A SCALE TO MEASURE ATTITUDE OF THE FARMERS TOWARDS INTEGRATED PEST MANAGEMENT PRACTICES

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INTRODUCTION

Pest control traditionally mean use of chemical pesticides. There is no doubt about the fact that chemicals have played a significant role in the past for production of crops. However, their excessive and inappropriate use has resulted in degradation of our environment while our pest problems seem greater than ever. There are various reports of resistance of pests to pesticides, the number of pests out breaks have increased and many innocuous species have attended the status of serious pests. The extent of pesticide residue in environment is also a matter of great concern (Rajeha, 1998).

Presently, sustainable development has been widely accepted and it comprises a major thrust area of future development concerning economic activity and ecological sustainability.

Integrated pest management (IPM) is highlighted as a major step towards sustainability in agriculture as it couples environmental protection with practical concerns of providing stable long term pest control (Padhee, 1995). It is systematic approach to crop protection that uses increased information and improved decision making paradigms to reduce purchased inputs and improve economic, social and environmental condition on the farm and society (Alien and Rajotte, 1990).

Integrated pest management in agriculture is ideally an effective, economical, safe, ecologically sustainable and socially acceptable practice. It is the combination of cultural, physical, mechanical, biological and chemical methods to limit the harmful effects of crop pests (Krishnamurthy and Verabhadriah, 1999). Advancement of IPM technology has not yet been reached up to the farmers' fields to a desirable extent. This may be due to unfavourable attitude of the farmers towards such technology.

Attitude is the degree of positive or negative effects associated with some psychological object. Many past researchers have identified attitude as one of the important psychological attributes that influence the acceptance and adoption of agricultural production technologies. As corollary of this fact, this study was undertaken in 2002-2003 to construct an attitude scale for measuring, the farmers' attitude towards integrated pest management practices. In the study, attitude is operationally defined as the degree of positive or negative disposition associated with an individual farmer towards IPM practices.

METHODOLOGY

Among the techniques commonly used for constructing attitude scale, the method of summated rating suggested by Likert (1932) and Edwards (1957) was followed in the present study.

Collection and editing of attitude statements (Items)

The particular situation or object that produces the responses is called an item. An item is a manifest variable (Green 1958). The first step in developing the scale is the

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collection of items (statements) in such a manner that the acceptance or rejection of each one implies a different degree of favourable or unfavourable attitude towards the particular object being studied so that the important and relevant statements could be delineated and selected.

A list of 30 items reflecting that attitude towards IPM practices was prepared on the basis of relevant literature, informal discussion with the specialists and extension functionaries. The items so identified were carefully edited against the 14 criteria suggested by Edwards (1969).

Relevancy test

These 30 items were subjected to scrutiny by an expert panel of judges to determine the relevancy and their subsequent screening for inclusion in final scale. For this purpose, all the 30 items were sent to the 50 judges selected from various State Agricultural Universities and Indian Agricultural Research Institutes with a request to critically evaluate each item as to its relevancy to measure the attitude of the farmers towards IPM recommendations. They were also requested to give their opinion on a three point continuum ranging from highly relevant to not relevant. These responses were given score of 3, 2 and 1 respectively.

In all, 35 experts responded in time. The relevancy score for each item was found out by adding the score on the rating scale for all 35 experts responses. From the data so gathered, relevancy percentage, relevancy weight and mean relevancy score were computed for all the 30 items individually by using the following procedures/ formula:

I. Relevancy percentage : It was worked out by summing up the score of highly relevant and relevant categories which was converted into percentage.

II. Relevancy weight : It was obtained by using the following formula:

$$\text{Relevancy weight} = \frac{(\text{No. of highly relevant response x 3}) + (\text{No. of relevant response x 2}) + (\text{No. of not relevant response x 1})}{105 \text{ (Maximum score, i.e. 35 x 3)}}$$

III. Mean relevancy score : It was obtained by using the following formula:

$$\text{Mean relevancy socre} = \frac{(\text{Highly relevant score x 3}) + (\text{Relevant score x 2}) + (\text{Relevant score x 1})}{\text{No. of Judges responded (i.e. 35)}}$$

Using these three criteria, the items were screened for their relevancy. Accordingly, items having relevancy percentage of more than 65, relevancy weightage of more than 0.65 and mean relevancy score of more than 2 were considered for final selection of item. By this process, 24 items were selected in the first stage.

Item analysis: It is a procedure of eliminating those items which did not discriminate well between persons holding different attitude as stated by Edwards (1957). For this purpose a schedule constituting 24 items was prepared and used for personally interviewing 60 chickpea growers from non sample area. The farmers' responses to each item were recorded on a five point continuum ranging from 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree'. The positive items were scored 5, 4, 3, 2, 1 and negative items were scored 1, 2, 3, 4, 5; respectively. By summing up the scores given on the item responses each individual's total score was calculated.

For item analysis, the respondents were arranged in descending order based on the

attitude scores. Twenty five percent of top scores and 25 per cent of least scores who formed the criterion group were separated out for calculating the "t" values. The "t" values were calculated by using the formula suggested by Likert (1932).

The "t" value measures the extent to which a given item differentiates the high group from low group. Based on item analysis, 14 items were finally retained in the scale (Appendix - I) to measure the attitude of chick-pea growers towards IPM practices. Among the 14 items, 8 items were positive (item number 1, 3, 5, 7, 11, 12, 13 and 14) and 6 items were negative (item number 2, 4, 6, 8, 9 and 10).

Reliability of scale

The reliability of the attitude scale constructed in the present study was tested by split half method.

Split half method

The scale was administered to 60 respondents. Fourteen statements of the scale were divided into two equal halves with the even number statements in one half and odd number statements in the other half. The coefficient correlation between two sets of scores of the scale was computed and found significant (r=0.68) at 1 per cent level of probability and thus, the reliability of attitude scale was confirmed.

Validity of scale

A scale is said to be valid when it measures what it is supposed to measure (English and English, 1931). In the present study, the validity of the scale was tested by two ways.

(1) Content validity

The content validity is the representatives or sampling adequacy of the content of measuring instrument. The main criterion of the content validity is how well the contents of the scale sample the subject matter which is important for the study.

The items included in the scale were derived from various literature, experts' opinions and feelings as a measure of checks. Further, sufficient care was taken to include all the items which represented the universe of content of the chick-pea growers' attitude towards IPM practices for which the scale was being developed. In addition to this, based on the rating of 35 judges, the relevancy of the items was decided. This ensured high content validity of the attitude scale.

(2) Construct validity

The construct validity has been calculated by correlating adoption score with attitude scores (Haque and Ray, 1983; Chanda and Kaul, 1994 and Prasad and Siddarammaiah, 2000).

The construct validity in the present study was tested by calculating the correlation coefficient between adoption index and attitude score of 30 chick-pea growers. It was presumed that the more favourable the attitude of a respondent towards the IPM practices, the greater will be the adoption of these practices by the respondent. The adoption index was also developed in this study. The correlation coefficient between the adoption of IPM practices by chick-pea growers and their attitude towards the IPM practices was calculated and found to be significant (r=0.37) at 1 per cent level of the probability.

Fourteen attitude statements finally selected, have been randomly arranged in the final format of the scale. There were five columns representing five point continuum of agreement to disagreement to the statement as suggested by Likert (1932). The five points on the continuum were : strongly agree, agree, undecided, disagree and strongly disagree with the weights of

5, 4, 3, 2 and 1 for positive statements and 1, 2, 3, 4 and 5 for negative statements; respectively. This procedure was adopted by Prajapati and Trivedi (1994), Krishnamurthy and Verbhadraiah (1999) and Thakur and Kher (2000). The scale consisted 14 statements and the range of score was 14 to 42. The final format is given in Table 1.

Utility of the scale

The scale was found to be reliable and valid. Hence, this scale can correctly measures the attitude of chick-pea growers towards IPM recommendations. The scale can also be used on other crops where IPM is practiced with necessary changes in terminologies of IPM technologies with reference to that particular crop.

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APPENDIX - 1

A scale to measure attitude of farmers towards integrated pest management practices in chick-pea

Sr. No.	Attitude statement	SA	A	UD	DA	SD
1.	* There is no doubt that chemicals have played a significant role in the past in protection of crops (4.22)					
2.	The management of natural enemies and other beneficial organism of insects not reduce pest population (5.04)					
3.	Integrated Pest Management is an important key to provide sustainable agriculture and environmentally sound plant protection (3.33)					
4.	Integrated Pest Management is not mere economical than the use of conventional chemicals. (5.20)					
5.	Timely and judicious use of pesticides is essential for promoting sustainable agriculture. (4.20)					
6.	Pest can not be managed through summer deep ploughing in 2-3 years as well as simultaneous removal of stubbles (5.70)					
7.	*Pest population can also be checked by crop rotation (3.14)					
8.	By the use of tolerant/resistant crop varieties the pest damage may not be minimized. (3.80)					
9.	Through conservation and augmentation of natural enemies it is not possible to manage the pest (2.93)					
10.	By adoption of intercropping the losses due to pests can not be minimized (12.00)					
11.	*Timely sowing of crops can avoid the insects infestation (3.25)					
12.	*Spraying of bio-pesticides can also be done to control the pests. (3.55)					
13.	*Spray of chemicals should be used only at the economic threshold level of a particular pest. (4.00)					
14.	*Field sanitation helps to minimize the insect pest infestation. (4.57).					

* Positive statements "t" values are in parentheses SA = Strongly agree,
A = Agree, UD = Undecided, DA = Disagree SD = Strongly disagree