Development of Scale to Measure Attitude of the Farmers towards Drip Irrigated Banana Cultivation

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ABSTRACT

A scale was developed to measure the attitude of the farmers towards Drip Irrigated Banana Cultivation (DIBC) based on "Scale Product Method" which combines the Thurston's technique of Equal Appearing Interval Scale for selection of the items and Likert's techniques of summated rating for ascertaining the response on the scale. A tentative list of 25 statements was drafted keeping in view the applicability of statements suited to the area of study. The statements collected were edited in the light of the suggested criteria. These statements were framed in such a way that they expressed the positive or negative attitude of the farmers. The score of each individual item on the scale was calculated by summing up the weights of the individual items. Scale and Q value was calculated by using Thurstone and Chave inter-quartile range. Finally the scale consisted of 12 statements whose median (scale) values were greater than Q values. However, when a few statements had the same scale values, statements having lowest Q value were selected by arranging the scale value in an order. Reliability was tested with 20 respondents and its value was 0.76 and validity of the scale was examined.

Keywords: *Attitude, Reliability, Validity, Drip irrigated banana cultivation*

INTRODUCTION

Banana is one of the oldest fruit known to mankind. Banana is grown throughout the year and is well within the reach of a common man, that's why this fruit is called as "Poor man's apple." In India, Gujarat is one among the major banana growing states with an estimated area of around 60863 hectares of cultivation, out of this 16 per cent of the area under banana is under drip irrigation.Gujarat is known locally as jewel of the western India.It is located on the western coast of India, has witnessed unprecedented economic growth for almost a decade and significantly contributed towards overall development of country. Strategic location, state-of-the-art infrastructure, business friendlypolicies and proactive governance are the key catalytic strengths of Gujarat.The total geographical area of Gujarat state is 196.12 lakh ha, out of this, 106.31 lakh ha land is under gross cultivation, while total area under horticultural crops is 11.24 lakh ha. In Gujarat, slightly more than three-fourth (76.00 per cent) of the area under irrigation depends largely upon rainfall and remaining about one-fourth (24.00 per cent) of land is under irrigation (Anonymous, 2009). The area under drip irrigation in Gujarat has been increased sizably during last five to eight years. Drip irrigation system as a major plunk of modern science

and technology has been introduced with assumption that it's wide spread adoption will generate a dynamic spark resulting into techno-economic developments among the banana growers. The consequent effects of drip irrigation system are reflected in terms of generating more income from the banana cultivation by saving of water, labour, fertilizers and plant protection measures, improving yields and quality of produce which ultimately improving the overall economic condition of banana growers.The understanding of existing feeling of the farmers towards drip irrigated banana cultivation to develop agriculture as a whole and economic condition of farmers is one of the important issues to analyse in popularizing use of drip irrigation system in banana cultivation for agricultural development. For this, to collect reliable information on the attitude of the farmers towards drip irrigated banana cultivation there was a need of systematically developed valid and reliable attitude scale.Attitude has been defined as "the degree of positive or negative feeling, affect, opinion, action and belief associated with some psychological object" (Thurstone, 1946). Psychological object may be any symbol, institution, person, phrase, slogan, idea or ideal towards which people may differ from each other with respect to positive or negative aspect. The cognitive component of an

attitude consists of the beliefs, which involves attributes like favorable or unfavorable, desirable or undesirable, good or bad etc. The feeling component refers to the emotions which give attitude a motivating character or action tendencies. The action tendency component of an attitude includes all behavioral readiness associated with it. These three components of attitude, are, however, consistently related to each other.

METHODOLOGY

Attitude refers to the degree of positive or negative feelings associated with some psychological objects. In the present study, attitude is conceptualized as positive or negative feelings of farmers towards the acceptance of the drip irrigated banana cultivation as major crop understanding its positive and risky aspects. Among the techniques available for the construction of the scales, the Thurstone's Equal Appearing Interval Scale (1928) and the Likert's Summated Rating Scale (1932) are quite well known. Both the methods suffer from the limitations, the first one in getting discriminating response and second one in the selection of items. Thus, the technique chosen to construct the attitude scale was of "Scale Product Method" which is combination of the Thurstone's technique of equal appearing interval scale for selection of the items and Likert's technique of summated rating for ascertaining the response on the scale as proposed by Eysenck and Crown (1949).

Item collection

The items making up an attitude scale are known as statements. A statement may be defined as anything that is said about a psychological object. As a first step in developing the scale, 36 statements were collected from the relevant literature, major advisor, extension educationists, experts of horticulture and agricultural engineering from Anand Agricultural University. The statements, thus selected, were edited on basis of the criteria suggested by Thurstone and Chave (1928), Wang (1932), Likert (1932) and Edward andKilpatrick (1948) and at last, 25 statements were selected as they were found to be non-ambiguous and non-factual.

Judges rating of attitude statements

In order to judge the degree of "Unfavourableness" to "Favorableness" of each statement on the five point equal appearing interval continuum a panel of 50 judges was selected. The judges selected for the study comprised extension educationist, horticulturist and statistician with considerable practical experience in horticulture from the Anand Agricultural University and officials of horticulture department, Anand. The judges were visited personally along with letter of instructions to guide them for rating the statements in desired manner for each set of the statements.

Determination of scale and quartile value

The five points of the rating scale were assigned, ranging from 1 for most unfavorable and 5 for most favorable. On the base of judgment, the median value of the distribution, and the Q value for the statement concerned was calculated, the inter-quartile range for each statement was also worked out for determination of ambiguity involved in the statement from the following formulas.

$$S = L + \frac{0.50 - \Sigma Pb}{Pw} \times i$$

Where,

S = Median or Scale value of statement

L = Lower limit of the interval in which the 50th centile falls

ΣPb = Sum of the proportion below the interval in which the 50th centile falls

P_w = Proportion within the interval in which the 50th centile falls

i = Width of the interval, which was assumed as equal to 1.0

Thurstone and Chave (Edwards, 1957) used the inter-quartile range Q as a means of the variation of the distribution of the judgments for a given statement. To determine value of Q, two other point were measured, the 75th centile and 25th centile. The 25th centile was obtained by the following formula:

$$C_{25} + \frac{0.25 - \Sigma Pb}{Pw} \times i$$

Where,

S = Median or Scale value of statement

L = Lower limit of the interval in which the 25th centile falls

ΣPb = Sum of the proportion below the interval in

which the 25th centile falls

P_w = Proportion within the interval in which the 25th centile falls

i = Width of the interval, which was assumed as equal to 1.0

$$C_{75} = \frac{0.75 - \Sigma\, Pb}{Pw} \times i$$

Where,

S = Median or Scale value of statement

L = Lower limit of the interval in which the 75th centile falls

$\Sigma\, Pb$ = Sum of the proportion below the interval in which the 75th centile falls

P_w = Proportion within the interval in which the 75th centile falls

i = Width of the interval, which was assumed as equal to 1.0

Then the interquartile range or Q value was obtained by taking the difference between C_{75} and C_{25} thus,

$$Q = C_{75} - C_{25}$$

Final statements for attitude scale

When there was a good agreement among the judges, in judging the degree of agreement or disagreement of a statement, Q was smaller compared to the value obtained, when there was relatively little agreement among the judges it was reverse. Only those items were selected whose median (scale) values were greater than Q values. However, when a few items had the same scale values, items having lowest Q value were selected (Thurstone, L. L. 1946). Based on the median and Q values 12 statements were finally selected to constitute attitude scale. The scale values were ranging from 1.14 to 4.30 with 0.5 class intervals.

Reliability of the scale

A scale is reliable when it consistently produces the same result when applied to the same sample. In the present study, split-half method of testing reliability was used. The 12statements were divided into two halves with six odd numbered in one half and other six even numbered statements in the other. These were administered to 20 respondents. Each

of the two sets of the statements was treated as a separate scale and then these two sub-scales were correlated. The co-efficient of reliability was calculated by the Rulon's formula (Guilford, 1954), which came to 0.76.Thus, scale developed for the purpose was found quite reliable.

Validity of scale

Validity of the scale examined for content validity by determining how well content were selected by discussing it with 20 specialists, extension academicians, etc. thus, the present scale satisfied the content validity.

Scoring system

The selected 12 statements for the final format of the attitude scale presented in Table 2 are randomly arranged to avoid response biases, which might contribute to low reliability and detraction from validity of the scale. The responses can be collected on five point continuums *viz.*, strongly agree, agree, undecided, disagree and strongly disagree with respective weights of 5, 4, 3, 2, and 1 for the favorable statements and with the respective weights of 1, 2, 3, 4, and 5 for the unfavorable statements.

Table 1: Final statements of the scale to measure attitude of farmers towards drip irrigated banana cultivation

No.	Statement	SA	A	UD	D	SDA
1	I like drip irrigated banana (DIBC) cultivation as it saves water. (+)					
2	I believe that DIBC is not viable for illiterate farmers. (-)					
3	I favour DIBC as it reduces labour cost. (+)					
4	I am not in favour of DIBC due to the problems of intercultural operations. (-)					
5	I think that irrigated banana cultivation is possible even for average farmers. (+)					

No.	Statement	SA	A	UD	D	SDA
6	I believe that DIBC is not possible for longer period. (-)					
7	I believe that DIBC helps to produce quality banana production. (+)					
8	I feel that DIBC is unworkable due to mechanical damage caused by rodents. (-)					
9	I like DIBC as it helps in maintaining low weed infestation. (+)					
10	I hesitate to go for DIBC due to frequent mechanical damage. (-)					
11	I feel that DIBC requires less input. (+)					
12	Investment on drip irrigation system for banana cultivation is wastage of money. (-)					

SA – Strongly Agree, A-Agree, UD-Undecided, D Disagree, SD – Strongly Disagree

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