A TEST TO MEASURE KNOWLEDGE ABOUT RECOMMENDED JOJOBA CULTIVATION PRACTICES

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ABSTRACT

Knowledge of the farmers plays an important role in adoption of recommended Jojoba cultivation practices. A high technical nature of recommended Jojoba cultivation practices would lead to higher adoption and accumulated in the minds of the jojoba farmers; knowledge both undergoes and produces changes in the thinking process. Keeping in this view a scale was developed to measure the knowledge of famers about recommended Jojoba cultivation practices. A tentative list of 36 items was drafted keeping in view the application of statement suited to the area of study. After getting jury opinion on the items of test, Item difficulty index, Discrimination index and items of validity were worked out. Finally, 30 statements were selected in the final format to measure knowledge of the jojoba farmers. The reliability coefficient (rtt=0.77) obtained indicated that the internal consistency of the knowledge test developed for the study was very high.

Keywords: *Knowledge, Recommended Jojoba cultivation practices, Reliability*

INTRODUCTION

Any enterprise to run in profit requires good knowledge about varies activities to be taken up to run the enterprise and management of these activities better way. Knowledge plays an important role for achieving desired results. Bloom et al. (1955) considered knowledge as "those behaviour and test situations which emphasizes the remembering, either by recognition or recall of ideas, material or phenomena". Knowledge according to English and English (1961) is a body of understood information possessed by an individual or by a culture. Hence, to perform active role in any activities, information being understood play an important role. The purpose of the research was studying the prevailing Jojoba cultivation practices among the farmers. The results about prevailing practices of Jojoba cultivation will be of paramount importance for personnel of state agriculture department and AJORP involved in promotion of this crop. Furthermore, the study investigates the existing level of knowledge of Jojoba growers about Jojoba cultivation technology. The findings about knowledge level of recommended Jojoba cultivation practices would help both governmental as well as private agencies working in field of organization of training and transfer of technology about Jojoba cultivation among the Jojoba growers. With these results they will be in a position to impart the knowledge to the respondents in the needed areas. An effort has been made to know the attitude of the respondents towards Jojoba cultivation technology. For measuring the knowledge level, a knowledge test was constructed and standardized with help of the following techniques.

METHODOLOGY

Selection of item

The content of knowledge test is composed of questions called items. With the help of experts in the field of Agriculture and available literature, information pertaining to developing of knowledge test was gathered and different items on various aspects were prepared and enlisted. The items were then classified into nine major sub-heads: Soil selection and its preparation, Nursery raising, Transplanting, Manures and fertilizers, Irrigation, Plant protection measures, Pruning and intercropping, Harvesting and Marketing. Keeping the following three criteria in view, the items were selected for the study.

(1) The items should provide thinking rather than simply rote memorization.

(2) The items should differentiate the well-informed farmers from the poorly informed farmers and should have certain difficulty value (Jha and Singh, 1970 and Preethi et al., 2015)

(3) The items included should cover all the areas of the knowledge about recommended Jojoba cultivation practices

Analysis of item

The item analysis of a test usually yields two kind of information *i.e.* item difficulty index and item discrimination. The collected items were numbered from the 1 to 36 and administered to the 30 respondents selected randomly from non-sampled area. Each respondents was given the score of 1 and 0 for dichotomized response of 'correct' or 'incorrect' and for 'yes' or 'no' answers, respectively. Thus, the range of obtainable score was 0-36. These 30 respondents were divided into six equal groups, each of six and were arranged in descending order of the score obtained by them. Each group of made 5 respondents and the groups were named G1, G2, G3, G4, G5 and G6 respectively. For item analysis the middle two groups namely G3 and G4 were eliminated retaining only the four terminal groups with high score (G1 and G2) and with low score (G5 and G6), score of these groups ranged as follows:

Group	Score out of 80	Group	Score out of 80
G1	35 to 30	G4	20 to 23
G2	29 to 27	G5	18 to 20
G3	26 to 24	G6	13 to 16

Item Difficulty Index (P_i)

The index of difficulty was worked out as the percentage of the respondents answering as item as correctly. The assumption in this item index of difficulty was that the difficulty related to the level of respondents' knowledge about recommended Jojoba cultivation practices. When a respondents answers items, it was assured that the items was less difficult than his ability to cope with it. The index of the item difficulty indicates the extent to which an item is difficult. An item should neither be so easy that all persons can pass it nor should it be so difficult that none can pass it. The item with difficulty P_i values ranging from 20 to 85 were considered for final selection of the knowledge test battery. It was calculated by following formula:

$$P_i = \frac{n_i}{N_i} \times 100$$

Where,

P_i = Difficulty index in percentage of the ith item.

n_i = Number of respondents giving correct answer to i^{th} item.

N_i = Total number of respondents to whom the ith item was administered *i.e.* 30

Discrimination Index ($E^{1/3}$)

The Second criterion for item selection was the discrimination index indicated by $E^{1/3}$ value for an item. The function of items discrimination index is to find out whether an item really discriminates a well-informed respondent from poorly informed respondents. In the present study, the items with $E^{1/3}$ values ranging from 0.20 to 0.85 percent were considered for the final selection in the knowledge test. Discrimination index $E^{1/3}$ was worked out by using formula:

$$E^{1/3} = \frac{(S_1 + S_2) - (S_5 + S_6)}{N/3}$$

Where,

$E^{1/3}$ = Discrimination index of an item.

S_1, S_2, S_5, S_6 = the frequencies of correct answers in groups G_1, G_2, G_5 and G_6, respectively

N = Total numbers of respondents in the sample of item analysis; here it was 30

Biserial correlation is used for the test items validation, when the criterian of validity is regarded as internal consistency i.e. the relationship of total score to a dichotomized response to any given item. Keeping this in view, the Biserial correlation of each of the items was calculated, and the significance of the Biserial correlation coefficient was tested with help of formula used by Guilford (1965). The items which were found significant at 5 per cent level of significance were retained in the final format of the knowledge test battery.

$$\text{Biserial correlation (rbis)} = \frac{Mp-Mq}{\sigma t} \times \frac{pq}{y}$$

Where,

Mp = Mean of x values for higher group in dichotomized variable

Mq = Mean of x values for lower group in dichotomized variable

p = Proportion of cases in higher group

q = Proportion of cases in lower group

y = Ordinate of the unit normal distribution curve with surface equal to 1.0 at the point of division between segments containing p and q proportion of the cases.

$$\sigma t \quad = \quad \frac{\Sigma x^2}{n} \quad - \quad \frac{(\Sigma x)^2}{n}$$

Where;

Σt = Standard deviation

Σx² = Sum of square of the responses of respondents

Σx = Sum of values of the responses for all the items

n = No. of respondents

Test of significance of rbis:

The coefficient of biserial correlation were tested for their significance by using the following formula as given by Guilford (1965)

Where,

rbis = Biserial correlation

√Pq / y – r²bis = Standard error of biserial correlation

√N = Total number of respondents

The co-efficient of Biserial correlation was tested for significance by using the formula as given by Guildford (1965)

Representative items of the test

Though the aforesaid criteria were the main consideration for the final selection of the knowledge items, care was taken not to eliminate the important aspect, if any. Finally, 30 items were selected, which formed the actual (final) format of the knowledge test. The items are presented in Table 1.

Table: Final format of the Knowledge test for jojoba grower's knowledge regarding recommended jojoba cultivation practices

Sr. No	Questions	'T' value
1	What kind of soils is suitable for Jojoba cultivation?	3.608
2	What is the best time for soil / field preparation?	2.966
3	What is the right time of nursery raising?	2.348
4	What is the size of nursery for one hectare cultivation of Jojoba?	4.192
5	Name at least two scientific methods of Jojoba planting material preparation.	4.543
6	What ratio of male and female plants is needed in the field?	2.560
7	What should be the row to row distance in Jojoba?	6.328
8	What should be the plant to plant distance in Jojoba plantation?	2.728
9	How many seedlings/ rooted cuttings are required for one ha. transplanting?	2.327
10	What quantity of fertilizers (NPK) per ha. is generally recommended for first year ?	3.782
11	What is the appropriate time of NPK application?	4.438
12	What is the interval between two irrigations in adult (8 years old) plants?	3.640
13	What method of irrigation is mostly used in Jojoba cultivation?	4.203
14	Does the stagnation of water for long period rot the crop?	4.589
15	Name at least one disease/ one most damaging insect pest of Jojoba.	5.450
16	Name any one insecticide with dose to control termite.	5.896
17	What precaution is required while hoeing and weeding?	3.820
18	At what time pruning is done?	3.544
19	What is the average yield of a Jojoba plant after 8th years?	3.427
20	What are the maturity symptoms of the fruit for harvesting?	3.330
21	Which year Jojoba starts producing seeds?	4.403
22	What is the present price of good quality Jojoba seed?	2.082
23	What is the cost benefit ratio of Jojoba cultivation in market?	3.521

Reliability and validity of the knowledge test

The reliability examined by employing split halves method. The 30 items were divided into two equal halves, with 15 odd and the 15 even. These were administered purposively to 20 respondents separately. Having obtained the two sets of scores for each of the respondents, coefficient of correlation between two sets of score was calculated, which was found to be significant. The reliability coefficient (rtt=0.77), thus obtained indicated that the internal consistency of the knowledge test developed for the study was high.

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