

## KNOWLEDGE LEVEL OF CRISIS MANAGEMENT PRACTICES BY THE CUMIN GROWERS

K. N. Raval<sup>1</sup>, J. K. Patel<sup>2</sup> and A. B. Dhola<sup>3</sup>

1 & 3 Ph.D Scholar, Dept. of Agril. Ext. and Communication, C.P. College of Agriculture, SDAU, Sardarkrushinagar-385506

2 Assistant Professor and Head, Dept. of Social Science, College of Horticulture, S.D.A.U, Jagudan - 382710

Email : pateljashvant080@gmail.com

### ABSTRACT

*The uncertainty in production of cumin crop causes wide variation in the income of cumin growing farmers from year to year. Thus, production and income uncertainty due to the crisis involved in cumin crop create serious consequences on the income and future production planning of the crop. The present study was confined to "ex-post-facto" research design. The multistage sampling technique was used for selection of respondents. From each of three selected district viz.; Banaskantha, Patan and Kutch of North-West Agro-Climatic Zone two talukas having highest cumin area and production were selected. Three villages from each taluka and from each village, fifteen cumin growers were selected randomly. Thus, total 270 cumin growers were selected for the study. The result of the study revealed that nearly two-thirds (65.92%) of the cumin growers had medium level of knowledge about crisis management practices. Whereas, in case of practices wise knowledge regarding crisis management in cumin; majority of the cumin growers had knowledge about seed is safe from spuriousness and adulteration, to be safe from soil erosion, timely sowing of cumin in first week of November at 30°C, timely application of fertilizers, to postpone the irrigation during cloudy weather, unseasonal rainfall or when the sign of diseases appear, different control measures other than chemical control for disease management, remove weeds by hand weeding and harvest crop when seed attain grey colour to maintain volatile oil and shattering effect.*

**Keywords:** knowledge, crises management, cumin growers, water management, yield

### INTRODUCTION

Cumin is important cash crop. However, its production is most uncertain and fluctuates violently from year to year due to various crisis like the extreme variations in the climatic conditions, occurrence of number of disease mainly powdery mildew, blight and wilt as well as man-made factors. The uncertainty in production of this crop causes wide variation in the income of cumin growing farmers from year to year. Thus, production and income uncertainty due to the crisis involved in cumin crop create serious consequences on the income and future production planning of the crop. Systematic knowledge, planning and adoption of some of the important crisis management practices can help farmers to find out suitable ways to survive during crisis situations in farming (Vinaya et al., 2015). The crisis management in farming is activities or practices adopted by the farmers to stand against the crisis induced by concentrated period of natural calamities, whether and other man created factors. The low level of knowledge and adoption of crisis management practices in cumin can be resulted in low production.

### OBJECTIVES

(1) To measure the knowledge of crisis management practices of the cumin growers

(2) To ascertain relationship between profile of cumin growers and their knowledge of crisis management practices

### METHODOLOGY

The present study was confined to "Ex-post-facto" research design and multistage sampling technique was used for select a representative sample of respondents for present investigation. The study was undertaken in Banaskantha, Patan and Kutch districts which comes under North-West Agro-Climatic Zone as well as in jurisdiction of Sardarkrushinagar Dantiwada Agricultural University. From each selected district two talukas were purposively selected for study based on highest area and production of cumin. Hence, total six talukas were selected. From each selected taluka, five villages and from each village fifteen cumin growers were selected randomly. Thus, total 270 cumin growers were selected as sample size.

To measure the knowledge level of the cumin growers, a battery of the questions concerning cumin crisis management practices was prepared. Each correct answer was given one score and zero to incorrect answer. The

possible total score of a cumin grower could be obtain from the range of 0 to 47score. The score on each item was then added to arrive at total knowledge score of the individual cumin grower. The knowledge index was calculated, The respondents based on their knowledge score were then grouped into three categories viz; Low, Medium and High using mean and standard deviation. Further, the practice-wise level of knowledge about crisis management practice among the cumin growers was calculated. The practices-wise knowledge index was calculated and on the basis of these mean score, per cent was assigned. Correlation coefficient was calculated to find out the association between each of the independent variables with dependent variables. Multiple regression analysis was done to know the combined effect of all independent variables in explaining the variation to the dependent variable. The stepwise regression (multiple regressions) analysis was employed to predict the contribution of independent variables to dependent variable. The correlation coefficient, Multiple regression analysis and Step wise regression analysis was calculated by using formula.

**RESULTS AND DISCUSSION**

**(A) Knowledge level of the crisis management practices by the cumin growers**

Knowledge is the cognitive behavior of an individual. The body of knowledge is the product of learning process. Once the knowledge is acquired, it produces change in the thinking process of an individual which would lead to further change in attitude and helps in making decision in adoption of any technologies. Keeping this in view, attempt has been made to study the level of knowledge of the cumin growers about the crisis management practices. The data regarding knowledge level of the cumin are presented in Table.1

**(1) Knowledge about seed and soil testing related crisis management practices**

**Table 2: Knowledge of cumin growers about seed and soil testing related crisis management practices (n=270)**

Sr. No.	Practices	Maximum score	Obtained score	Per cent
<b>I</b>	<b>Seed</b>			
1	Safe from spurious and adulterated seeds	270	250	92.59
2	Should purchase seed of Government or standard companies from reliable seed traders	270	227	84.07
3	Wilt resistant varieties	270	217	80.37
<b>II</b>	<b>Soil testing</b>			
4	Soil testing report for nutrient management of crop	270	195	72.22

**Table 1: Distribution of the cumin growers according to their knowledge about crisis management practices (n=270)**

Sr. No.	Knowledge	Frequency	Per cent
1	<b>Low</b> (Up to 26.72 score)	47	17.41
2	<b>Medium</b> (26.72 to 37.64 score)	178	65.92
3	<b>High</b> (37.64 and above score)	45	16.67

Mean = 32.18 S.D. = 5.46

It is evident from the Table 5.15 that nearly two-thirds (65.92%) of the cumin growers had medium level of knowledge about crisis management practices followed by 17.41 per cent had low and 16.67 per cent had high level of knowledge about crisis management practices.

From the above, it can be concluded that the majority (83.33%) of the cumin growers had medium to low level of knowledge. The probable reason behind that as the cumin is very risky crop the farmers had tried to gather knowledge through participation in various extension activities and using various kind of source of information as well as had moderate level of farming experience of cumin cultivation.

This finding is in line with the finding of Gohil (2010), Patel *et al.* (2016), Jadeja (2017) Prajapati *et al.* (2020), Tavethiya *et al.* (2021) and Chigadolli *et al.* (2022).

**(B) Practices-wise knowledge of cumin growers about crisis management in cumin crop**

The practice wise knowledge of the cumin growers about crisis management in cumin is discussed in this part.

The results presented in Table 2 regarding knowledge of cumin growers about seed related crisis management practices reveal that majority (92.59%) of the cumin growers had aware about to be safe from spurious and adulterated seed followed by should purchase seed from Government or standard companies from reliable seed traders (84.07%)

### (2) Knowledge about soil preparation related crisis management practices

**Table 3: Knowledge of cumin growers about soil preparation related crisis management practices** (n=270)

Sr. No.	Soil preparation practices	Maximum score	Obtained score	Per cent
1	Deep ploughing before sowing	270	249	92.22
2	Safe from soil erosion	270	265	98.14
3	Prepare small bed for irrigation to escape wilt and blight	270	246	91.11

The result exposed in Table 3 about soil preparation related crisis management practices reflect that vast majority (98.14%) of the cumin growers had knowledge about to safe from soil erosion, while 92.22 per cent of them had

and about wilt resistance varieties (80.37%), whereas, in case of soil testing, nearly three-fourths (72.22%) of the cumin growers had knowledge regards soil testing report for nutrient management of crop.

knowledge about deep ploughing before sowing and 91.11 per cent of them had knowledge regarding to prepare small bed for irrigation to escape wilt and blight.

### (3). Knowledge about sowing related crisis management practices

**Table 4: Knowledge of cumin growers about sowing related crisis management practices** (n=270)

Sr. No.	Sowing Practices	Maximum score	Obtained score	Per cent
1	Timely sowing of cumin in first week of November at 30°C	270	245	90.74
2	Cumin crop should not grow around high water demanding crop viz; wheat, castor, mustard and alfalfa	270	80	29.62
3	Proper depth of sowing	270	234	86.66
4	Appropriate distance between two lines	270	83	30.74
5	Recommended seed rate	270	187	69.25
6	Seed treatment as per recommendation	540	190	35.18

In case of sowing related crisis management practices as presented in Table 4, majority (90.74%) cumin growers had knowledge about timely sowing of cumin in first week of November at 30°C followed by proper depth of sowing (86.66%) and about recommended seed rate (69.25%).

Further, more than one-thirds (35.18%) of the cumin growers had knowledge about recommended seed treatment, 30.74 per cent had knowledge about appropriate distance between two lines and 29.62 per cent had knowledge about to cumin crop should not grow around the high water demanding crops viz.; wheat, castor, mustard and alfalfa.

### (4) Knowledge about fertilizer management related crisis management practices

**Table 5: Knowledge of cumin growers about fertilizer management related crisis management practices**

(n=270)

Sr. No.	Fertilizer management Practices	Maximum score	Obtained score	Per cent
1	Recommended dose of fertilizers	270	119	44.07
2	Timely application of fertilizers	270	247	91.48
3	Application of split nitrogenous fertilizers during proper moist condition in soil after irrigation	270	124	45.92
4	Recommended dose of micro-nutrients	270	119	44.07

It is apparent from Table 5 showed that the majority (91.48%) of cumin growers had knowledge about timely application of fertilizers, while 45.92 per cent of them had knowledge about application of split nitrogenous fertilizers during proper moist condition in soil after irrigation. Whereas, equal per cent (44.07%) of them had knowledge about recommended dose of fertilizers and micro-nutrients.

**(5) Knowledge about water management related crisis management practices**

**Table 6: Knowledge of cumin growers about water management related crisis management practices (n=270)**

Sr. No.	Water management practices	Maximum score	Obtained score	Per cent
1	Recommended irrigation at critical stages of crop	270	233	86.29
2	Supply irrigation at 10 DAS for better germination	270	218	80.70
3	To postpone the irrigation during cloudy weather, unseasonal rainfall or when the sign of diseases appear	270	264	97.77

The data in the Table 6 reveal that vast majority (97.77%) of the cumin growers had knowledge about to postpone the irrigation during cloudy weather, unseasonal rainfall or when the sign of diseases appear followed by recommended irrigation at critical stages of crop (86.29%) and supply irrigation at 10 DAS for better germination (80.70%).

**(6) Knowledge about inter culturing and crop rotation related crisis management practices**

**Table 7 : Knowledge of cumin growers about inter culturing and crop rotation related crisis management practices (n=270)**

Sr. No.	Practices	Maximum score	Obtained score	Per cent
<b>I</b>	<b>Inter culturing</b>			
1	Inter culturing followed by the third, fourth and fifth irrigations for cumin blight	270	68	25.18
<b>II</b>	<b>Crop rotation</b>			
2	Cumin crop should grow after <i>kharif</i> crops like groundnut, maize, sesamum, mungbeen, blackgram and fodder sorghum for soil and disease management, higher seed yield and nitrogen savings	270	109	40.37

The data presented in Table 7 revealed that one-fourth (25.18%) of cumin growers had knowledge about inter culturing followed by the third, fourth and fifth irrigations for cumin blight. While, two-fifths (40.37%) of cumin growers had knowledge about cumin crop should grow after *kharif* crops like groundnut, maize, sesamum, mungbeen, blackgram and fodder sorghum for soil and disease management, higher seed yield and nitrogen savings.

**(7) Knowledge about plant protection related crisis management practices**

**Table 8: Knowledge of cumin growers about plant protection related crisis management practices (n=270)**

Sr. No.	Plant protection Practices	Maximum score	Obtained score	Per cent
1	Different control measures other than chemical control for sucking pests like aphid, thrips	270	188	69.62
2	Recommended insecticides with proper dose	1080	543	50.27
3	Larval infestation control measures	270	130	48.14
4	Different control measures other than chemical control for disease management	270	221	81.85
5	Spray of mancozeb at 10 days of interval after 35-40 days of sowing for cumin blight	540	315	58.33
6	Application of the sulphur dust 300 mesh in the morning for powdery mildew	540	338	62.59
7	Method of application of pesticides/fungicides	270	211	78.14
8	Timely application of pesticides/fungicides	270	194	71.85

In case of plant protection related crisis management practices as presented in Table 8, majority (81.85%) of the cumin growers had knowledge about different control measures other than chemical control for disease management followed by method of application of pesticides/fungicide (78.14%), timely application of pesticides/fungicides (71.85%) and different control measures other than chemical control for sucking pests like aphid, thrips (69.62%)

Further, more than two-fifths (62.59%) of cumin growers had knowledge about application of the sulphur dust 300 mesh in the morning for powdery mildew followed by spray of mancozeb at 10 days of interval after 35-40 days of sowing for cumin blight (58.33%) and about recommended insecticides with proper dose (50.27%). Only 48.14 per cent of the cumin growers had knowledge about larval infestation control measures.

#### (8) Knowledge about weed management related crisis management practices

**Table 9: Knowledge of cumin growers about weed management related crisis management practices**

(n=270)

Sr. No.	Weed management practices	Maximum score	Obtained score	Per cent
1	Remove weeds by hand weeding	270	262	97.03
2	Maintain the field free from the weed at least 45 days from sowing for good growth	270	240	88.88
3	Recommended herbicides with proper dose	540	293	54.26
4	Proper method of application of herbicide	270	221	81.85
5	Proper time of herbicide use	270	221	81.85

It is apparent from Table 9 that the vast majority (97.03%) of cumin growers had knowledge about to remove weeds by hand weeding, while 88.88 per cent of the cumin growers had knowledge about to maintain the field free from the weed at least 45 days from sowing for good growth. Equal

per cent (81.85%) of the cumin growers had knowledge about use of herbicide with proper method of application and proper time followed by recommended herbicides with proper dose (54.26%).

#### (9) Knowledge about harvesting and storage related crisis management practices

**Table 10: Knowledge of cumin growers about harvesting and storage related crisis management practices**

(n=270)

Sr. No.	Harvesting and storage practices	Maximum score	Obtained score	Per cent
1	Harvest cumin crop when seed attain grey colour for maintain volatile oil and shattering effect	270	260	96.29
2	Harvesting should be done during morning hours	270	200	74.07
3	Proper method of post-harvest management	270	207	76.66
4	Dry the seeds up to 10 percent of moisture for storage	270	226	83.70
5	Proper protection measures in storage	270	250	92.59

The data in the Table 10 reveal that vast majority (96.29%) of the cumin growers had knowledge related to harvest cumin crop when seed attain grey colour for maintain volatile oil and shattering effect followed by knowledge about proper protection measures in storage (92.59%), dry the seeds up to 10 percent moisture for storage (83.70%), about proper method of post-harvest management (76.66%) and harvesting should be done during morning hours (74.07%).

land holding, annual income, extension participation, source of information, management orientation, risk orientation, innovativeness, cropping intensity, cropping pattern and source of irrigation were used to know association with the knowledge of cumin growers about crisis management practices. A statistical method of Karl Pearson's coefficient correlation (r) was used to calculate this. The result obtained is dispensed in Table 10

#### (C) Relationship between the profile of cumin growers and their knowledge of crisis management practices

Total 13 variables viz., age, education, farming experience,

It can be concluded from Table.10 shows that among the personal, socio-economic, communicational, psychological and situational variables, the variables viz., education, extension participation, source of information,

**Table 10: Relationship between the profile of cumin growers and their knowledge about crisis management practices (n = 270)**

Sr. No.	Characteristics	Coefficient of correlation (r)
X <sub>1</sub>	Age	-0.119 <sup>NS</sup>
X <sub>2</sub>	Education	0.309**
X <sub>3</sub>	Farming experience	0.097 <sup>NS</sup>
X <sub>4</sub>	Land holding	0.021 <sup>NS</sup>
X <sub>5</sub>	Annual income	0.035 <sup>NS</sup>
X <sub>6</sub>	Extension participation	0.585**
X <sub>7</sub>	Source of information	0.544**
X <sub>8</sub>	Management orientation	0.499**
X <sub>9</sub>	Risk orientation	0.186**
X <sub>10</sub>	Innovativeness	0.342**
X <sub>11</sub>	Cropping intensity	0.148*
X <sub>12</sub>	Cropping pattern	0.149*
X <sub>13</sub>	Source of irrigation	0.024 <sup>NS</sup>

\* Significant at 0.05 level of probability

\*\* Significant at 0.01 level of probability

management orientation, risk orientation and innovativeness had exerted positive and highly significant relationship with knowledge about crisis management practices, while cropping pattern and cropping intensity had positive and significant relationship. Whereas, age, farming experience, land holding, annual income and source of irrigation exerted non-significant relationship with knowledge about crisis management practices.

**(i) The extent of variation caused by independent variables on the knowledge**

The multiple regression analysis was performed

**Table 11: Multiple regression analysis of the selected independent variables with knowledge of cumin growers about crisis management practices (n=270)**

Sr. No.	Independent variables	Regression coefficient (b)	't' value	Significance
1	a (Constant)	14.410	6.007	0.000
2	X <sub>1</sub> (Age)	-0.040	-1.633	0.104
3	X <sub>2</sub> (Education)	0.095	0.392	0.695
4	X <sub>3</sub> (Farming experience)	0.052	1.071	0.285
5	X <sub>4</sub> (Land holding)	-0.021	-0.850	0.396
6	X <sub>5</sub> (Annual income)	0.495	1.790	0.075
7	X <sub>6</sub> (Extension participation)	0.327**	4.840	0.000
8	X <sub>7</sub> (Source of information)	0.133*	2.433	0.016
9	X <sub>8</sub> (Management orientation)	0.139**	4.676	0.000
10	X <sub>9</sub> (Risk orientation)	-0.197**	-3.335	0.001
11	X <sub>10</sub> (Innovativeness)	0.217	0.812	0.418
12	X <sub>11</sub> (Cropping intensity)	0.003	0.266	0.791
13	X <sub>12</sub> (Cropping pattern)	1.695	1.759	0.080
14	X <sub>13</sub> (Source of irrigation)	0.035	0.315	0.753

Multiple R = 0.689

R<sup>2</sup> = 0.475

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

to study the extent of variation on knowledge by different independent variables towards crisis management practice. It was carried out to know the important variables with their predicting ability in explaining the variation in knowledge of the cumin growers. In multiple regression analysis, thirteen independent variables were fitted to explain the variation in knowledge of the cumin growers.

These variables were used for multiple regression analysis using following multiple regression models.

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9 + b_{10} X_{10} + b_{11} X_{11} + b_{12} X_{12} + b_{13} X_{13} + e_i$$

Where,

Y=Knowledge

a=intercept value

b<sub>1</sub>=partial regression coefficient of Y on X<sub>1</sub>

b<sub>2</sub>=partial regression coefficient of Y on X<sub>2</sub>

b<sub>3</sub>=partial regression coefficient of Y on X<sub>3</sub>

b<sub>4</sub>=partial regression coefficient of Y on X<sub>4</sub>

b<sub>5</sub>=partial regression coefficient of Y on X<sub>5</sub>

b<sub>6</sub>=partial regression coefficient of Y on X<sub>6</sub>

b<sub>7</sub>=partial regression coefficient of Y on X<sub>7</sub>

b<sub>8</sub>=partial regression coefficient of Y on X<sub>8</sub>

b<sub>9</sub>=partial regression coefficient of Y on X<sub>9</sub>

b<sub>10</sub>=partial regression coefficient of Y on X<sub>10</sub>

b<sub>11</sub>=partial regression coefficient of Y on X<sub>11</sub>

b<sub>12</sub>=partial regression coefficient of Y on X<sub>12</sub>

b<sub>13</sub>=partial regression coefficient of Y on X<sub>13</sub>

e<sub>i</sub>=error

It is concluded from the Table 5.36 that 47.50 per cent of the total variation in the level of knowledge was explained through the variables considered as the regression equation. The unexplained variation was 52.50 per cent, which may be due to extraneous factors.

The calculated 't' values of the partial regression coefficient were significant in case of extension participation ( $X_6$ ), source of information ( $X_7$ ), management orientation ( $X_8$ ) and risk orientation ( $X_9$ ).

From the regression analysis, it was concluded that out of thirteen variables, four variables viz., extension participation, source of information, management orientation and risk orientation had significant effect on the knowledge level of the cumin growers. Regression coefficient indicated that one-unit change in extension participation, source of information, management orientation and risk orientation would affect 0.327 units, 0.133 units, 0.139 units and -0.197 units change in the knowledge of the cumin growers.

#### (ii) Relative importance of independent variables in explaining knowledge

In the previous sub-section, the relationship between independent and dependent variable was expressed in terms of correlation coefficient ('r') derived. However, generally in behavioural sciences no dependent variable can be influenced singly by one independent variable. As such the knowledge is in reality not influenced by any of the independent variable singly. It is found to be influenced by the independent attributes jointly through their reciprocal and interactive relationship. In order to assess the contribution (influence)

of each independent variable to the dependent variable, the effect of other was held constant. The stepwise regression is one such method which has been widely adopted in multiple regression analysis. It has got the added advantage that at each stage of analysis every variable is subjected to an examination as its predictive value.

The variables were introduced step-wise in succession depending upon the contribution of each of the independent variables in explaining the variation in the dependent variable. The multiple regressions coefficient (R) represent the correlation between the dependent variable's actual score and the predicted score obtained from the multiple regression equation. The coefficient of multiple determinations ( $R^2$ ) gives the average amount of change in dependent variable when all independent variables were taken together and were tested with 'F' test as their significance. Partial regression coefficient (b) represent the change in dependent variable as a unit change in independent variable and it was tested with 't' test for its significance.

The various independent variables had their own units of measurement which did not permit a comparison of the partial 'b' values. To facilitate the comparison, the partial 'b' values were converted into standard partial 'b' values which were free from the units of measurements. The independent variables were then ranked on the basis of standard partial 'b' values to find out their relative importance in predicting the dependent variable. The independent variables were then ranked based on standard partial regression coefficient values (b) which are presented in Table 12.

**Table 12: Step-wise multiple regression analysis of the selected independent variables with knowledge of cumin growers about crisis management practices** (n=270)

Sr. No.	Independent variables	Partial regression coefficient (b)	Standard Error	Standardized partial regression coefficient (SPRC)	Rank
1	$X_6$	0.337	0.067	0.355	I
2	$X_8$	0.157	0.027	0.326	II
3	$X_9$	-0.211	0.057	-0.196	V
4	$X_7$	0.148	0.054	0.191	III
5	$X_{12}$	1.365	0.497	0.126	IV

$X_6$  = Extension participation,  $X_7$  = Source of information,  $X_8$  = Management orientation,  $X_9$  = Risk orientation,  $X_{12}$  = Cropping pattern.

From the Table 5.37, it can be observed that out of thirteen independent variables, five variables were acquainting influence on knowledge. All the independent variables together were contributing 47.50 per cent variation as indicated by  $R^2$  value.

According to standard partial 'b' values, ranks were assigned to variables. Thus, first rank was assigned to extension participation ( $X_6$ ) followed by management orientation ( $X_8$ ), source of information ( $X_7$ ), cropping pattern ( $X_{12}$ ) and risk orientation ( $X_9$ ) with Standard Partial Regression

Coefficient (SPRC) 0.355, 0.326, 0.191, 0.125 and -0.196.

It is clear from the Table 13 that six variables viz., extension participation, management orientation, risk orientation, source of information and cropping pattern

put together explained as much as 45.60 per cent of total variation in knowledge level of cumin growers about crisis management practices. The unexplained variation was 54.40 per cent, which might be due to factors other than those not include in the study.

**Table 13: Step-wise variation accounted by selected independent variables in knowledge of cumin growers about crisis management practices (n=270)**

Model No.	Independent variable	Multiple 'R'	Total variation accounted 'R <sup>2</sup> '	Variation between step
1	X <sub>6</sub>	0.585	0.342 (34.20%)	34.20
2	X <sub>6</sub> + X <sub>8</sub>	0.632	0.400 (40.00%)	5.80
3	X <sub>6</sub> + X <sub>8</sub> + X <sub>9</sub>	0.651	0.424 (42.40%)	2.40
4	X <sub>6</sub> + X <sub>8</sub> + X <sub>9</sub> + X <sub>7</sub>	0.664	0.441 (44.10%)	1.70
5	X <sub>6</sub> + X <sub>8</sub> + X <sub>9</sub> + X <sub>7</sub> + X <sub>12</sub>	0.675	0.456 (45.60%)	1.50
<b>Total</b>				<b>45.60</b>

X<sub>6</sub>= Extension participation, X<sub>8</sub>=Management orientation, X<sub>9</sub>=Risk orientation, X<sub>7</sub>=Source of information, X<sub>12</sub>=Cropping pattern

It is clear from Table 13 that the variable extension participation alone accounted 34.20 per cent variation in knowledge level of cumin growers about crisis management practices., followed by extension participation + management orientation (5.80%), extension participation + management orientation + risk orientation (2.40%), extension participation + management orientation + risk orientation + source of information (1.70%) and extension participation + management orientation + risk orientation + source of information + cropping pattern (1.50%).

It can be concluded from the above result of stepwise regression analysis that 45.60 per cent of variation was accounted by extension participation, management orientation, risk orientation, source of information and cropping pattern put together in forming the knowledge of cumin growers about crisis management practices.

**CONCLUSION**

It can be concluded that nearly two-thirds (65.92%) of the cumin growers had medium level of knowledge about crisis management practices followed by 17.41 per cent had low and 16.67 per cent had high level of knowledge about crisis management practices.

Whereas, in case of practices wise knowledge regarding crisis management in cumin; majority of the cumin growers had knowledge about seed is safe from spuriousness and adulteration, to be safe from soil erosion,

timely sowing of cumin in first week of November at 30°C, timely application of fertilizers, to postpone the irrigation during cloudy weather, unseasonal rainfall or when the sign of diseases appear, different control measures other than chemical control for disease management, remove weeds by hand weeding and harvest crop when seed attain grey colour to maintain volatile oil and shattering effect.

Among the personal, socio-economic, communicational, psychological and situational variables, the variables viz., education, extension participation, source of information, management orientation, risk orientation and innovativeness had exerted positive and highly significant relationship with knowledge about crisis management practices, while cropping pattern and cropping intensity had positive and significant relationship. Whereas, age, farming experience, land holding, annual income and source of irrigation exerted non-significant relationship with knowledge about crisis management practices.

**CONFLICT OF INTEREST**

All authors declare that they have no conflict of interest

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