Training Needs Assessment of Kiwi Growers in Lower Subansiri District of Arunachal Pradesh, India

M. Deepa Devi*[1], H. Yadii[2] and Daya Ram[3]

A B S T R A C T

The study was conducted during December 2019 to February 2020 in Lower Subansiri District, Arunachal Pradesh to assess the training need areas of kiwi growers wherein a total of 104 farmers were drawn as respondents through random sampling. The data were collected personally through pre-tested well-structured interview schedule. The response collected from 104 respondents showed that majority (61.54%) of the respondents had exhibited medium level of training needs. Plant protection measures, propagation and planting, and climate and soil were the top three areas perceived as priority areas in regard to training need areas of the respondents, and the least training need area was in flowering and pollination. The study also revealed that weed problems under bio-physical constraints; high cost of inputs under socio-economic constraints; lack of improved irrigation system and lack of suitable technology for the region under technological constraints; non-availability of insurance under institutional constraints were among the many constraints perceived by the kiwi growers.

Key words: *Actinidia deliciosa*, Arunachal Pradesh, Kiwi growers, Training, Constraints

Kiwi fruit (*Actinidia deliciosa* var. deliciosa) known as 'China's miracle fruit' is native to China and has gained enormous popularity in the past two decades in many countries of the world. In fact, no other fruit has attracted so much attention in such a short period in the history of commercial fruit production.

The kiwi fruit is a temperate fruit crop; its cultivation is limited to certain temperate regions. Arunachal Pradesh is the leading producer of kiwi fruit in India with an area of 3,379 ha and an annual production of 6,047 tons. As of the year 2015-16, according to the National Horticulture Board (NHB), Arunachal Pradesh contributed to more than 50 per cent of the total kiwi fruit produced in the country [1]. India produces approximately about 8,500 tons of kiwi fruit; just one fourth of its total demand. India imports 75 per cent of its domestic demand for fresh kiwi fruit. In 2016, it imported 24,481 tons of fresh kiwi fruit by spending US$ 32 million [2]. In spite of the fact that Arunachal Pradesh is the leading producer of kiwi fruit in India, there still exists a lacuna to compete with the imported kiwi fruits. The farmers can progress economically if relevant technical know-how is imparted to them in context of kiwi fruit cultivation. Training is a process of acquisition of new skills, attitude and knowledge in the context of preparing for entry into a vocation or improving one's productivity in an organization or enterprise [3]. Effective training requires a

clear picture of how the trainees will need to use information after training in place of local practices what they have adopted before in their situation. In order to make any training meaningful and effective, it is imperative on the part of the training organizers to identify the training needs of the farmers basing on which a suitable training module can be developed so that the right training is given to the right people, in the right form, at the right time and at the right costs so that higher degree of productivity and profitability can be achieved. Training of farmers essentially contributes to human resource development in agriculture. The present study was conducted with following specific objectives:

i. To assess the training needs of the kiwi growers, and
ii. To identify the constraints perceived by the kiwi growers.

MATERIALS AND METHODS

The study was conducted in Lower Subansiri District of Arunachal Pradesh during December 2019 to February 2020 to assess the training need areas of kiwi growers. An *exploratory research design* was followed for the current study. Ziro-I block was selected purposively out of the two blocks (Ziro-I block & Ziro-II block) in the particular district. All the seven villages and a town of the particular block were considered for selection of the respondents. A total of 104 kiwi growers were selected through random sampling method where eighty percent of the total kiwi growers from each every one of the seven villages and a town under Ziro-I block were selected. The data were collected personally through pre-tested well-structured interview schedule.

*M. Deepa Devi
deepa.mairembam@gmail.com

[1-3]Department of Extension Education, College of Agriculture, Central Agricultural University, Imphal - 795 004, Manipur, India

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To understand the background of kiwi growers a total number of twelve characteristics viz., age, educational status, family type, family size, size of land holding, annual income, training exposure, risk orientation, innovation proneness, economic motivation, extension contact and mass media exposure were studied under the socio-personal, psychological and communication characteristics of the kiwi growers. The empirical measurement of these variables was done with the help of structured schedule specially designed and developed for the purpose of the investigation.

For the assessment of training needs, a list of 11 major areas of training needs in relation to improved package of practices of kiwi cultivation was prepared after consultation with scientists and experts. The training need areas of the respondents in the main areas of training in relation to kiwi cultivation as perceived by them were measured by using a three-point continuum scale i.e. Most Needed (MN), Needed (N) and Least Needed (LN) with a score of 3, 2 and 1 respectively. The relative needs for training in the main areas as perceived by the respondents were studied by working out the weighted mean score (WMS) and rank-order of the WMS. The weighted mean score (WMS) of training needs in the area of kiwi cultivation is the ratio of the total training needs score obtained by 'n' respondents in that particular area, to the total maximum possible score of 'n' respondents, expressed in a grade scale of 3, i.e., the highest score in the response categories. Based on the total scores secured by the respondents over the 11 main areas, they were classified into 3 categories i.e., 'low', 'medium' and 'high' training needs by considering the mean ($\ddot{X}$) and standard deviation (S.D).

For identification of constraints perceived by the kiwi growers, the respondents were requested to put forward the problems faced by them concerning kiwi cultivation. Each respondent was asked to indicate his/her opinion on the basis of dichotomous response (Yes/No). If the response was positive, a score of 1 was assigned and a score of 2 was assigned for negative response.

RESULTS AND DISCUSSION

Keeping in view the objectives, the present study was divided into three parts viz., training needs assessment in relation to improved package of practices of kiwi cultivation and constraints perceived by the kiwi growers.

Training needs assessment in relation to improved package of practices of kiwi cultivation

Climate and soil

On the basis of the measure of the mean score and the perceived importance of the training need areas in context of kiwi cultivation, it was found that the sub area, 'soil management' with mean score of (2.30) followed by 'soil treatment' with mean score of (2.26), 'knowledge of soil and soil type' with mean score of (2.03)' 'knowledge of climate type appropriate for the crop' with mean score of (1.54) were ranked I, II, III, IV respectively [4].

Propagation and planting

Data in (Table 1) revealed that training needs of the respondents based on weighted mean score was found most important in the field of 'varieties' having mean score of (2.36) and ranked I followed by 'time of planting' having mean score of (2.16), 'spacing (row to row and plant to plant)' having mean score of (2.10), 'treatment of planting material'

having mean score of (2.03) and were ranked II, III, IV respectively. Likewise, 'knowledge of planting material' having mean score of (1.95) was ranked V and 'method of propagation' having mean score of (1.72) was ranked VI [5].

Land preparation and layout:

The results in (Table 2) explicate that the respondents perceived most important training need in the area of 'identification / knowledge of male and female plants' with mean score of (2.44) followed by 'male to female ratio' with mean score of (2.37), 'pit size' with mean score of (1.62) and 'row orientation' with mean score of (1.49).

Training and pruning

The training need areas perceived as most needed by the respondents in the field of 'training and pruning' were 'knowledge on training/trailing system' with mean score of (2.06), followed by 'no. of training and pruning' with mean score of (1.88) and 'time of training and pruning' with mean score of (1.52).

Nutrient management

Table shows that, 'usage and dosage of bio-fertilizers' with mean score of (2.20), 'knowledge of bio-fertilizers' with mean score of (2.18), 'knowledge of fertilizers and chemicals' with mean score of (1.89), 'recommended dose of FYM' with mean score of (1.87) and 'time of application of FYM' with mean score of (1.84) were ranked I, II, III, IV and V with respect to importance of training needs [6].

Irrigation management

It is evident from (Table 1) that on the basis of mean score, 'knowledge of critical stages for irrigation' (1.91), 'method of irrigation system' (1.55) and 'the appropriate irrigation time interval to be followed' (1.46) were ranked I, II, III respectively.

Weed control

The data portrayed in (Table 1) revealed that training needs of the respondents based on weighted mean score was found most important in the field of 'control of weeds' (2.62) followed by 'knowledge of weedicides' (2.15) and 'identification of weeds' (1.79) and were ranked I, II and III respectively.

Plant protection measures

(a) *Insect-pest control*: Data showed in (Table 1) revealed that training needs of the respondents were found most important in the area of 'control of insect/pests' with mean score of (2.19) followed by 'knowledge of insecticides' with mean score of (2.02) and 'identification of insects/pests' with mean score of (1.93) and were ranked I, II and III respectively.

(b) *Disease control*: The (Table 1) revealed that training needs of the respondents were found most important in the area of 'control of plant diseases' with mean score of (2.21) followed by 'knowledge of chemicals and fungicides' with mean score of (2.20) and 'identification of plant diseases' with mean score of (1.93) and were ranked I, II and III respectively.

Flowering and pollination

Data described in (Table 1) shows that training needs of the respondents in the field of 'knowledge of flowering and

pollination' with a mean score of (1.41) were found to be important.

Table 1 Training needs areas of farmers with respect to improved kiwi farming practices

S. No.	Area of training	Level of training needs			WS	Rank
		Most needed	Needed	Less needed		
A.	Climate and Soil					
i.	Knowledge of climate type appropriate for the crop	15 (14.42)	26 (25.00)	63 (60.5)	1.54	IV
ii.	Knowledge of soil and soil type	30 (28.85)	47 (45.19)	27 (25.96)	2.03	III
iii.	Soil treatment	37 (35.58)	57 (54.81)	10 (9.62)	2.26	II
iv.	Soil management	42 (40.38)	51 (49.04)	11 (10.58)	2.30	I
B.	Propagation and Planting					
i.	Knowledge of planting material	21 (20.19)	57 (54.81)	26 (25.00)	1.95	V
ii.	Varieties	47 (45.19)	49 (47.12)	8 (7.69)	2.36	I
iii.	Method of propagation	11 (10.58)	53 (50.96)	40 (38.46)	1.72	VI
iv.	Time of planting	40 (38.46)	41 (39.42)	23 (22.12)	2.16	II
v.	Spacing (row to row and plant to plant)	36 (34.62)	42 (40.38)	26 (25.00)	2.10	III
vi.	Treatment of planting material	30 (28.85)	47 (45.91)	27 (25.96)	2.03	IV
C.	Land preparation and Layout					
i.	Pit size	7 (6.73)	50 (48.08)	47 (45.19)	1.62	III
ii.	Male to Female ratio (♂:♀)	55 (52.88)	32 (30.77)	17 (16.35)	2.37	II
iii.	Identification / knowledge of male and female plants	54 (51.92)	42 (40.38)	8 (7.69)	2.44	I
iv.	Row orientation (in N-S direction)	8 (7.69)	35 (33.65)	61 (58.65)	1.49	IV
D.	Training and pruning					
i.	Knowledge on training/trailing system	32 (30.77)	46 (44.23)	26 (25.00)	2.06	I
ii.	Time of training and pruning	13 (12.50)	28 (26.92)	63 (60.58)	1.52	III
iii.	No. of training and pruning	29 (27.88)	33 (31.73)	42 (40.38)	1.88	II
E.	Nutrient management					
i.	Recommended dose of FYM	18 (17.31)	54 (51.92)	32 (30.77)	1.87	IV
ii.	Time of application of FYM	21 (20.19)	45 (43.27)	38 (36.54)	1.84	V
iii.	Knowledge of fertilizers and chemicals	32 (30.77)	29 (27.88)	43 (41.35)	1.89	III
iv.	Knowledge of bio-fertilizers	36 (34.62)	51 (49.04)	17 (16.35)	2.18	II
v.	Usage and dosage of bio-fertilizers	38 (36.54)	49 (47.12)	17 (16.35)	2.20	I
F.	Irrigation management					
i.	The appropriate irrigation time interval to be followed	64 (61.54)	32 (30.77)	8 (7.69)	1.46	III
ii.	Method of irrigation system	66 (63.46)	19 (18.27)	19 (18.27)	1.55	II
iii.	Knowledge of critical stages for irrigation	34 (32.69)	45 (43.27)	25 (24.04)	1.91	I
G.	Weed control					
i.	Identification of weeds	26 (25.00)	30 (28.85)	48 (46.15)	1.79	III
ii.	Control of weeds	70 (67.31)	28 (26.92)	6 (5.77)	2.62	I
iii.	Knowledge of weedicides	38 (36.54)	44 (42.31)	22 (21.15)	2.15	II
H.	Plant protection measures					
a.	Insect-pest control					
i.	Identification of insects/pests	29 (27.88)	39 (37.50)	36 (34.62)	1.93	III
ii.	Control of insect/pests	32 (30.77)	60 (57.69)	12 (11.54)	2.19	I
iii.	Knowledge of insecticides	28 (26.92)	50 (48.08)	26 (25.00)	2.02	II
b.	Disease control					
i.	Identification of plant diseases	26 (25.00)	45 (43.27)	33 (31.73)	1.93	III
ii.	Control of plant diseases	39 (37.50)	48 (46.15)	17 (16.35)	2.21	I
iii.	Knowledge of chemicals and fungicides	40 (38.46)	45 (43.27)	19 (18.27)	2.20	II
I.	Flowering and pollination					
i.	Knowledge of flowering and pollination	10 (9.62)	23 (22.12)	71 (68.27)	1.41	I
J.	Harvesting / Storage					
i.	Appropriate time of harvesting	25 (24.04)	32 (30.77)	47 (45.19)	1.79	II
ii.	Method of harvesting	4 (3.85)	33 (31.73)	67 (64.42)	1.39	III
iii.	Method of storage	34 (32.69)	42 (40.38)	28 (26.92)	2.06	I

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K.	Processing and Marketing					
i.	Grading and standardization	34 (32.69)	44 (42.31)	26 (25.00)	2.08	III
ii.	Packaging	32 (30.77)	53 (50.96)	19 (18.27)	2.13	II
iii.	Marketing and market information	56 (53.85)	27 (25.96)	21 (20.19)	2.34	I

Harvesting / Storage

The training need areas perceived as most needed by the respondents were 'method of storage' with mean score of (2.06) followed by 'appropriate time of harvesting' with mean score of (1.79) and 'method of harvesting' with mean score of (1.39) and were ranked I, II and III respectively.

Processing and marketing

The training need areas perceived as most needed by the respondents in the field of 'processing and marketing'

were 'marketing and market information' with mean score of (2.34) followed by 'packaging' with mean score of (2.13) and 'grading and standardization' with mean score of (2.08) and were ranked I, II and III respectively [7].

Data depicted in (Table 2) shows that majority (61.54%) of the kiwi growers had medium level of training needs in relation to improved kiwi farming practices followed by high level of training needs (20.19%) and low (18.27%) level of training needs [8].

Table 2 Distribution of kiwi growers in accordance to their overall training needs scores (n =104)

S. No.	Level of training needs	Score range	Frequency	Percentage
1	Low	Upto 65.06	19	18.27
2	Medium	65.06 to 96.88	64	61.54
3	High	96.88 and above	21	20.19
	Total		104	100.00

$\bar{X}$ = 80.97,   S.D = 15.91

Table 3 Constraints perceived by the kiwi growers

S. No.	Constraints	Frequency	Frequency (%)	Rank
A.	Bio-Physical constraints			
1.	Lack of certified planting material	46	44.23	IV
2.	High cost of planting material	71	68.27	II
3.	Incidence of insect pest and diseases	59	56.73	III
4.	Weed problems	96	92.31	I
5.	Inadequate irrigation facilities	38	36.54	V
B.	Socio-economic constraints			
1.	High cost of inputs	103	99.04	I
2.	Labour scarcity and high labour charge	87	83.65	IV
3.	Non- availability of credit	98	94.23	II
4.	Lack of subsidy for inputs	97	93.27	III
5.	Low market value	65	62.5	V
C.	Technological constraints			
1.	Lack of technical help/less contact with technical expert	24	23.08	VI
2.	Lack of improved irrigation system (Drip irrigation, sprinkler irrigation etc.)	104	100	I
3.	Lack of suitable technology for the region	104	100	I
4.	Technologies are costly and require higher input cost	103	99.04	III
5.	Lack of knowledge of kiwi growing	32	30.77	V
6.	Lack of knowledge of IPM/INM	85	81.37	IV
D.	Institutional constraints			
1.	Lack of marketing	3	2.88	VI
2.	Non-availability of insurance when crop fails	104	100	I
3.	Insufficient training programme	51	49.04	III
4.	Lack of co-ordination with Department of Horticulture, marketing co-operatives and kiwi growers	45	43.27	IV
5.	Shortage of poor extension staff	29	27.88	V
6.	Lack of storage facilities	91	87.5	II

Constraints perceived by the kiwi growers

A general perspective on (Table 3) revealed that weed problems under bio-physical constraints; high cost of inputs

under socio-economic constraints; lack of improved irrigation system and lack of suitable technology for the region under technological constraints; non-availability of insurance when

crop fails under institutional constraints were among the many constraints perceived by the kiwi growers [9].

It was observed that weed problems (92.31%) ranks first under bio-physical constraints followed by high cost of planting material (68.27%), incidence of insect pest and diseases (56.73%), lack of certified planting material (44.23%) and inadequate irrigation facilities (36.54%). Socio-economic constraints high cost of inputs (99.04%) was found to be in the first rank proceeded by non- availability of credit (94.23%), lack of subsidy for inputs (93.27%), labour scarcity and high labour charge (83.65%) and low market value (62.5%). Technological constraints; it was understandable that lack of improved irrigation system (100%) and lack of suitable technology for the region (100%) were the first major constraints under technological constraints, followed by technologies are costly and require higher input cost (99.04%), lack of knowledge of IPM/INM (81.37%), lack of knowledge of kiwi growing (30.77%) and lack of technical help/less contact with technical expert (23.08%) [10]. Institutional constraints revealed that non-availability of insurance when crop fails (100%) ranked the first under institutional constraints, followed by lack of storage facilities (87.5%), insufficient training programme (49.04%), lack of co-ordination with department of horticulture, marketing co-operatives and kiwi growers (43.27%), shortage of poor extension staff (27.88%) and lack of marketing (2.88%).

CONCLUSION

It could be concluded that the response gathered from 104 respondents demonstrated that majority (61.54%) of the respondents had medium level of training needs continued by those under high training needs (20.19%) and those falling under low training needs (18.27%) with regard to kiwi cultivation practices. The top three areas which required training most importantly were weed control having mean score of 2.19, followed by processing and marketing having mean score of 2.18 and plant protection measures (Disease control, Insect-pest control) with mean score of 2.08. The least important training need area was distinguished as flowering and pollination having mean score of 1.41. It is evident from the overall sectoral assessment that kiwi is a vital horticulture crop for lower Subansiri District due to its importance in terms of livelihoods and income generation for the farmers. In addition, there is huge potential for processing of Kiwi in the region, which can give a major boost to the economy of State.

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