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A Critical Analysis of Management Behaviour of Horticultural Crop Growers of Dakshina Kannada Practicing Micro Irrigation Systems

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Abstract: A field experiment conducted during 2004-2005 to analyze the knowledge and extent of adoption of micro irrigation management practices among the horticulture crop growers in Dakshina Kannada district of Karnataka state revealed that 20% of the farmers were in high knowledge category and 10% were in high adoption category. It was observed that more number of farmers were noticed in medium category of risk orientation (80.00%), scientific orientation (60.00%) and innovative proneness (73.33%). Further, the statistical analysis revealed that these independent variables were non significantly related with overall knowledge and adoption level of Micro irrigation system management. These case study results may help in planning our policy of micro irrigation.

Introduction

Micro irrigation offers a large degree of control over water application, enabling accurate application of irrigation water according to crop water requirements. If managed properly, apart from giving high yield per unit of water used, it reduces water loss occurred due to evaporation and drainage (Tangi and Hanson, 1990).The irrigation performance is very poor in many horticulture crop areas around the world. The major problems are lack of state of art technology, socio-economic and environmental factors. There is good scope of increasing the production of horticulture crops by increasing yield per hectare through the adoption of modern techniques such as Micro irrigation. It is reported that in Maharashtra and other states Micro irrigation farmers are able to get a profit of rupees 1.25 to 2.50 lakh from an hectare fruit and vegetable crops (Phadtare *et al*., 1992). Looking to the advantages, efforts to increase the area under Micro irrigation are commendable but still many farmers are reverting to traditional system of irrigation after few years of experience with Micro irrigation systems. This is rather a big obstacle in the adoption process (Shashidhar, 2004). A farmer reverting to the traditional system after experiencing Micro irrigation systems is more dangerous than a farmer not adopting the Micro irrigation systems, as the farmer becomes a hitch in the process of technology transfer to the farmers around him. Majority of the systems may be defunct because of poor management (Shashidhar, 2004), indicating that the system knowledge and adoption levels of farmers is more important for its sustainability. Keeping these points in view a study was done in Dakshina Kannada to assess the knowledge and adoption levels of Micro irrigation system by horticulture farmers.

Material and Methods

The field investigation was conducted, during 2004-2005 in the Dakshina Kannada district of Karnataka. An ex-post- facto research design was employed to collect data from 30 Micro irrigation system owned farmers. Keeping in view the objectives and variables under study, a structural interview schedule was prepared by reviewing the previous research studies,

discussing with experts and professional workers in the field of Agriculture Engineering, Civil Engineering and Horticulture. The final schedule was prepared after necessary modifications, additions and deletions based on pre-tested results. The schedule was translated into local language and pre- tested for final use. The information was collected from the respondents in an informal atmosphere through personal interview. Collected data were analysed by employing simple statistical methods.

A teacher made test procedure was followed to measure the knowledge level of Micro irrigation farmers about selected management practices. The correct response was given a score of one, incorrect response was given a zero score, however if the answer is partially correct, fraction of score is also allotted based on number of points he gave correct information.

$$\text{Knowledge Index} = \frac{\text{Number of correct response}}{\text{Total number of knowledge items}} \times 100$$

Adoption of management practices, the adoption behavior of the respondents was measured by using the pre- tested list of practices, which have impact on determining the efficiency of the system. Later, the responses were quantified as given by Sengupta (1967).

Risk and scientific orientation is measured with the help of scale developed by Supe and Singh (1973).The items were noted on the five point continuum ranging from strongly agree, agree, undecided, disagree and strongly disagree with weightages of 5, 4, 3, 2 and 1 for positive statements and 1, 2, 3, 4 and 5 for negative items, respectively. The mean risk and scientific orientation score of the respondents was considered for categorizing the respondents into low, medium, and high.

Mouliks' (1965) self-rating innovation proneness scale was used to measure the innovative proneness of a farmer. The respondents were categorized into three categories high, medium, and low based on mean, percentage and standard deviation.

Results and Discussion

The knowledge of Micro irrigation management possessed by the horticulture crop growers in Dakshina Kannada is presented (Table 1). From the results, it is observed that the high knowledge of management practice was noticed by one -fifth respondents (20%), whereas medium knowledge was exhibited by 63.33% of respondents followed by low knowledge with 16.66% of Micro irrigation system owned farmers. This situation highlights that the knowledge of Micro irrigation management was comparatively lesser than expected. Lack of follow-up services by the Micro agency and non implementation of education programmes by the Department of Horticulture.

It could be seen from the results presented in table 2 that about 80% respondents were noticed in medium adoption category, whereas around one tenth of each was observed in high and low adoption category. This clearly shows that there is much gap in adoption of recommended management practices in micro irrigation. These results highlights for planning of effective extension activities by concerned departments and agencies. It was observed that, low percentage of farmers are ready to take the high risk for adoption of micro irrigation (3.33%), and 80% of farmers were noticed in middle category and remaining 16.66% farmers are not ready to bear the risk (Table 3). Very low percentages of farmers are thinking scientifically (16.66%) and nearly one fourth of (23.33%) farmers had low percentage scientific orientation rests were in the middle category (Table 4).

Table 1. Distribution of Micro irrigated horticulture crop growers according to their overall knowledge of management practices

Knowledge category	Micro Irrigation Farmers	
	Number	Percentage
High(Mean+1SD)	6	20
Medium	19	63.33
(Mean+1SD to Mean-1SD)		
Low (Mean-1D)	5	16.66
Mean=56.28		
Standard deviation=8.15		

Table 2. Distribution of micro irrigated horticulture crop growers according to their adoption level of management practices

Adoption category	Micro Irrigation Farmers	
	Number	Percentage
High (>Mean+1SD)	3	10
Medium		
(Mean+1SD to Mean-1SD)	24	80
Low(<Mean-1SD)	3	10
Mean=32		
Standard deviation=12.93		

Table 3. Risk orientation of micro irrigated horticulture crop growers

Risk orientation category	Micro Irrigation Farmers	
	Number	Percentage
High (>Mean+1SD)	1	3.33
Medium (Mean+1SD to Mean-1SD)	24	80.00
Low (<Mean-1SD)	5	16.66
Mean=26.60		
Standard deviation=2.55		

Table 4. Scientific orientation of micro irrigation farmers

Scientific orientation category	Micro Irrigation Farmers	
	Number	Percentage
High(>Mean+1SD)	5	16.667
Medium		
(Mean+1SD to Mean-1SD)	18	60.00
Low(<Mean-1SD)	7	23.33

Mean=23.93

Standard deviation=3.85

Table 5. Innovative proneness of micro irrigation farmers

Innovative proneness category	Micro Irrigation Farmers	
	Number	Percentage
High(>Mean+1SD)	1	3.33
Medium		
(Mean+1SD to Mean-1SD)	22	73.33
Low(<Mean-1SD)	7	23.33

Mean=12.77

Standard deviation=0.73

Results of Innovative proneness were also in line with the risk bearing capacity (Table 5). In micro irrigation though medium category adopters are high, this group is not safe because unlike other agriculture practices, partial adoption may give some yield but in case of micro irrigation non adoption any one management practice like lateral cleaning will lead to system failure. So, apart from concentrating low adopters and low knowledge respondents moderate adopter and knowledge persons also need to be covered under necessary training. The relationship between knowledge and adoption level of micro irrigation system with land area, high risk orientation, scientific orientation and innovative proneness were studied and results are depicted (Table 6). From the correlation analysis, it was observed that knowledge and adoption levels of the farmers were not influenced by land area, risk orientation, scientific orientation and innovative proneness. This shows that though the micro irrigation is a water conservation technology and cost effective technique, because of above facts it has not become either popular, or efficient. A suitable awareness program to educate the farmers regarding the suitability and adoptability of micro irrigation is highly eventual. A suitable feed back training system also needs to be introduced to strengthen adoption levels and to stop reverting from micro to traditional irrigation. A field guide for system maintenance and a technical training from system supplier will help to ensure full adoption of maintenance schedule of the system.

Table 6. Correlation coefficient of independent variables with knowledge and adoption level of micro irrigation farmers

Independent Variables	Dependent variables	
	Knowledge level Correlation Coefficient	Adoption level Correlation Coefficient
Land holding	0.1988 NS	0.2880 NS
High risk	0.2388 NS	-0.0675 NS
Scientific orientation	-0.0439 NS	-0.0232 NS
Innovative proneness	-0.0661 NS	-0.1009 NS

NS=Non Significant

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