Original Research Article

Developing an intellectual learning scale to test knowledge level of Kiwi Growers of Arunachal Pradesh on Package of Practices of Kiwi

ABSTRACT

The knowledge test was developed to measure the knowledge level of kiwi growers. In all 36 items were predominantly fabricated on the basis of indorsing rational rather than root memorization and to discriminate the sound knowledgeable kiwi growers from the ailing knowledgeable ones. The scores obtained from sample respondents were imperilled to item analysis, embracing of item difficulty index & item discrimination index. In the ultimate selection, the scale consisted of 15 items with difficulty index ranging from 30-80 and discrimination index ranging from 0.30 to 0.55. Split-Half method was employed to check the reliability of knowledge test being developed and it was found to be 0.711.

Keywords: *Knowledge test; Kiwi growers; Difficulty index; Discrimination index; Reliability*

Introduction

Kiwi belongs to the genus Actinidia (Actinidiaceae) and is derived from a deciduous, woody fruiting vine. It is composed of different species and cultivars that parade a multiplicity of physical features and sensory attributes. Kiwi plants were initially grown in mountainous, forested regions of China (as Chinese gooseberry), where it is also identified as mihoutau [1, 2]. During early 20th century its seeds were brought to New Zealand, where it was ultimately domesticated, rechristened, and vended globally. At present, commercial growth of the fruit has spread to voluminous countries including the United States, Italy, Chile, France, Greece, Brazil, and Japan [3, 4 & 5]. Some of the major producing districts in Arunachal Pradesh are Upper Siang, Tawang, Dibang Valley, Lower Subansiri and West Kameng. Kiwi is a multi-nutritional berry as its has high contents of Vitamin C and total polyphenols, which ranges from 92 mg – 132 mg per 100 g of fresh weight [6]. Kiwi fruit was first introduced in India in 1963 in Shimla [7] and later spread to other part of the country. Introduction of Kiwi in Arunachal Pradesh is of recent and has assumed tremendous popularity and preference among the growers as well as consumers due to its favourable properties for easy maintenance and marketing besides having high nutritional and medicinal values. The Kiwifruit of the state has already attained commercial identity not only in the local markets but also in the national as well as international markets. The total area and production under kiwi cultivation during the year 2015-16 was reported to be 4052 Ha and 4956 MT as well as productivity of 1.22 respectively [8].

Knowledge is an important tool, which facilitates farmers in decision making to adopt the recommended practices to make Kiwi farming more profitable and sustainable. The knowledge test of Kiwi may also create the cognizance about prominence of espousing scientific cultivation practices by the growers as well as help to bond the knowledge gap between the farmer and researcher and harvest gap between farmer's field and research station. Thus, it may also expedite the growers to realize turnover and have improved livelihood security, capability to educate their children, secured source of income and reduced susceptibility. On this milieu, an attempt was made to develop knowledge test on Kiwi cultivation practices for its application to the farmers in Arunachal Pradesh.

MATERIALS AND METHODS

Item assortment: The content of knowledge test was composed of questions called items. Items for the test were compiled from different sources, such as literature, field extension personnel, subject matter specialists in horticulture and the researcher's own experiences. The questions were designed to test the knowledge level of kiwi owners about dairy farming practices.

Pilot miscellany of items: The assortment of items was done on the basis of the following standards:

(i) It should indorse cogent rather than rote-memorization, and

(ii) It should extricate the well-informed Kiwi growers from the ill-informed ones and have a convinced difficulty value. Based on these two methods 36 items were primarily collected for creation of the knowledge test were in objectives form *i.e.* dichotomous or multiple choice format. A schedule was thus prepared with these 36 items for administering it to the Kiwi growers for item analysis and screen out supplementary items.

RESULTS & DISCUSSION

Preliminary administration of test: Items were pretested and modified by administering to 30 randomly selected kiwi growers. Score was given as '1' for right and 0 for wrong answer for each of the 36 items. The total correct response was the knowledge score obtained by an individual farmer. The farmers were then distributed into 6 groups (G1 to G6) each having 5 farmers. The farmers in each group were arranged in plunging order according to the scores obtained by them. Only four extreme groups with high and low scores were ruminated for calculation of item difficulty and item discrimination indices.

Item analysis: The item analysis of a test yields two kinds of information: item difficulty and item discrimination as reported by [9]. The index of item difficulty exposed how difficult an item was whereas the index of discrimination specified the magnitude to which an item discriminates to well notify individuals from the ill-informed ones.

Item difficulty index (Pi): The difficulty index of an item was defined as the proportions of kiwi growers giving precise responses to that particular item. This was calculated by the formula:

$P_i = n_i/N_i \, X100$

Where, P_i = Difficulty index in percentage of the i^{th} item.

n_i = Number of Kiwi growers giving correct response to i^{th} item.

N_i = Total number of Kiwi growers to whom i^{th} item was administered

Item discrimination index: The discrimination index was calculated by employing the method given by Mehta (1958). Item discrimination index was calculated by the formula given below:

$$E^{1/3} = \frac{(S1 + S2) - (S5 + S6)}{N/3}$$

Where, S1, S2, S5 and S6 were the respective frequencies of correct answers in G1, G2, G5 and G6 groups respectively, and N = Total number of Kiwi growers in the sample of item analysis.

Selection of items for test: Two standards *i.e.* item difficulty index and item discrimination index were calculated for throng of items in the ultimate set-up of the knowledge test. In the present study, items with difficulty index indecisive from 30 to 80 and discrimination index indecisive from 0.30 to 0.55 were included in the ultimate set-up of the knowledge test. Item difficulty index and item discrimination index of all the 36 items were calculated and 15 items which satisfied both the criterions were selected for the ultimate set-up of knowledge test as shown in Table-1.

Table 1: Difficulty Index (DI) and Discrimination Index (Disc. Index) for Knowledge Test Items

Item No	Statements	DI	Disc. Index	S= Selected item and R = Rejected item
1.	Which of the following variety of kiwi is/are recommended for your area? Kindly suggest any other variety if you know.	70	0.9	R
2.	Do you know the most suitable time/month for plantation of kiwi and its follow-up?	76.67	0.7	R
3.	Do you know the optimum temperature during the growing season for kiwi cultivation?	60	0.7	R
4.	Which of the following is/are the soil recommended for improved kiwi cultivation?	80	0.4	S
5.	Do you seed treatment of kiwi for improved cultivation? If yes, kindly share your knowledge/skill.	26.67	0.3	R
6.	Which of the following is/are the recommended pit size for kiwi seedling transplantation?	63.33	0.6	R
7.	What is/are the recommended spacing for kiwi cultivation?	56.67	0.1	R
8.	What do you understand by the term training of kiwi?	90	0.1	R
9.	Which type of training system is widely used in kiwi plantation?	86.67	0.1	R
10	What do you understand by the term pruning of kiwi?	83.33	0.1	R
11.	In a year, kiwi can be pruned on how many occasions?	36.67	-0.2	R
12.	What do you understand by the term fruit thinning of kiwi?	36.67	0.1	R
13	Fruit thinning should be done at the early stages of fruiting?	76.67	0.1	R
14.	Whether male kiwi plants bear fruits or not?	70	0.4	S
15.	Kiwi is a dioecious plant or not?	60	0.3	S
16.	Whether a kiwi plant can tolerate water stagnation or not.	53.33	0.1	R
17.	What is/are the quantity of farm yard manure to be incorporated during planting? (per vine/year)	56.67	0.9	R
18.	What is/are the total recommended fertilizer dozes for improved kiwi cultivation?	53.33	0.5	S
19.	Which of the following is/are the recommended time period for irrigation?	60	0.9	R
20.	Which of the following irrigation system is/are the recommended for large commercial plantation of kiwi?	73.33	0.3	S
21.	Do you know about weeding schedule in kiwi? If yes, how do you follow the recommended schedule of weeding to control the weed?	63.33	0.5	S
22.	Do you know what kind of material is used for mulching kiwi tree?	63.33	0.2	R
23.	Name the important pests of kiwi.	63.33	0.4	S

Item No	Statements	DI	Disc. Index	S= Selected item and R = Rejected item
24.	Name the diseases of kiwi.	60	0.3	S
25.	Do you know IPM on improved kiwi cultivation? Please share important IPM techniques on improved kiwi cultivation.	20	0.5	R
26.	Which method of propagation of kiwi yields early maturing of fruits?	73.33	0.3	S
27.	What do you understand by the term Hybrid? If yes, mention hybrid varieties of kiwi.	26.67	0.4	R
28.	In which of the following year/years commercial bearing of kiwi fruits begins?	66.67	0.1	R
29.	Which of the following is/are the indication for harvesting of kiwi?	63.33	0.4	S
30.	Which of the following is/are reason for acidic taste of kiwi fruits?	70	0.4	S
31.	Which of the following is/are the optimum temperature during the storage of kiwi?	63.33	0.3	S
32.	Which of the following is/are results of keeping bee colonies in kiwi orchard?	50	0.5	S
33.	Which of the following is/are the storage life of kiwi fruits after harvesting?	36.67	0.2	R
34.	What do you understand by the term ‘’grading of kiwi.” If you know, please mention grading of kiwi fruits is done on what basis?	40	0.3	S
35.	Which of the following is/are the materials used for packing apple fruits?	36.67	-0.1	R
36.	Do you know and visit nearby market where kiwi auction is held to market the produce?	60	0.3	S

Reliability: The reliability of knowledge test being developed was tested by using Split-Half method: The co-efficient of Co-relation between two sets of scores was calculated and found to be 0.711 was significant at 1% level thus indicating that the internal consistency of the knowledge test developed for the study was relatively high.

Content validity of knowledge Test: In the final selection of items, caution was taken to contain items covering the whole universe of pertinent behavioral facets of the respondents with respect to knowledge about kiwi growing practices. Items were collected through various sources including whizzes and henceforward it was presumed that the scores obtained by administrating this test has measured the knowledge of the respondents as envisioned.

CONCLUSION

In terms of entrepreneurship development, scientific knowledge of growing kiwi is of prime importance. It is also crucial for assessment and concocting of need based arrangement for the socio economic development of kiwi growers. But hardly there is any such standard procedure for testing the knowledge level of kiwi growers. With this circumstantial a knowledge test scale was developed to contemplate the knowledge level of the kiwi growers. Knowledge test constructed was found to be exceedingly firm and consistent for measurement of the knowledge level of the kiwi growers. So, out of the aggregate 36 item statements only 17 item statements were incorporated in the final knowledge test.

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