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RESEARCH PAPER

A scale to measure the knowledge of marginal farmers on organic farming

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Abstract : The present study was aimed to construct, develop and standardize a knowledge scale on organic farming for marginal farmers. After going through several related literature, the researcher outlined a scale and after analyzing, the content framed 57 items related to the course. The prepared 57 items were revised and edited carefully and then given to a total 20 numbers of panel of experts in the field of agriculture namely entomology, horticulture, agronomy, soil science and scientists of RARS Titabor for their valuable suggestions and corrections to ensure its quality. Thus, the content validity of the tool was established. After seeking the opinion of the experts, some of the items were reframed. Finally, 44 items were considered to form initial test battery for developing a standardized knowledge test. These items were subjected to item analysis. After which, a total of 18 items were remained for the final study. The initial test prepared was pre-tested with 30 respondents from two villages. The items were revised and finally administered to 90 marginal farmers selected randomly from six non-sampled villages of Jorhat Development Block selected for the study to collect data for item analysis.

Key Words : Knowledge, Organic farming, Marginal farmer, Scale

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INTRODUCTION

Agriculture is the primary source of livelihood and the main souce of national income for most of the developing countries of the world. It is the largest economic sector in India and plays a significant role in the growth and development of the national financial system. After the green revolution was launched in India (1967-68), substantial increase in the production of food grains was achieved through the use of improved crop varieties and higher levels of inputs of fertilizers and plant protection chemicals. But it has now been realized that the increase in production was achieved at the cost of soil health and the gravity of environmental degradation resulting from faulty agricultural practices has caused alarm among the concerned farmers, scientists and greater viable and sustainable farming systems have become a necessity.

One such alternative agriculture system, which will help to overcome the problems of farming, is organic farming. Organic farming promotes the environmentally,

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socially and economically sound production of food farming and creates atmosphere to face various challenges of marginal and small farmers. Through organic farming, economic condition of farmers has been strengthened significantly which resulted better livelihood condition, more self-reliance and confidence among farmers (Azam and Banumathi, 2015).

The success and development of farming depend upon how well the farmer takes decisions. Therefore, it is very much important to have through knowledge on organic farming for taking sound decisions in farming. Hence, to measure the knowledge of marginal farmer about organic farming, a standardized knowledge scale was developed for the present study.

MATERIAL AND METHODS

A standardized knowledge scale was developed by following the procedures adopted by Devi (1987).

Collection of items:

Fifty seven (57) statements on the content area were prepared by consulting with text books, review of literatures, discussion with experienced farmers dealt with organic cultivation, extension literatures like news papers, bulletins and agricultural scientists of AAU. A thorough scrutiny of the prepared statements was done by a panel of experts (20 numbers) in the field of agriculture namely entomology, horticulture, agronomy, soil science and scientists of RARS, Titabor. Initially the knowledge statements were judged by the above panel by giving a tick mark in the form of relevant, not relevant and ambiguous. As per their judgments, 13 items were eliminated and finally 44 items were selected to perform initial knowledge test.

Forms of questions:

All the 44 items were selected to perform initial knowledge test were in the objective form having correct and incorrect type.

The initial test prepared was pre-tested with 30 respondents from two villages. The items were revised and finally administered to 90 respondents selected randomly from six non-sampled villages of Jorhat Development Block selected for the study to collect data for item analysis.

Item analysis:

Scores of one and zero were given for correct and incorrect responses respectively. Therefore, there was a possibility of respondents scoring the maximum of 44 points for all correct answers and zero points for all wrong answers. The scores obtained by the 90 respondents were arranged in descending order of total scores. The respondents were divided into six equal groups named as G1, G2, G3, G4, G5 and G6 with 15 respondents in each group. For item analysis, the middle two groups namely G3 and G4 were eliminated retaining only the four terminal groups with high scores (G1 and G2) and with low scores (G5 and G6).

Selection of items:

For selecting the items for final format of knowledge test of the respondents, the following criteria were considered:

Item difficulty index (P) :

Item difficulty was determined by the percentage of individuals able to pass each item. In practice, if an item is to distinguish among individuals, it should not be so easy that all persons can pass it, nor should be difficult that none are able to pass it.

The index of item difficulty indicated the extent to which an item was difficult. The item difficulty as worked out in the present study was P *i.e.* the percentage of respondents answering an item correctly. The item with P values ranging from 20 to 80 only was considered for the final selection of the knowledge test.

Item discrimination index (E1/3):

The second criteria for item selection were the discrimination index indicated by E1/3 value for an item. The function of item discrimination index is to find out whether an item really discriminates a well-informed respondent from a poorly informed respondent. The formula used is as follows:

$$\mathbf{EI/3} = \frac{\mathbf{(S1+S2)-(S5+S6)}}{\mathbf{N/3}}$$

where, S1, S2, S5 and S6 are the = frequencies of correct answers in groups G1, G2, G5 and G6, respectively. N = Total number of respondents in the sample selected for item analysis, *i.e.*, 90.

In the present study, the items with E1/3 values ranging from 0.20 to 0.80 were considered for the final selection for inclusion in the knowledge test.

Point biserial correlation co-efficient (rp bis):

For establishing internal validity of the check point biserial correlation co-efficient (rp bis) was estimated. Since the items were scored simply as 1 if correct and 0 if incorrect, the assumption of normality in the distribution of right -wrong responses was considered as unwarranted according to Garrett (1979). In this case, he considers point biserial r rather than biserial r as appropriate. It assumes that the variable which has been classified into two categories can be thought of as concentrated at two distinct points along a graduated scale or continuum. The formula for the point biserial r is:

$$\text{rp bis} = \frac{M_p - M_q}{\sigma} \times \sqrt{p_q}$$

where, rp bis = Point biserial correlation co-efficient.

M_p = Mean score on continuous variable of successful group on dichotomous variable.

$M_{q\,=}$ Mean score on continuous variable of unsuccessful group on dichotomous variable.

σ = Standard deviation on continuous variable for total groups.

p = Proportion of persons falling in successful group on dichotomous variable.

q = 1-p, or the second group.

Eventually, 18 items having significant biserial correlation at 0.01 level of and 0.5 level of probability were selected for the final knowledge check.

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Reliability of the knowledge test:

A split half reliability co-efficient of the test was computed by using the Spearman Brown formula and it was found to be 0.93. The reliability co-efficient of the whole test was estimated from the formula.

$$\text{rtt} = 2\,\text{roe}/1 + \text{roe}$$

where,

rtt = Reliability co-efficient of the whole test.

roe = Reliability co-efficient of the half-test, found experimentally.

Both these co-efficients provide an estimate of the internal consistency of the test and thus, the dependability

Table 1 : Distribution of statements according to different aspects of organic farming for standardize scale

Sr. No.	Statement
	Soil fertility
1.	Rotate crops to control weed, pest and to improve soil fertility
2.	Do not use kitchen wastes, plant wastes and animal wastes to fertile soil
3.	Do green manuring or plant cover crop to reduce soil erosion and improve soil fertility
4.	Do not practice intercropping / mixed cropping system because it can reduce soil fertility and water conservation
5.	Grow leguminous crops to improve soil fertility
6.	Do composting to improve soil fertility and water conservation
	Pest control
7.	Do mulching to control weed, pest and disease
8.	Do pruning to reduce diseases that attack plants
9.	Limit the use of chemical pesticides to control pest
10.	Implement monocropping system for the full year to decrease diseases
11.	Use trap methods to control pest and disease
12.	Do not use biological control agents to control pest
	Application of manure
13.	Use kitchen waste, FYM, plant waste in preparation of vermicompost
14.	Do composting of all sorts of waste vegetables, dry leaves and refuse to reduce fertilizer cost
15.	Limit the use of synthetic fertilizers to fertilize soil
16.	Use FYM only which is better than vermicompost
17.	Use manure when it is properly decomposed
18.	Do not mix manure with the soil before plantation

of the test scores.

Validity of the test:

Content validity was measured by the extent to which the items included in the test represent the total universe of respondents. The universe of the content was covered widely from the available literature and through interviews with several organic farmer, experts and extension personnel. Hence, it was assumed that the scores obtained by administering the knowledge test measures what it was intended to be measured.

The validity of the test-item was also tested by method of point biserial correlation co-efficient (rp bis). The items with highly significant biserial correlation co-efficients at 0.01 and 0.05 levels of probability indicated the validity of the items in relation to the knowledge test designed to measure the knowledge of the respondents.

The knowledge check developed could serve the purpose for measuring knowledge of the respondents about organic farming.

The final scale consisted of 18 (eighteen) statements.

Statistical method used:

Responses of the respondents were recorded on a three point continuum as know thoroughly, know somewhat and not known and scored as 3, 2 and 1.

On the basis of score obtained by the respondents, they were categorized into the 3 categories:

Category	Score range
Low	Below (Mean-SD)
Medium	(Mean-SD to Mean+SD)
High	Above (Mean+SD)

Conclusion:

It is concluded that the knowledge scale was developed and standardized with a total of eighteen (18) items with both positive and negative statements on soil fertility, pest control and application of manure of organic farming. The developed and standardized knowledge scale was valid and reliable. Hence, the scale could serve the purpose for assessing the organic farming for marginal farmers.

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