



KNOWLEDGE AND ADOPTION OF MANAGEMENT PRACTICES OF PREVALENT INSECTS OF GROUNDNUT CROP

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Abstract

This study has sought to ascertain respondent's level of knowledge and adoption of management practices of prevalent insects in groundnut crop based on sample of 160 farmer respondents from Raigarh district of Chhattisgarh State during the year 2014-15. The study observed that majority of the respondents (67.50%) had medium level of knowledge regarding management practices of insects of groundnut crop. The study reported that majority of the respondents (71.25%) had medium level extent of adoption regarding management practices of insects in groundnut crop *i.e.* cultural practices, crop rotation or mix cropping, seed treatment, soil treatment, mechanical practices, light trap or pheromone trap, use of insecticides and precautions during use of insecticides. From the results of correlation and multiple regression analysis, it can be concluded that if the level of knowledge of respondents regarding management practices of prevalent insects of groundnut crop is expanded, the extent of adoption will be increased.

Key words : Knowledge, adoption, correlation and multiple regressions.

Introduction

Groundnut (*Arachis hypogaea* L.) also known as peanut is a legume that ranks 6th among the oilseed crops and 13th among the food crops of the world. It is the most important oilseed crop in India, covering nearly half of the area under oilseeds. In Chhattisgarh, 2,69,979 hectare area comes under oil seeds crops with production is 14,996 MT. (Directorate, Land Record, Raipur C.G. 2013-14).

Out of total oil seeds crops groundnut covers an area around 29,397 hectare with the production of 40,504 MT, among the all districts of Chhattisgarh State, Raigarh district is higher in both area and production which covers an area 7,572 hectare and production 9,930 MT (Directorate, Land Record, Raipur C.G. 2013-14).

Groundnut crop suffers by number of insects and pests are the major reasons for lower productivity. However, it is managed by adopting measures like, use of resistant cultivars, cultural, mechanical, biological and chemical. The crop is infested with sucking type of insects like aphids, leaf minor, thrips, leaf eating caterpillars in the initial and active growth stages. In the later stages,

the crop may be attacked by groundnut white grub which punctures the developing pods causing heavy damage.

It is necessary to assess the level of knowledge and adoption the management practices of prevalent insects of groundnut crops. Therefore, the present study was undertaken with the following specific objectives:

1. To study the knowledge level of the groundnut growers regarding management practices of the prevalent insects.
2. To study the extent of adoption regarding management practices of prevalent insects of groundnut crop.

Methodology

For studying level of knowledge and adoption level, a standardized scale was developed by the investigator and used to collect the data for some major management practices *viz.* cultural practices, resistance varieties, crop rotation or mix cropping, mechanical practices, light trap or pheromone trap, biological practices, use of predator insects, soil treatment, seed treatment, use of insecticide, precaution during use of insecticide.

The knowledge test composed of items called

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questions covering various aspects of management practices of prevalent insects of groundnut crop. The important practices were listed and responses for each practice were obtained into three point scale as under low knowledge, partially knowledge and fully knowledge obtainable score 1, 2 and 3 respectively. The farmer's knowledge level was ascertained in terms of selected practices of management of insects of groundnut crop. The total 58 questions were finalized. The knowledge index was worked out as follows:

$$\text{Knowledge Index} = \frac{\text{Sum of knowledge score actually obtained by the respondent}}{\text{Maximum possible obtainable knowledge score by the respondent}} \times 100$$

Further, the respondents were classified into three categories by using following formula:

$$\text{K.I.} = \text{Mean } (\bar{X}) \pm \text{S.D. (Standard Deviation)}$$

S.no.	Categories	
1.	Low level of knowledge	($< \bar{X} - \text{S.D.}$)
2.	Medium level of knowledge	(in between $\bar{X} \pm \text{S.D.}$)
3.	High level of knowledge	($> \bar{X} + \text{S.D.}$)

To measures the extent of adoption of management practices of prevalent insects of groundnut crop. The important practices were listed and responses for each practice were obtained into three point scale as under not adopted, partially adopted and fully adopted obtainable score 1, 2 and 3 respectively. The farmer's extent of adoption was ascertained in terms of selected practices of management of insects of groundnut crop adopted. The total 40 questions were finalized. The adoption index was worked out as follows:

$$\text{Adoption index} = \frac{\text{Sum of adoption score actually obtained by the respondents}}{\text{Maximum possible obtainable adoption score by the respondents}} \times 100$$

The respondents were classified into three categories by using following formula:

$$\text{A.I.} = \text{Mean } (\bar{X}) \pm \text{S.D. (Standard Deviation)}$$

S.no.	Categories	
1.	Low level of adoption	($< \bar{X} - \text{S.D.}$)
2.	Medium level of adoption	(in between $\bar{X} \pm \text{S.D.}$)
3.	High level of adoption	($> \bar{X} + \text{S.D.}$)

Results and Discussion

Knowledge level of the respondents regarding management practices of insects of groundnut crop

From the table 1, it is observed that majority of the respondents (67.50%) had medium level of knowledge regarding management practices of insects of groundnut crop, followed by 17.50 per cent of the respondents, who had high level of knowledge whereas 15.00 per cent of the respondents with low level of knowledge regarding management practices of insects of groundnut crop.

Table 1 : Distribution of respondents according to overall level of knowledge regarding management practice of insects of groundnut crop.

(n=160)

S.no.	Level of knowledge	Frequency	Per cent
1	Low (up to 58 %)	24	15.00
2	Medium (59 -75 %)	108	67.50
3	High (76% and above)	28	17.50
	Total	160	100.00

$$\bar{X} = 66.67$$

$$\text{S.D.} = 8.57$$

Level of knowledge of different components of management practices of insects in groundnut crop

Table 2 : Distribution of respondents according to practice wise level of knowledge regarding management of insects of groundnut crop.

(n= 160)

S. no.	Management practices	Level of knowledge		
		Low (%)	Partial (%)	Fully (%)
1.	Identification of insects	00.00	80.63	19.37
2.	Nature of damage of insects	00.00	70.63	29.37
3.	Cultural practices	00.00	46.87	53.13
4.	Resistant varieties	91.25	8.75	00.00
5.	Crop rotation or mix cropping	10.00	84.37	5.63
6.	Mechanical practices	6.87	88.13	5.00
7.	Light trap or pheromone trap	17.50	55.00	27.50
8.	Biological practices	23.13	70.00	6.87
9.	Use of predator insects	85.63	14.37	00.00
10.	Soil treatment	33.00	61.87	3.13
11.	Seed treatment	1.25	83.13	15.62
12.	Insecticide	00.00	73.13	26.87
13.	Precaution during use of insecticide	00.00	40.00	60.00

(%) (Per cent)

The data presented in table 2 reveals that the respondents had low knowledge regarding management practices of insects of groundnut crop *i.e.* resistant varieties (91.25%), use of predator insects (85.63%), soil treatment (33.00%), biological practices (23.13%), light trap or pheromone trap (17.50%), crop rotation or mix cropping (10.00%), mechanical practice (6.87%), seed treatment (1.25%) whereas the respondents, who had partial knowledge regarding management practices of insects of groundnut crop *i.e.* identification of insects (80.63%), nature of damage of insects (70.63%), mechanical practices (88.13%), crop rotation or mix cropping (84.37%), seed treatment (83.13%), use of insecticides (73.13%), biological practices (70.00%), soil treatment (61.87%), light trap or pheromone trap (55.00%), cultural practices (46.87%), precautions during use of insecticides (40.00%), use of predator insects (14.37%) and resistant varieties (8.75%).

While in case of fully knowledge group selected practices are precautions during use of insecticides (60.00%), cultural practices (53.13%), nature of damage of insects (29.37%), light trap or pheromone trap (27.50%), use of insecticides (26.87%), identification of insects (19.37%), seed treatment (15.62%), biological practices (6.87%), crop rotation or mix cropping (5.63%), mechanical practices (5.00%), soil treatment (3.13%).

Adoption level regarding management practices of insects in groundnut crop

Table 3 : Distribution of respondents according to overall extent of adoption regarding management practices of insects of groundnut crop.

S. no.	Adoption	Frequency	Per cent
1	Low (up to 45%)	24	15.00
2	Medium (46% - 54%)	114	71.25
3	High (55% and above)	22	13.75
	Total	160	100.00

(n= 160)

\bar{X} =49.82

S.D.=4.37

The data presented in table 3, it is observed that majority of the respondents (71.25%) had medium category of adoption regarding management practices of insects in groundnut crop, followed by 15.00 per cent of the respondents had low adoption category whereas 13.75 per cent of the respondents had high adoption category regarding management practices of insects of groundnut crop.

Extent of adoption of different components of management practices of insects in groundnut crop

The data presented in table 4 reveals that the respondents had no adoption regarding management practices of insects of groundnut crop *i.e.* light trap or pheromone trap (97.50%), Soil treatment (91.25%), mechanical practices (53.75%), seed treatment (30.63%), crop rotation or mix cropping (20.00%), use of insecticides (0.63%) and cent per cent respondents on adoption regarding resistant varieties, biological practices, use of predator insects, and none of the respondents had no adoption category regarding cultural practices and precaution during use of insecticide, Sharma and Sharma (2006) also reported negligible adoption of plant protection measures. whereas the respondents who had partial adoption regarding management practices of insects of groundnut crop *i.e.* cultural practices (95.00%), use of Insecticides (92.50%), crop rotation or mix cropping (79.37%), precautions during use of insecticides (73.75%), seed treatment (69.37%), mechanical practices (46.25%), soil treatment (8.75%), light trap or pheromone trap (02.50%) and none of the respondents had partial adoption category regarding biological practices, use of predator insects and resistant varieties. Sharma *et al.*(2013) revels that majority of respondents had low adoption of “seed treatment”, “pest management”, “soil treatment” and “disease management”.

Table 4 : Distribution of respondents according to practice wise extent of adoption regarding management of insects of groundnut crop.

(n= 160)

S. no.	Management practices	Extent of Adoption		
		Nil (%)	Partial (%)	Fully (%)
1.	Cultural practices	00.00	95.00	5.00
2.	Resistance varieties	100.00	00.00	00.00
3.	Crop rotation or mix cropping	20.00	79.37	0.63
4.	Mechanical practices	53.75	46.25	00.00
5.	Light trap or pheromone trap	97.50	2.50	00.00
6.	Biological practices	100.00	00.00	00.00
7.	Use of predator insects	100.00	00.00	00.00
8.	Soil treatment	91.25	08.75	00.00
9.	Seed treatment	30.63	69.37	00.00
10.	Use of Insecticide	0.63	92.50	6.87
11.	Precaution during use of insecticide	00.00	73.75	26.25

While in case of complete adoption group regarding precautions during use of insecticides (26.25%), cultural practices (05.00%), use of insecticides (06.87%), crop rotation or mix cropping (0.63%) and none of the respondents had complete adoption regarding resistant varieties, mechanical practices, biological practices, soil treatment, light trap or pheromone trap, seed treatment, and use of predator insects.

Correlation analysis of independent variables with level of knowledge of management practices of prevalent insects of groundnut crop

Table 5 : Correlation analysis of independent variables with level of knowledge of management practices of prevalent insects of groundnut crop.

S. no.	Independent variables	Coefficient of correlation "r" value
1.	Education	0.446**
2.	Size of family	0.007
3.	Social participation	0.289**
4.	Land Holding	0.289**
5.	Occupation	-0.123
6.	Annual income	0.129**
7.	Credit acquisition	-0.001
8.	Contact with extension agencies	0.372**
9.	Source of information	0.448**
10.	Scientific orientation	0.492**

** Significant at 0.01 level of probability (0.202).

It is obvious from the data in table 5 that the variables *viz.* education, social participation, land holding, annual income, contact with extension agencies, sources of information and scientific orientation were found positively and significantly related with the knowledge at 0.01 per cent level of significance. Hence, the significant relationship shows that when the level of the above variables *viz.* education, land holding, annual income, contact with extension agencies, sources of information and scientific orientation increases then the level of knowledge of the respondents will also increase. Three variables size of family, occupation and credit acquisition were found to had no relationship with the knowledge.

These findings clearly indicate that most of the selected independent variables were positively and significantly related with the level of knowledge regarding management practices of prevalent insects of groundnut crop.

Multiple regression analysis of independent variables with level of knowledge of management practices of the prevalent insects of groundnut crop

Table 6 : Multiple regression analysis of independent variables with level of knowledge of management practices of the prevalent insects of groundnut crop.

S. no.	Independent variables	Regression Coefficient	
		"b" value	"t" value
1.	Education	2.634**	2.662
2.	Size of family	-0.089	-0.044
3.	Social participation	1.435	0.803
4.	Land Holding	0.705	1.106
5.	Occupation	-0.610	-1.084
6.	Annual income	-0.774	-0.668
7.	Credit acquisition	-1.400	-0.399
8.	Contact with extension agencies	0.797	0.847
9.	Source of information	0.143	0.196
10.	Scientific orientation	1.935**	2.797

**Significant at 0.01 level of probability (2.606) $R^2 = 0.6324$

* Significant at 0.05 level of probability (1.974)

Multiple regression analysis was employed to find out the relative contribution of independent variables towards the level of knowledge. The results of regression analysis are presented in table 6 reveals that the independent variables altogether had 63.24 per cent prediction ability to the knowledge of management practices of the prevalent insects of groundnut crop. It shows that two variables *viz.* education and scientific orientation had significant contribution towards knowledge at 0.01 per cent level of significance. The remaining eight variables *viz.* size of family, social participation, Land Holding, Occupation, Annual income, Credit acquisition, contact with extension agencies and source of information had no significant contribution towards knowledge.

It could further be seen that all the 10 independent variables jointly explained the variation to the extent of 63.24 per cent in level of knowledge of the respondents regarding management practices of prevalent insects of groundnut crop, which was found statistically significant at 0.01 per cent level of significance. It is therefore suggested that if the knowledge of respondents regarding management practices of prevalent insects of groundnut crop to be boosted there is a need to manipulate their level of knowledge through proper guidance and training.

This would be helpful in adoption behavior of respondents regarding management practices of prevalent insects of groundnut crop.

Conclusion

The present study has identified the level of knowledge and adoption of different components of management practices of insects of groundnut crop, It was found that the partial knowledge regarding management practices of insects of groundnut crop *i.e.* identification of insects, nature of damage of insects, mechanical practices, crop rotation or mix cropping, seed treatment, use of insecticides, biological practices, soil treatment, cultural practices, precautions during use of insecticides, use of predator insects and resistant varieties.

It was found that partial extent of adoption regarding management practices of insects of groundnut crop *i.e.* cultural practices, use of Insecticides, crop rotation or mix cropping, precaution during use of insecticides, seed treatment, mechanical practices, soil treatment, light trap or pheromone trap and cent per cent respondents had on adoption regarding resistant varieties, Biological practices, use of predator insects, Extension system should make efforts to educate the farmers on these components, which are very important to affect the management of insects.

From the results of correlation and multiple regression analysis, it can be concluded that if the level of knowledge

of respondents regarding management practices of prevalent insects of groundnut crop is expanded, the extent of adoption will be increased.

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