



Research Article

MULTIVARIATE ANALYSIS OF ECO-FRIENDLY MANAGEMENT PRACTICES BY COTTON GROWERS IN YADGIR DISTRICT OF KARNATAKA

SHASHIDHARA K.K.^{1*} AND VEDAMURTHY K.B.²

¹Department of Agricultural Extension Education, College of Agriculture, Bheemarayangudi, University of Agricultural Sciences, Raichur, 584133, Karnataka, India

²Department of Dairy Economics and Business Management, Dairy Science College, Kalaburgi, Karnataka, India

*Corresponding Author: Email- agrishashi@gmail.com

Received: August 18, 2016; Revised: August 25, 2016; Accepted: August 26, 2016; Published: October 30, 2016

Abstract- The nature friendly management of pest is seen as a wide range natural approach to pest control employing several methods and techniques viz., agronomic practices, using agriculture implements, bio agents and agro chemicals in a compatible manner to keep the pest level below economic threshold. The research was conducted in 2014-15 in Yadgir district of North eastern part of Karnataka. Total 160 cotton-cultivating respondents were selected on proportionate random sample method. The variables such as achievement motivation, innovative proneness, scientific orientation, risk orientation, cosmopolitaness, attitude towards chemical fertilizers, extension participation, institutional participation and mass media use show significant positive relationship with knowledge of management eco-friendly practices by cotton cultivating respondents. Only two characters namely risk orientation and achievement motivation had contributed significantly to the knowledge level of eco-friendly management practices by cotton growers. All the 11 independent variables put together contributed to an extent of 46.40 per cent in explaining variation in knowledge level of eco-friendly management practices by cotton growers. The highest and lowest favourable indirect effect was contributed by the variables economic motivation and education, respectively. Most of the substantial indirect effect was channelized through risk orientation, achievement motivation and mass media use.

Keywords- Eco-friendly, Socio-economic and Knowledge, Cotton

Citation: Shashidhara K.K. and Vadamurthy K.B., (2016) Multivariate Analysis Of Eco-Friendly Management Practices by Cotton Growers in Yadgir District of Karnataka. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 8, Issue 52, pp.-2459-2461.

Copyright: Copyright©2016 Shashidhara K.K. and Vadamurthy K.B., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Dr Chander Shekhar, Dr S. P. Halagalimath

Introduction

The modern farming systems aim at increase the production and productivity by application of external inputs such as fertilizers and plant protection amenities without consideration the their harmful effects. Consequently, the traditional agronomic practices such as growing green manuring crops, use of agriculture wastes as it is or after decomposing and other soil ameliorative measures have not practiced as a part of the farming systems. It indicated slow but steady decline in the productivity of the soil.

Enormous and high quantity of fertilizers application has caused several problems on land as well as on ecosystem. Pest and disease resurgence is more due plants become more susceptible. It could be controlled effectively by using high dose application of chemicals. Due to over dosage application their residues are found in plants and as well as in soil, which creates to health hazards [1]. Similarly, excess application of nitrogenous fertilizers in the form of nitrate and phosphate washed from soil surface and entered into natural ecosystem by polluting the drinking water which leads responsible for health hazards in human beings and as well as in animals. The harmful effects of fertilizers and chemicals on plants are reduction in germination, slow down the seedling growth, burning effect and more susceptible to diseases [2]. Methemoglobinemia (blue baby disease) in infants, cancer and respiratory illness in human beings, eutrophication and plant toxicity due to excessive availability of inorganic and organic nitrogen in surface water and soil [3].

Eco-friendly farming helps to avoid chain reaction in the environment from chemical sprays and dusts, helps to prevent environmental degradation and can be used to generate degraded areas. It improves soil physico-chemical properties, reduces the need for purchase inputs, organically grown crops are believed to

provide more healthy and nutritionally superior food for man and animals and plants are more resistant to pests and diseases than those grown with commercial fertilizers [4]. The important eco-farming management practices are biological farming, nature farming, age old agricultural practices, sustainable agricultural practices, use of bio agents and pharma-culture, all these practices may be considered as eco-friendly farming technologies. United States Department of Agriculture [5] has defined eco-farming (organic farming) as a production system by using appropriate quantity of urea, phosphorus and potash, pesticides, growth promoters and retarders and livestock feed additives.

It rather relies more upon alternate crops year after year, crop wastes management, animal dung, growing legumes and green manure crops every year, agriculture wastes, mechanical cultivation and biological pest management. Considering the recent origin of eco-friendly farming, the importance it has received and the diversified nature of farmers involved in it, this research work was under taken to study the influence of selected characteristics of the cotton growers on their adoption of the eco-friendly practices. In coming years, our goal should be to develop eco-friendly technologies for attaining the production goals while ensuring sustainable use of natural resources and high efficiency of inputs [6].

Indigenous agricultural practices can play a key role in the design of sustainable and eco-friendly agricultural farming methods, enhancing the probability of rural population will accept, develop and maintain innovations mechanism for application. For the present situation, these environment friendly practices are being considered as environmentally safe, selective, environmentally friendly, economically viable and sustainable alternative for use in organic farming system [7]. There is no satisfactory and appropriate documentation of the end users made by

such researchers. Subsequently, very little literatures are available with different agriculturists about such practices. Agriculturists lack readymade combination these packages, else they can jump into various developing techniques, their fear and doubts about such efforts are kept unanswered. Hence, it was felt necessary to study the management aspects of eco-friendly practices in cotton and a study was designed with the following specific objectives.

1. To study the extent of knowledge of cotton growers about eco-friendly management practices.
2. To find out the relationship between personal, socio-economic, psychological and communication variables of cotton growers with knowledge level of environmental hazards and eco-friendly management practices.

Materials and Methods

The present research was carried out in the year 2014-15 in Yadgir district of North Eastern part of Karnataka. The major cotton growing talukas of the district Shahapur and Shorapur were selected. Eight villages were purposely selected based on number of cotton growing respondents present in the villages. A list of cotton growing respondents was secured from the village panchayat office and 20 cotton growers were randomly selected from each village by random sampling technique, so it makes a sample size of 160 cotton growing respondents. The data was collected from respondents by personal interview method is employed with the support of pre structured questionnaire made for carry out research.

Knowledge index was developed for the study of eco-friendly management practices. The data was analyzed from eco-friendly management practices was carried out using the scoring procedure developed for the purpose. Data were analyzed using the System Application Software (SAS). Appropriate descriptive statistical analysis such as frequency, percentage, mean, standard deviations, correlation co-efficient, multiple regression and path analysis were used to obtain the results of the data.

Results and Discussion

Distribution of Cotton Growers According to their Overall Knowledge about Eco-Friendly Management Practices

It is observed from [Table-1] that more than fifty per cent of respondents belong to medium knowledge category with respect to eco-friendly management practices in cotton, followed by low knowledge category (26.25%) and only 21.88 per cent of them belonged to high category. Adequate knowledge of any improved practice is a pre-requisite for its adoption. Research studies established that knowledge of an innovation would lead to its eventual adoption. The results expressed by the respondents regarding knowledge about eco-friendly management practices was at medium and low level to a greater extent. Through knowledge test, it was noticed that majority of the farmers had knowledge in respect of cultural, mechanical methods and selection of crops and cropping pattern. These facts might be the reason for the medium knowledge of eco-friendly practices.

Table-1 Distribution of Cotton Growers According to their Overall Knowledge about Eco-Friendly Management Practices (N=160)

Knowledge category	Cotton growers	
	Frequency	Per cent
High (17 & above)	35	21.88
Medium (13 – 16.99)	83	51.87
Low (Upto 13)	42	26.25

Mean = 14.36 S.D = 3.14

This trend evidently showed that the components, which are age old, low cost and those easy to practice, were known by all farmers. While, the practices, which were technically complex, involved high cost and needed special skills to practice were unknown to few of the respondents. The extension agency and development departments working in the area may take suitable measures to improve knowledge regarding eco-friendly technologies in general and specific technologies related to cottons in particular. The findings were in conformity with the findings of Kulshreshtha (1992) and Noorjehan *et al.* (2004) [8-9].

Correlation between personal, socio-economic, psychological and communication variables of cotton growers with knowledge of eco-friendly management practices

The correlation co-efficient values of all the 15 personal, socio-economic, psychological and communication variable with eco-friendly management practices of cotton growers are furnished in the [Table-2].

It could be seen from the table that the correlation coefficients of 10 characteristics viz., annual income, achievement orientation, innovative proneness, scientific orientation, risk orientation, extension participation, institutional participation, cosmopolitanness, mass media utilization, and attitude towards chemical fertilizers exhibited positively significant knowledge of eco-friendly management practices. But the characteristics like age, education, land holding, deferred gratification and economic motivation had non-significant relationship with knowledge of eco-friendly management practices.

Table-2 Correlation between Characteristics of the Cotton Growers and Their Knowledge of Eco-Friendly Management Practices (n=160)

Code No.	Characteristics	Correlation coefficient (r)
X ₁	Age	0.0913 ^{NS}
X ₂	Education	0.1002 ^{NS}
X ₃	Land holding	0.0194 ^{NS}
X ₄	Annual income	0.1792*
X ₅	Achievement motivation	0.1842**
X ₆	Innovative proneness	0.2059**
X ₇	Scientific orientation	0.1724*
X ₈	Risk orientation	0.2358**
X ₉	Deferred gratification	0.1125 ^{NS}
X ₁₀	Cosmopolitanness	0.1668*
X ₁₁	Economic motivation	0.1512 ^{NS}
X ₁₂	Attitude towards chemical fertilizers	0.1853*
X ₁₃	Extension participation	0.1657*
X ₁₄	Institutional participation	0.2061**
X ₁₅	Mass media use	0.1968**

NS – Non significant, * Significant at 5 per cent level

** Significant at 1 per cent level

Contribution of independent variables to the knowledge of cotton growers towards eco-friendly management practices

It was observed from [Table-3] that fifteen independent variables included in the study could explain 46.40 per cent variation in the knowledge level of eco-friendly management practices by cotton growers. Out of fifteen variables considered, only two variables namely, achievement orientation at 5 per cent and risk orientation at 1 per cent level was found to be positively significant in influencing the knowledge of eco-friendly management practices by cotton growers.

Table-3 Multiple Regression Analysis of Fifteen Independent Variables towards Knowledge of Eco-Friendly Management Practices By Cotton Growers (n=160)

Code No.	Characteristics	Regression coefficient	Standard error	t' value
X ₁	Age	- 0.0012	0.0229	- 0.0544
X ₂	Education	0.1367	0.1870	0.7310
X ₃	Land holding	- 0.1387	0.1334	-1.0396
X ₄	Annual income	0.0931	0.0751	1.4357
X ₅	Achievement motivation	0.1440*	0.0345	1.9623
X ₆	Innovative proneness	0.0871	0.0690	1.2631
X ₇	Scientific orientation	0.0846	0.0172	1.1878
X ₈	Risk orientation	0.2359**	0.0656	2.6531
X ₉	Deferred gratification	0.0587	0.0502	1.1709
X ₁₀	Cosmopolitanness	0.1598	0.1571	1.0174
X ₁₁	Economic motivation	- 0.0136	0.0499	- 0.2735
X ₁₂	Attitude towards chemical fertilizers	0.0202	0.0300	0.6714
X ₁₃	Extension participation	0.0318	0.1900	0.1671
X ₁₄	Institutional participation	0.0847	0.2082	0.4067
X ₁₅	Mass media use	0.1577	0.1222	1.2904

R² = 0.4640, F value = 2.0321* DF= (15,145)

* Significant at 5 per cent level, ** Significant at 1 per cent level

Hence, these two variables could be termed as good predictors of the knowledge

of eco-friendly management practices by cotton growers.

This indicated that the selected variable could explain forty six per cent of the variation in the knowledge and remaining fifty four per cent variation could be attributed to some other variables which were not indicated in the study. Even though a significant change in the knowledge of farmers towards eco-friendly management practices by cotton growers can be brought about by brining positive changes in these two significantly contributed variables.

This leads to the conclusion that achievement orientation and risk orientation had

significantly contributed to increase in knowledge of eco-friendly management practices by cotton growers.

Direct and indirect effect of independent variables on dependent variables - knowledge towards eco-friendly management practices of cotton growers

In order to gain insight into path through which the independent variables exert influences both directly and indirectly. Path analysis was carried out. The data presented in [Table-4].

Table-4 Path Co-Efficient Showing Direct, Indirect and Substantial Indirect Effects of Independent Variables on Dependent Variable – Knowledge of Eco-Friendly Management Practices By Cotton Growers

Code No.	Dependent variables	Direct effect	Total indirect effect	Substantial indirect effect through	
				1	2
X ₁	Age	0.0401	0.0512	0.0405X ₆	0.0272X ₅
X ₂	Education	0.0684	0.0318	0.0193X ₆	0.0118X ₁₃
X ₃	Land holding	-0.0642	0.0836	0.0248X ₆	-0.0134X ₅
X ₄	Annual income	0.0232	0.1560	0.0892X ₆	0.0135X ₁₅
X ₅	Achievement motivation	0.1245	0.0597	0.0401X ₆	0.0235X ₅
X ₆	Innovative proneness	0.0891	0.1168	0.0228X ₆	0.0196X ₁₀
X ₇	Scientific orientation	0.0107	0.1617	0.0213X ₆	0.0211X ₁₀
X ₈	Risk orientation	0.1342	0.1016	0.0726X ₁₂	0.0174X ₁₅
X ₉	Deferred gratification	0.0921	0.0204	0.0355X ₁₀	0.0338X ₁₅
X ₁₀	Cosmopoliteness	0.0832	0.0831	0.0103X ₆	0.0071X ₅
X ₁₁	Economic motivation	-0.0402	0.1914	0.0214X ₆	-0.0143X ₁₅
X ₁₂	Attitude towards chemical fertilizers	0.0462	0.1391	0.0167X ₆	0.0109X ₁₃
X ₁₃	Extension participation	0.0281	0.1376	0.0182X ₆	0.0058X ₅
X ₁₄	Institutional participation	0.0241	0.1820	0.0207X ₆	0.0065X ₁₃
X ₁₅	Mass media utilization	0.1194	0.0774	0.0219X ₆	0.0217X ₁₅

Out of 30 substantial effects, 12 pass through the variable X₆, 7 pass through X₅, 5 pass through X₁₅ and 2 each pass through X₁₃ and X₁₁, 1 each pass through X₆ and X₁₂

It was observed that risk orientation exerted the maximum (0.1342) positive direct effect, while scientific orientation exerted the least positive direct effect. The other factors exerting significant amount of positive direct effect were achievement motivation and mass media use. The maximum direct negative effects were exerted by land holding and economic motivation respectively.

Economic motivation (0.1914) showed the maximum positive indirect effect and deferred gratification (0.0204) minimum positive indirect effect. The other variables, which contributed favourably and positively, were institutional participation (0.1820), scientific orientation (0.1617) and annual income (0.1560). Further, it was also evident from the results that out 30 substantial effects, 12 pass through the variable risk orientation, 5 each pass through achievement orientation and mass media and 3 each pass through cosmopoliteness and extension participation, 1 each pass through innovative proneness and institutional participation.

The greater the number of indirect effects passing through a variable indicates that this variable is important in affecting the knowledge level of cotton growers towards eco-friendly management practices.

Conclusion

More than fifty per cent of respondents had medium level knowledge about eco-friendly management practices in cotton. Hence, it is of immediate need to train farmers regarding importance of eco-friendly management practices. To create awareness in these practices there is a need to organize effective extension activities like regular training programmes, demonstration, campaigns and regular farmers' meetings by the State Departments and other development departments concerned.

Conflict of Interest: None declared

References

- [1] Malathi D. and Bangarusamy U. (2001) Harmful effects of agricultural chemicals. *Agro-India Handbook on Food processing*. R. K. Business International, Bangalore, 232-235.
- [2] Asha K.R., Ameena M. and GeethaKumari V. I. (2001) *Kisan World*, 28(9), 36-37.

- [3] Addiscot T.M. (1996) *fertilizers and nitrate leaching. Agricultural chemicals and environment*. (Edt). R. E. Hoster and R. M. Harrison. The royal society of Chemistry,
- [4] Palaniappan S.P. and Annaduri K. (1999) Organic farming theory and practice. *Scientific publishers (India)*, Jodhpur, 10-23.
- [5] Anonymous (1980) Report and recommendations of organic farming, *USDA study team on organic farming*. US Govt. Office, Washington, D.C., 94.
- [6] Koshy Stephanus (2000) *Plant Horticulture Technology*, 1(6), 13-17.
- [7] Mandavi Mishra (2013) *International Journal of Agriculture and Food Science Technology*, 4(2), 11.
- [8] Kulshreshta N. (1992) *Pesticides information*, 17(3), 8-13.
- [9] Noorjehan A. Hanif K.A. and Ganesan R. (2004) *Journal of Extension Education*, 15(2 & 3), 3628-3632.