Analysis of adoption of recommended cultivation practices by lime growers of north Karnataka

■ **Jameer R. Attar and S. G. Aski**

Correspondence to :

S.G. Aski
Department of Agricultural
Extension Education,
College of Agriculture,
University of Agricultural
Sciences, **Dharwad
(Karnataka) India**

ABSTRACT : Fruits are of great importance in the field of human nutrition. Citrus is one of the most important fruit crop in India. Citrus fruits have a special place in Indian diet as they are rich source of vitamin C, vitamin A, vitamin B and fruit sugars. The present investigation was conducted in Vijayapura and Kalaburagi district of Northern Karnataka in the year 2013-14. A sample size of 140 respondents who have minimum one acre of lime orchard and who have at least five years and above old orchard were selected randomly. The data was collected through personal interview method with the help of structured interview schedule. The results indicates that, comparatively more number (42.14 %) of farmers belonged to medium adoption category, followed by high (34.29 %) and low (23.57 %) adoption category. It was also observed that, education, land holding, annual income, extension contact, mass media participation, experience in lime cultivation and economic motivation found to have positive and significant relationship with the adoption level of lime growers.

KEY **W**ORDS **:** Adoption, Citrus fruits, Lime growers

INTRODUCTION :

Agriculture is the mainstay of lively hood for human civilization across the world. India, where millions of people reside in villages, is mainly depending on agriculture. Today, Indian agriculture contributes more than 22 per cent of GDP and provides direct livelihood to 59 per cent of the labour force. It has been estimated that 75 per cent of Indian population below the poverty line lives in rural areas, is directly or indirectly dependent on agriculture. There has been a tremendous progress in agriculture from few decades in the country. However, due to the increased availability of staple cereals at declining real prices, farmers have taken a move towards the economic crops like fruits, vegetables, medicinal plants,

etc. from less resource generating food grain. Therefore, fruit cultivation has emerged as an important enterprise for farming community and many farmers adopted it as a main source of the family income. Fruits have great importance in human diet. It is stated that standard of living of the people of a country can be judged by its production and per capita consumption in the world. India is the second largest producer of fruits in the world. Although India may unable to cater the nutritional demands of even increasing per capita availability of fruits in the country is 46 g per day against 92 g per day recommended by Indian council of medical research. This may be due to very low production and increasing population pressure of the country. Obviously, there is an urgent need for increasing the production of fruits in the country. To cope

up with this situation our research scientists, extension worker and farmers have great responsibility to maximize the production of fruits. The production of arid fruits

Citrus fruits have a prominent place among popular and extensively grown tropical and sub-tropical fruits. Citrus fruits possess greater adoptability to different climatic conditions. Lime provides vitamins (vit-C) minerals and many other essential substance which are required for human health. In our country, Kagzi lime (*Citrus aurantifolia* Swingle) is cultivated extensively on commercial scale and is more popular than lemon. Bijapur in Karnataka is major lime growing district with an area of 1600 ha producing 24000 t. It is yet to exploit its potentiality for growing lime in extensive scale. The average yield per plant is 800 fruits, which is very less compared to the estimated yield of 1000-2000 fruits per plant per year. So, there is lot of scope for increasing the production of lime by increasing.

MATERIALS AND METHODS :

In the present investigation, *Ex-post-facto* research design was used. The study was conducted in the purposively selected Vijayapura and Kalaburagi district of Northern Karnataka in the year 2013-14 on basis of largest cultivated area under lime (Anonymous, 2014a). Among the five taluks of Vijayapura district, Indi taluk had the maximum area under lime (3564 ha) followed by Vijayapura (1464 ha) taluk (Anonymous, 2014b). Similarly Among seven taluks of Kalaburagi district, Afzalpur taluk (315 ha) had maximum area followed by Aland (235ha) taluka (Anonymous, 2014b). Hence, Indi taluk in Vijayapura district and Afzalpur taluk from Kalaburagi district were purposively selected for the study. The list of villages having highest area and production in the Taluk was obtained from the Department of Horticulture and villages having highest area and production were selected for the study. From each taluk seven villages were selected and from each village 10 Lime growers who have minimum one acre of lime orchard and who have at least five years and above old orchard were selected randomly. Thus, the total sample size of the respondents is 140 for the study.

The purpose of fixing the criteria of five years and above old orchard was that the Lime requires more than five years to harvest good crop, so in five years one can harvest at least one crop which facilitates to study the knowledge and adoption of Lime grower.

The data were collected by using pre-structured schedule prepared in consultation with scientists of University and State Department of Horticulture. The data were analysed by using suitable statistical tools frequency, percentage and correlation co-efficient. On this background, it will be more appropriate to understand the multi-dimensional behaviour of farmers to induce adoption of recommended cultivation practices by large majority of farmers on a large scale and in a sustained manner. But the research studies which throw light on the existing cultivation pattern of lime and relation of socio-economic characteristics with adoption of recommended cultivation practices particularly in Bijapur and kalaburgi district of North Karnataka state.

RESULTS AND DATA ANALYSIS :

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Adoption of recommended cultivation practices of lime:
Distribution of respondents based on adoption of individual recommended cultivation practices of lime: Adoption of individual recommended cultivation practices of lime:

The results presented in Table 1 depict the adoption of individual recommended cultivation practices by lime growers.

Selection of lime varieties:
It was observed from Table 1 that, cent per cent of lime growers adopted recommended variety of Kagzi lime.

Suitable soil, plant spacing and ideal size of the pits for planting :
The data furnished in Table 1 indicates that, cent per cent of farmers fully adopted the Kagzi lime and suitable soil of loam and sandy loam. While, 66.42 and 61.43 per cent of farmers fully adopted inter and intra row spacing of 6 m x 6 m and recommended pit size of 75 cm x 75 cm x 75 cm, respectively.

Fertilizer management:
The results with respect to fertilizer management indicates that, majority (65.00 %) of farmers fully adopted

recommended application of FYM dose per ha *i.e.* 8.40 t/ha/year. Whereas, 69.28 per cent farmers not adopted recommended chemical fertilizer application *i.e.* N: 138 kg/ha, P: 83 kg/ha, K: 138 kg/ha.

Irrigation system:

The recommended method of drip irrigation system was fully adopted by majority (69.29 %) of the lime growers.

Major diseases control measures:

A cursory look in to the Table 1 reveals that, 67.86 and 83.57 per cent of the lime growers partially adopted the recommended chemicals and concentration, respectively.

Pest and disease management:

It was observed from Table 1 indicated that, 60.00 and 73.58 per cent of lime growers have adopted the control measures like usage of Carbaryl and NSKE against the pest usage of recommended concentration of Carbaryl and NSKE for application, respectively.

Harvesting of lime:

An equal cent per cent of the lime growers have adopted, ideal stage of harvesting (dark green to yellow) and method of harvesting (handpicking).

The data furnished in Table 1 indicates that, cent per cent of farmers fully adopted the practices such as, use of Kagzi lime variety, planting in suitable soil of loam and sandy loam, ideal stage of harvesting *i.e.* dark green to yellow stage, handpicking method of harvesting. Further, majority (69.29%) of farmers used drip irrigation method followed inter and intra row spacing of 6 m x 6 m and pit size of 75 cm x 75 cm x 75 cm. This might be due to the fact that, majority of the farmers expressed during the survey that these were the very important practices which were contributing for increasing yield and quality of fruits.

Further, it was noticed that, majority of the respondents partially adopted the practices like use of chemical against diseases (67.86 %), use of chemicals

| Sr. No. | Practices | Level of adoption | | |
| | | Fully adopted | Partially adopted | Not adopted |
		Frequency (%)	Frequency (%)	Frequency (%)
1.	Adoption of Kagzi lime variety	140 (100.00)	00 (0.00)	00 (0.00)
2.	Suitable soil (Loam and Sandy loam)	140 (100.00)	00 (0.00)	00 (0.00)
3.	Inter row and intra row spacing of 6 m x 6 m	93 (66.42)	47 (33.58)	00 (0.00)
4.	Pit size followed (75 cm x 75 cm x75 cm)	86 (61.43)	54 (38.57)	00 (0.00)
5.	Fertilizer management			
	Organic fertilizers (FYM 8.4t/ha/year)	91 (65.00)	49 (35.00)	00 (0.00)
	Chemical fertilizers (N:P:K: 138 kg/ha:83 kg/ha:138 kg/ha	17 (12.15)	26 (18.57)	97 (69.28)
6.	Irrigation system: Drip irrigation	97 (69.29)	00 (0.00)	43 (30.71)
7.	Major diseases control measures (Citrus canker disease, Die back disease)			
	Chemicals:	45 (32.14)	95 (67.86)	00 (0.00)
	Citrus canker: Bordeaux mixture; Die back: Carbondizim			
	Concentration:			
	Recommended concentration : 10 g @ 1 %/1 ltr. water: 1g/ ltr. water	23 (16.43)	117 (83.57)	00 (0.00)
8.	Control of pests (Citrus butterfly: Leaf minor)			
	Chemicals			
	Citrus butterfly : Carboryl; Leaf minor : NSKE	56 (40.00)	84 (60.00)	00 (0.00)
	Concentration			
	Recommended Concentration: 4g 50 WP/1 ltr. water@ 5 %; 50 ml/ltr. water	37 (26.42)	103 (73.58)	00 (0.00)
9.	Harvesting of lime			
	Harvesting the lime during dark green / yellow stage of the fruit	140 (100.00)	00 (0.00)	00 (0.00)
	Harvesting the lime by using fruit plucker /handpicking	140 (100.00)	00 (0.00)	00 (0.00)

Table 1: Distribution of respondents based on adoption of individual recommended cultivation practices of lime (n = 140)

Figures in parentheses indicates percentage

Table 2 : Distribution of respondents based on the overall adoption level of the recommended cultivation practices of lime (n=140)

Sr. No.	Category	Frequency	Percentage
1.	Low (<12.64)	33	23.57
2.	Medium (12.64-14.50)	59	42.14
3.	High (>14.50)	48	34.29
	Mean = 13.57 SD = 2.18		

Table 3: Relationship between personal and socio-economic characteristics of lime growers with their adoption level (n=140)

Sr. No.	Variables	Correlation
1.	Age	0.027
2.	Education	0.256**
3.	Family size	0.031
4.	Land holding	0.177*
5.	Annual income	0.217**
6.	Extension contact	0.145*
7.	Mass media participation	0.164*
8.	Experience in lime cultivation	0.239**
9.	Economic motivation	0.183*
10.	Organization participation	0.098

* and ** indicate significance of values at P=0.05 and 0.01, respectively

against diseases in recommended concentration (83.57 %), use of chemicals against pests (60.00 %), use of chemical against pest in recommended concentration (73.58 %). Whereas, it is also observed that, 69.28 per cent of lime growers not adopted the usage of chemical fertilizers. It is due to the reason that, lime growers were in the notion that, use of chemicals and chemical fertilizers reduces the age of the plants and also keeping quality of fruits hence they tend to not to use the chemical fertilizers. Similar results were reported by Birajdar (1999) and Gotyal *et al.* (2011).

Distribution of respondents based on the overall adoption level of the recommended cultivation practices of lime :

The data presented in Table 2 indicates that, comparatively more number (42.14 %) of farmers belonged to medium adoption category, followed by high (34.29 %) and low (23.57 %) adoption category.

This might be due to the reason that lime being traditionally grown in this area and farmers were well versed with many of the cultivation practices and it is one of the best suited commercial fruit crop in hot climate conditions and less risky crop, hence majority of the farmers belonged to medium adoption category. The results are in conformity with Gotyal *et al.* (2011).

Correlation co-efficient of profile of respondents with extent of adoption of recommended lime cultivation practices by lime growers:

It could be observed from the results in Table 3 that, out of ten variables selected for the study seven variables namely variables *viz.*, education, land holding, annual income, extension contact, mass media participation, experience in lime cultivation and economic motivation found to have positive and significant relationship with the adoption level of lime growers. Whereas age, family size and organization participation showed no significant relationship with the adoption level of lime growers. Similar findings were reported by Gomase *et al.* (1998), Gotyal *et al.* (2011) and Katole *et al.* (2013).

Authors' affiliations:
Jameer R. Attar, Department of Agricultural Extension Education, College of Agriculture (U.A.S.) **Vijayapur (Karnataka) India**

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