

Received : 10.09.2022 | Accepted : 11.11.2022 | Online published : 15.12.2022

[https://doi.org/10.54986/irjee/2022/dec\\_spl/132-136](https://doi.org/10.54986/irjee/2022/dec_spl/132-136)I  
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EXTENSION  
EDUCATION

## RESEARCH ARTICLE

## Training Needs of Kiwi Growers in Subansiri District of Arunachal Pradesh

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### ABSTRACT

*The kiwi fruit is a temperate fruit crop; its cultivation is limited to certain temperate regions. 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 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:** Arunachal Pradesh; Kiwi growers; Traditional training needs.

Agricultural sector in Arunachal Pradesh employs 60 per cent of its workforce and contributes 30% to the gross domestic product (GDP). Amongst north-eastern states, Arunachal Pradesh has largest geographical spread to 8.37 million ha. But only 2.2% of the geographical area is arable. Average size of landholding is 3.52 ha, more than thrice of the all-India average (Mani *et al.* 2018). The total area under horticulture is about 0.12 million hectares with production of 0.6 million tonnes (Yadav and Shalendra, 2018). Temperate fruits occupy a significant place in horticultural wealth of the country. They constitute about 12-13 per cent of the total area and 6-8 per cent total production under the fruits in the country. Among the temperate fruits, apple, pear, peach, plum, apricot, cherry, almond, kiwifruit, persimmon, walnut and pecan nut are mainly cultivated in hills of north-western Himalayan (Mittra *et al.* 1991). 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 (Anon). 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. Lynton and Pareek (1990) stated that training consists largely of well-organized opportunities for participants to acquire necessary understanding and skill. Training provides a systematic improvement of knowledge and skills which in turn helps the trainees to function effectively and efficiently in their given task on completion of the training (Sajeew and Singha, 2010). Transfer of technology through training has become a common and major extension activity in the field of agriculture (Sharma *et al.* 2014). The present study was conducted with following specific objectives: (i) to study the socio-personal of the kiwi growers (ii) to assess the training needs of the kiwi growers.

### METHODOLOGY

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. The data were collected using structured interview schedule and were then analyzed using appropriate statistical tools viz. frequency, percentage, mean, standard deviation, simple correlation and multiple regression.

The farmer's responses were collected in 3 – point continuum scale such as most needed (MN), needed (N) and less needed (LN) by assigning scores 3, 2 and 1, respectively. The results were calculated as weighted score (WS) for each of the thrust area identified for the training as per following formula.

$$WS = \frac{MN \times 3 + N \times 2 + LN \times 1}{\text{Total No. of MN} + n + LN} \times 100$$

Weighted Scores in the range of 2 – 3 were ranked within each areas and area of training need were ranked based on weighted score.

## RESULTS AND DISCUSSION

The data in Table 1 revealed that maximum of the respondents belonged to middle aged group (60.58%) followed by old aged group (22.12%) and young aged group (17.31%). Majority (61.54%) of the respondents studied up to higher secondary and above, followed by high school (18.27%), primary school (6.73%), middle school (5.77%), illiterate (4.81%), can read and write (1.92%) and can read only (0.96%). Dominant parts of the respondents (75.96%) were living under a nuclear family. Majority of the respondents were under a nuclear family (75.96%) as one move out of their parent's home after getting married.

It is clear from Table 1 that the percentage of respondents with a small family (52.88%) was slightly higher than those with a large family (47.12%). The reasons for finding a greater number of small families could be their awareness, education and greater exposure to the external world. A general perspective on Table 1 depicted that dominant part of the respondents (55.77%) had medium land holding followed by large land holding (24.04%), small land holding category

(14.42%) and marginal land holding (5.77%). It was observed that the most of the respondents belonged to medium income group (62.50%). The conceivable explanation may be that in addition to agriculture, the kiwi growers have other sources of income. The term 'training exposure' was operationalized as the number of days one had attended training programmes irrespective of its kind/type during the last five years. It was observed from Table 1 that the majority of the respondents had medium training exposure (66.34%), followed by those with low training exposure (23.08%) and high training exposure (10.58%). Majority of the respondents (65.39%) belonged to the medium risk orientation. Majority of the respondents were under medium innovation proneness category (85.58%) category. Majority of the respondents were falling under medium innovation proneness category. It was noticed from Table 1 that the category of medium economic motivation exhibited the highest percentage (61.54%) category of economic motivation. It was observed that majority of the respondents (70.19%) were having medium level of extension contact followed by low level (16.35%) and high level (13.46%) of extension contact. Highest percentage of the respondents (69.23%) had medium level of mass media exposure followed by the respondents falling under low mass media exposure category (17.31%) and the respondents falling under high mass media exposure category (13.46%).

*Training needs assessment in relation to improved package of practices of kiwi cultivation:* Table 2 revealed that training needs related climate and soil, based on weighted mean score were soil management (2.30), followed by soil treatment (2.26), knowledge of soil and soil type (2.03), knowledge of climate type appropriate for the crop (1.54) and they were ranked I, II, III, IV, respectively. Further, training needs related propagation and planting, sub area varieties (2.36) ranked I followed by time of planting (2.16), spacing (row to row and plant to plant) (2.10), treatment of planting material (2.03) and were ranked II, III, IV respectively. With respect to land preparation and layout training need in sub area identification knowledge of male and female plants (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) were ranked I, II, III and IV, respectively. In training and pruning, training need areas perceived as most needed by the respondent's knowledge on training/trailing system (2.06), followed by 'no. of

**Table 1. Personal characteristics of the kiwi growers**

Independent variables	No.	%
<i>Age</i>		
Young (<43 years)	18	17.31
Middle age (43-61 years)	63	60.58
Old age (61 years and above)	23	22.11
<i>Educational status</i>		
Illiterate	5	04.81
Can Read Only	1	0.96
Can Read And Write	2	01.92
Primary School(up to class V)	7	06.73
Middle School(up to class VIII)	6	05.77
High School (up to class X)	19	18.27
Higher Secondary And Above	64	61.54
<i>Family type</i>		
Nuclear	79	75.96
Joint	25	24.04
<i>Family size</i>		
Small (1-5 members)	55	52.88
Large (6 and above)	49	47.12
<i>Land holding</i>		
Marginal (less than 1 ha)	6	05.77
Small (1-2 ha)	15	14.42
Medium ( 2-4 ha)	58	55.77
Large (4 ha and above)	25	24.04
<i>Annual income</i>		
Low (< 313)	19	18.27
Medium (313 – 683)	65	62.50
High ( $\geq$ 683)	20	19.23
<i>Training exposure</i>		
Low (< Mean-SD)	24	23.08
Medium (between Mean $\pm$ S.D)	69	66.34
High (> Mean+SD)	11	10.58
<i>Risk orientation</i>		
Low (< Mean-SD)	21	20.19
Medium (between Mean $\pm$ S.D)	68	65.39
High (> Mean+SD)	15	14.42
<i>Innovation proneness</i>		
Low (< Mean-SD)	5	04.81
Medium (between Mean $\pm$ S.D)	89	85.58
High (> Mean+SD)	10	9.61
<i>Economic motivation</i>		
Low (< Mean-SD)	19	18.27
Medium (between Mean $\pm$ S.D)	64	61.54
High (> Mean+SD)	21	20.19
<i>Extension contacts</i>		
Low (< Mean-SD)	17	16.35
Medium (between Mean $\pm$ S.D)	73	70.19
High (> Mean+SD)	14	13.46
<i>Mass media exposure</i>		
Low (< Mean-SD)	18	17.31
Medium (between Mean $\pm$ S.D)	72	69.23
High (> Mean+SD)	14	13.46

training and pruning (1.88) and time of training and pruning (1.52). Nutrient management related training need indicated that usage and dosage of bio-fertilizers (2.20), knowledge of bio-fertilizers (2.18), knowledge of fertilizers and chemicals (1.89), recommended

dose of FYM (1.87) and time of application of FYM (1.84) were ranked I, II, III, IV and V, respectively. In case of irrigation management, 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, training needs of the respondents found control of weeds followed by knowledge of weedicides and identification of weeds and were ranked I, II and III respectively. Plant protection measures including Insect-pest control revealed that training needs of the respondents were control of insect/pests followed by knowledge of insecticides and identification of insects/pests, respectively. Plant protection measures including disease control revealed that control of plant diseases (2.21) followed by knowledge of chemicals and fungicides (2.20) and identification of plant diseases (1.93) and were ranked I, II and III respectively. Training related to flowering and pollination includes knowledge of flowering and pollination is important. In case of harvesting/Storage management training need areas perceived by the respondents were method of storage (2.06) followed by appropriate time of harvesting (1.79) and method of harvesting (1.39) and were ranked I, II and III, respectively. The areas perceived as most needed training in the field of processing and marketing were marketing and market information followed by packaging and grading and standardization and were ranked I, II and III, respectively.

Table 3 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. The similar finding was also reported by *Chawang and Jha, 2010* in their study on training need of paddy cultivators in Nagaland.

For ascertaining the relationship correlation coefficient was calculated as depicted in Table 2. Out of the twelve independent variables, eight were found to have positive and significant. They were age, educational status, size of land holding, annual income, training exposure, innovation proneness, economic motivation, extension contact, mass media exposure whereas training exposure, innovation proneness, economic motivation, extension contact, mass media exposure was negatively correlated. However, the remaining three variables viz. family type, family size and risk orientation showed non-significant relationship with attributes of the kiwi growers with their training needs assessment.

**Table 2. Training need areas of farmers with respect to improved kiwi farming practices (N=104)**

Area of Training	Most Needed	Needed	Less Needed	WS	Rank
<i>Climate and Soil</i>					
Knowledge of climate type appropriate for crop	15(14.42)	26(25.00)	63(60.5)	1.54	IV
Knowledge of soil and soil type	30(28.85)	47(45.19)	27(25.96)	2.03	III
Soil treatment	37(35.58)	57(54.81)	10(9.62)	2.26	II
Soil management	42(40.38)	51(49.04)	11(10.58)	2.30	I
<i>Propagation and planting</i>					
Knowledge of planting material	21(20.19)	57(54.81)	26(25.00)	1.95	V
Varieties	47(45.19)	49(47.12)	8(7.69)	2.36	I
Method of propagation	11(10.58)	53(50.96)	40(38.46)	1.72	VI
Time of planting	40(38.46)	41(39.42)	23(22.12)	2.16	II
Spacing	36(34.62)	42(40.38)	26(25.00)	2.10	III
Treatment of planting material	30(28.85)	47(45.91)	27(25.96)	2.03	IV
<i>Land preparation and layout</i>					
Pit size	7(6.73)	50(48.08)	47(45.19)	1.62	III
Male-female ratio	55(52.88)	32(30.77)	17(16.35)	2.37	II
Identification of male and female plants	54(51.92)	42(40.38)	8(7.69)	2.44	I
Row orientation (in N-S direction)	8(7.69)	35(33.65)	61(58.65)	1.49	IV
<i>Training and pruning</i>					
Knowledge on training/trailing system	32(30.77)	46(44.23)	26(25.00)	2.06	I
Time of training and pruning	13(12.50)	28(26.92)	63(60.58)	1.52	III
No. of training and pruning	29(27.88)	33(31.73)	42 (40.38)	1.88	II
<i>Nutrient management</i>					
Recommended dose of FYM	18(17.31)	54(51.92)	32(30.77)	1.87	IV
Time of application of FYM	21(20.19)	45(43.27)	38(36.54)	1.84	V
Knowledge of fertilizers and chemicals	32(30.77)	29(27.88)	43(41.35)	1.89	III
Knowledge of bio-fertilizers	36(34.62)	51(49.04)	17(16.35)	2.18	II
Usage and dosage of bio-fertilizers	38(36.54)	49(47.12)	17(16.35)	2.20	I
<i>Irrigation management</i>					
The appropriate irrigation time interval	64(61.54)	32(30.77)	8(7.69)	1.46	III
Method of irrigation system	66(63.46)	19(18.27)	19(18.27)	1.55	II
Knowledge of critical stages for irrigation	34(32.69)	45(43.27)	25(24.04)	1.91	I
<i>Weed control</i>					
Identification of weeds	26(25.00)	30(28.85)	48(46.15)	1.79	III
Control of weeds	70(67.31)	28(26.92)	6(5.77)	2.62	I
Knowledge of weedicides	38(36.54)	44(42.31)	22(21.15)	2.15	II
<i>Insect-pest control</i>					
Identification of insects/pests	29(27.88)	39(37.50)	36(34.62)	1.93	III
Control of insect/pests	32(30.77)	60(57.69)	12(11.54)	2.19	I
Knowledge of insecticides	28(26.92)	50(48.08)	26(25.00)	2.02	II
<i>Disease control</i>					
Identification of diseases	26(25.00)	45(43.27)	33(31.73)	1.93	III
Control of plant diseases	39(37.50)	48(46.15)	17(16.35)	2.21	I
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
<i>Harvesting/storage</i>					
Appropriate time of harvesting	25(24.04)	32(30.77)	47(45.19)	1.79	II
<i>Harvesting Method</i>					
Method of storage	4(3.85)	33(31.73)	67(64.42)	1.39	III
Method of storage	34(32.69)	42(40.38)	28(26.92)	2.06	I
<i>Processing and marketing</i>					
Grading and standardization	34(32.69)	44(42.31)	26(25.00)	2.08	III
Packaging	32(30.77)	53(50.96)	19(18.27)	2.13	II
Marketing information	56(53.85)	27(25.96)	21(20.19)	2.34	I



**Table 3. Distribution of kiwi growers in accordance to their overall training needs (N=104)**

Level of training needs	No.	%
Low (<65.06)	19	18.27
Medium (65.06 to 96.88)	64	61.54
High (96.88 and <)	21	20.19
Total	104	100.00
Mean=80.97, S.D = 15.91		

**Table 4. Correlation coefficient of personal attributes of the kiwi growers with their training needs (N=104)**

Independent variable	'r'
Age	-0.557**
Educational status	0.303**
Family type	0.066 <sup>NS</sup>
Family size	-0.119 <sup>NS</sup>
Size of land holding	0.381**
Annual income	0.215*
Training exposure	-0.613**
Risk orientation	0.003 <sup>NS</sup>
Innovation proneness	0.194*
Economic motivation	-0.335**
Extension contacts	-0.241*
Mass media exposure	-0.261**

\*\*Significant at the 0.01 level (2-tailed).

\*Significant at the 0.05 level (2-tailed). NS- Non-significant

**Table 5. Regression analysis of extent of training needs assessment with independent variables**

Variables	B	S. E	$\beta$	t-value	Sig.
Age	-.018	.023	-.424	-5.520**	.000
Education	-.032	.024	.023	-1.384	.170
Land size	.077	.020	.264	3.757**	.000
Annual income	.000	.000	-.221	-2.935**	.004
Training exposure	-.027	.006	-.478	-4.414**	.000
Innovation proneness	.049	.025	.126	1.923*	.057
Economic motivation	-.015	.011	-.100	-1.329	.187
Extension contact	.012	.009	.106	1.416	.160
Mass media exposure	-.011	.010	-.096	-1.152	.252
R=0.786	R <sup>2</sup> = 0.618		F=16.897**		

\*\*Significant at 0.01 level of significance

\*Significant at 0.05 level of significance

The findings of the regression analysis were presented in Table 5. It was observed that age, annual income, training exposure was found positively significant while land holding and innovation proneness was found negatively significant. Also, educational status, economic motivation, extension contact and mass media exposure were found non- significant. The R<sup>2</sup> value (0.618) from the all variables jointly contributed (61.80%) towards the training needs assessment of the

kiwi growers. The calculated F-value (16.897) was also found significant. This indicated the significant effectiveness of the independent variables in predicting the extent of training needs assessment of the kiwi growers when all the variables are functioning mutually.

## CONCLUSION

It was found that kiwi farmers had medium level of training needs. This study also identified specific training needs of the kiwi farmers of Arunachal Pradesh such as weed control, processing and marketing, plant protection measures, propagation and planting. It can be resolved that there was a necessity to transmit scientific know-how to the farmers through appropriate and timely training in order to improve their information and awareness concerning improved kiwi production technology to intensify the production and productivity. It will help in raising their socio-economic level. Major constraints faced by the kiwi growers need be taken into consideration to resolve it for the future cause.

## CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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