 56 per cent mustard growers had knowledge about timing of first irrigation to be given to mustard crop followed by 47 per cent growers who possessed the knowledge about recommended number of irrigations to be given to rapeseed mustard crop. The

Table 1: Knowledge of rapeseed mustard growers about different aspects of sowing (seed rate, spacing and seed treatment) and intercropping

Knowledge about	District wise per cent of respondents				Overall
	Samba (n=50)	Jammu (n=50)	Reasi (n=50)	Doda (n=50)	Per cent (n=200)
Recommended seed rate (5kg/ha)	62	78	14	2	39
Spacing in case of line sowing of rapeseed mustard (30x10cm)	26	40	18	4	22
Name of chemical to be used for seed treatment (Carbondiazim)	8	12	0	2	6
Dosage of seed treatment chemical(2.5 to 3gms /kg of seed)	10	10	0	2	6
Crops which can be inter-cropped with rapeseed mustard (Wheat, pea, gram etc)	86	64	64	76	72

Table 2: Knowledge of rapeseed mustard growers about recommended weed management, water management and thinning practice

Knowledge about	District wise per cent of respondents				Overall
	Samba (n=50)	Jammu (n=50)	Reasi (n=50)	Doda (n=50)	Per cent (n=200)
Weeds of rapeseed mustard crop *Chenopodium album* (bathu) *Phlaris minor* (Sitti) *Meliolotus indica* (mena)	100	100	100	96	99
Weeds control methods in rapeseed mustard crop Manual hoeing Chemical control	960	964	980	980	9701
Recommended number of irrigations(02)	60	64	34	30	47
First irrigation (20-25 DAS)	64	94	38	28	56
Thinning practice	98	100	98	96	98
Time of thinning (10 to 15 DAS)	72	86	96	68	81
Spacing after thinning (30x10cm)	66	76	68	26	59

data presented in the table further reveals that overall 98 per cent mustard growers had knowledge about thinning in rapeseed mustard crop followed by 81 per cent growers who had the knowledge about recommended stage of thinning and 59 per cent mustard growers possessed the knowledge about recommended spacing to be kept after thinning.

Knowledge of rapeseed mustard growers about recommended nutrient management practices

Data presented in the Table 3 clear that overall 92 per cent mustard growers had knowledge about recommended quantity of farmyard manure to be used for rapeseed mustard crop followed by 54 per cent growers who had knowledge about recommended quantity of DAP fertilizer to be used in mustard crop, 53 per cent growers had the knowledge about recommended quantity of urea to be used and only 31 per cent mustard growers possessed the correct knowledge about number of splits in which urea to be applied in mustard crop.

Knowledge of rapeseed mustard growers about recommended plant protection practices

Data presented in Table 4 showed that overall 99 per cent rapeseed mustard growers had correctly identified mustard aphid locally known as *"tela"* attacking mustard crop at flowering stage followed by 42 per cent growers who identified the white rust of crucifers disease attacking mustard crop. Only 6 per cent mustard growers had the knowledge about the correct name and dosages of insecticide to be used against mustard aphid. The present findings got support from the study conducted by Mandavkar *et*

Table 3: Knowledge of rapeseed mustard growers about recommended nutrient management practices

Knowledge about	District wise per cent of respondents				Overall
	Samba (n=50)	Jammu (n=50)	Reasi (n=50)	Doda (n=50)	Per cent (n=200)
Dosage of urea	68	70	26	48	53
Dosage of DAP	74	90	16	38	54
Split dosages of urea (two splits recommended)	62	46	12	4	31
Quantity of FYM/ha (15to 20 ton /ha)	78	96	98	94	92

Recommended kg/ha Urea in raya=105kg/ha, Urea in gobi sarson=100kg/ha, Urea in toria= 50kg/ha DAP in raya=65kg/ha, DAP in gobi sarson=88kg/ha DAP in toria=40kg/ha

Table 4: Knowledge of rapeseed mustard growers about recommended plant protection practices

Knowledge about	District wise per cent of respondents				Overall
	Samba (n=50)	Jammu (n=50)	Reasi (n=50)	Doda (n=50)	Per cent (n=200)
Diseases attacking rapeseed mustard crop	30	26	54	58	42
White rust of crucifers (*Albugo candida)*					
Insect attacking rapeseed mustard crop	98	100	98	100	99
Mustard Aphid (*Lipaphis erysimi*)					
Insecticide to be used (Imidachloropid)	8	10	0	6	6
Dosage of insecticide to be used	6	14	0	2	6

al. (2013) in which it is reported that farmers had poor knowledge about plant protection practices in mustard crop.

Knowledge level of mustard growers about rapeseed mustard cultivation practices

Categorization of mustard growers has been done in Table 5. The mustard growers were categorized into three levels of knowledge namely low (5-9), medium (10-12) and high (13-20) by employing Singh cube root method (1975). In Samba district 60.00 per cent growers had medium level of knowledge followed by 20.00 per cent growers who were in low as well as high level of knowledge category each respectively. The mean knowledge score was 11.72 (±2.05) In Jammu district 78.00 per cent growers had medium knowledge followed by 14.00 per cent growers who had low level of knowledge and only 8.00 per cent growers had high level of knowledge. The mean knowledge score was 11.44. In *Reasi* district 66.00 per cent growers had low level of knowledge followed by 28.00 per cent growers who had medium level of knowledge and only 6.00 per cent growers had high level of knowledge. The mean knowledge score was 9.00 (±1.69). In Doda district 62.00 per cent growers had low level of knowledge followed by 36.00 per cent growers who had medium level of knowledge and

Table 5: Knowledge level of mustard growers about rapeseed mustard cultivation practices

Knowledge	Samba (n=50)	Jammu (n=50)	Reasi (n=50)	Doda (n=50)	Overall (n=200)
Average knowledge score	10.78±2.05	11.44±2.34	9.0±1.69	8.7±2.25	9.98±2.39
Knowledge level (per cent farmers)					
Low (5-9)	20	14	66	62	40
Medium (10-12)	60	78	28	36	46
High (13-20)	20	8	6	2	14

only 2.00 per cent growers had high knowledge. The mean knowledge score was 8.7 (±2.25)

Overall in all the four districts 46.00 per cent mustard growers had medium level of knowledge followed by 41.00 per cent, who had low level of knowledge and only 14.00 per cent growers had high level of knowledge regarding different rapeseed mustard production recommendations respectively. The overall mean knowledge score was 9.98 (± 2.39).

Knowledge gap of rapeseed mustard growers in different practices of rapeseed mustard cultivation

Data presented in the Table 6 indicates the knowledge gap related to different sowing aspects such as seed rate, seed treatment, spacing in case of line sowing, inter-cropping, weed management, water management, thinning, nutrient management and plant protection. There was significant difference between the maximum obtainable knowledge scores of respondents. The knowledge gap was quantified by subtracting the actual knowledge score from the maximum obtainable knowledge score. Overall maximum mean knowledge score was 2.30 related to thinning and nutrient management each and overall minimum mean knowledge score was 0.72 related to sowing and inter-cropping. Overall maximum difference was in case of different aspects of sowing

Table 6: Knowledge gap of rapeseed mustard growers in different practices of rapeseed mustard cultivation

Major Practices	District wise mean knowledge Score				Overall mean knowledge score obtained	Maximum obtainable	Knowledge gap per cent	
	Samba (n=50)	Jammu (n=50)	Reasi (n=50)	Doda (n=50)			Gap	(percentage)
Sowing aspects (seed rate, seed treatment and its dosage and spacing)	1.06	1.40	0.32	0.10	0.72	4.00	3.28	82.00
Inter-cropping	0.86	0.64	0.64	0.76	0.72	1.00	0.28	28.00
Weed management	1.96	1.96	1.98	1.94	1.96	2.00	0.04	2.00
Water management	1.24	1.58	0.72	0.58	1.03	2.00	0.97	48.50
Thinning	2.36	2.62	2.62	1.90	2.30	3.00	0.70	23.33
Nutrient management	2.82	3.02	1.52	1.84	2.30	4.00	1.70	42.50
Plant protection	1.42	1.50	1.52	1.66	1.52	4.00	2.48	62.00

Table 7: One way analysis of variance of knowledge scores obtained by the growers in different districts

Knowledge	Sum of Squares	df	Mean Square	F	P-value
Between Groups	268.520	3	89.507	19.859	.000
Within Groups	883.400	196	4.507		
Total	1151.920	199			
Variable	**(I) district**	**(J) district**	**Mean Difference (I-J)**	**Std. Error**	**p-value**
Knowledge	Samba	Jammu	-.66000	.42460	.122
		Reasi	1.78000*	.42460	.000
		Doda	2.08000*	.42460	.000
	Jammu	Samba	.66000	.42460	.122
		Reasi	2.44000*	.42460	.000
		Doda	2.74000*	.42460	.000
	Reasi	Samba	-1.78000*	.42460	.000
		Jammu	-2.44000*	.42460	.000
		Doda	.30000	.42460	.481
	Doda	Samba	-2.08000*	.42460	.000
		Jammu	-2.74000*	.42460	.000
		Reasi	-.30000	.42460	.481

Table 8: Factors affecting the knowledge of rapeseed mustard growers about different production recommendations

Independent variables	Coefficient B	Std. Error	t-value	p-value	Model summary
(Constant)	**7.569**	**.946**	**8.003**	**.000**	R Square =.157=.112
Age	.057	.032	1.766	.079	Adjusted R Square
Education	.081	.040	2.022	**.045**	
Land holding	-.328	.155	-2.126	**.035**	
Irrigated land holding	.680	.162	4.195	**.000**	
Experience	-.048	.036	-1.309	.192	
Social participation	-.530	.584	-.907	.366	
Main occupation	.629	.383	1.640	.103	
Distance from agri. office	.013	.024	.542	.589	
Extension contact	.174	.312	.558	.578	
Family type	-.542	.398	-1.361	.175	

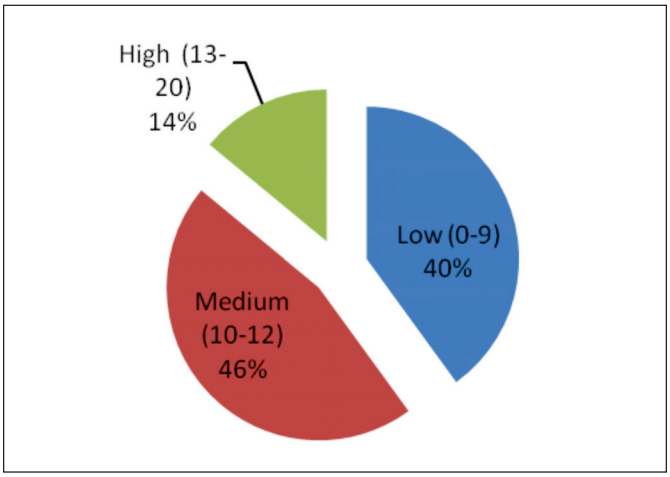

Fig 1: Knowledge level of rapeseed mustard growers

which was 82 per cent followed by 62.00 per cent about plant protection measures. Overall lowest knowledge gap was observed in case of weed management.

One way analysis of variance of knowledge scores obtained by the growers in different districts

Data presented in table 7 show that there was significant difference in knowledge score of mustard growers of Samba and Reasi (p-value=.000), Samba and Doda (p-value=.000), Jammu and Reasi (p-value=.000), Jammu and Doda (p-value=.000) districts with F-value 19.859

Factors affecting the knowledge of rapeseed mustard growers about different production recommendations

The data presented in table 8 show that out of ten independent variables, level of education (p=.045), size of land holding (p=.035) and irrigated land holding (.000) significantly affected the knowledge of mustard growers about different production recommendations practices having R^2 value= 0.157 which indicates that model so applied has prediction power of 15 per cent. The findings of the study are in line with the studies conducted by the Singh *et al.* (2011) & Mandavkar *et al.* (2013) in which it is reported that big land holding farmers had high knowledge as compared to small and medium category of farmers and education level is also positively and significantly correlated with the knowledge level of the farmers about recommended technology of mustard cultivation.

Thus concerned agencies should try to increase the irrigation and education facilities in the study area which will result in better knowledge and adoption of agricultural technology in general and rapeseed mustard in particular.

CONCLUSION

It can be concluded from the results that majority of farmers of sub-tropical and plain district possessed good knowledge as compared to the mustard growers of temperate and hilly districts. Moreover (99.00%) had knowledge about insects and weeds of rapeseed mustard crop, (98.00%) of respondents had knowledge about thinning practice, (97.00%) and (81.00%) had knowledge of methods of weed control

and time of thinning, (72.00%), (54.00%) and (53.00%) had knowledge of intercropping, quantity of urea and DAP fertilizer to be used in rapeseed mustard cultivation. Less percentage of respondents had knowledge about seed treatment, insecticides to be used against insects attacking rapeseed mustard crop. ANOVA results revealed that there was significant difference in knowledge level of mustard growers belonging to districts falling under sub-tropical zone as compared to temperate zone so field extension functionaries should pay special attention in hilly area by organizing more awareness programme so that knowledge about different cultivation practices about rapeseed mustard crop may be enhanced. Because better knowledge about agricultural technology leads to good adoption at field level and good adoption leads to improved productivity.

Paper received on : *December 29, 2017*
Accepted on : *January 27, 2018*

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