ADOPTION BEHAVIOUR OF KAGZI LIME GROWERS

THESIS

Submitted to the
Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola
in partial fulfillment of the requirements
for the Degree of

MASTER OF SCIENCE
IN
AGRICULTURE
(EXTENSION EDUCATION)

BY
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DECLARATION OF STUDENT

I hereby declare that the experimental work and its interpretation of the Thesis entitled **"ADOPTION BEHAVIOUR OF KAGZI LIME GROWERS"** or part there of has neither been submitted for any other degree or diploma of any University, nor the data have been derived from any thesis / publication of any University or scientific organization. The source of materials used and all assistance received during the course of investigation have been duly acknowledged.

Place : Akola.

Date : 10 /06/2013

(CHAVAN SHUBHANGI RAMSINGH)

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CERTIFICATE

This is to certify that the thesis entitled **"ADOPTION BEHAVIOUR OF KAGZI LIME GROWERS"** submitted in partial fulfillment of the requirement for the degree of **"Master of Science In Agriculture (Extension Education)"** of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola is a record of bonafide research work carried out by **CHAVAN SHUBHANGI RAMSINGH** under my guidance and supervision.

The subject of thesis has been approved by the Student's Advisory Committee.

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Date : 10/06/2013

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THESIS APPROVED BY THE STUDENT'S ADVISORY COMMITTEE INCLUDING EXTERNAL EXAMINER (AFTER VIVA–VOCE)

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(Chavan Shubhangi Ramsingh)
Enrollment. EE/772

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(A) List of Tables

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(D) Abbreviations

%	-	Per cent
Agri.	-	Agriculture
Agril.	-	Agricultural
Dr.PDKV	-	Dr. Panjabrao Deshmukh Krishi Vidyapeeth,Akola
Educ.	-	Education
et al.	-	Et alia (and others)
etc.	-	Et cetra
Extn.	-	Extension
Fig.	-	Figure
g	-	Gram
ha	-	Hectare
i.e.	-	that is
J.	-	Journal
KVK	-	Krishi Vidnyan Kendra
MT	-	metric tonnes
M ha	-	million hectares
NGO's	-	Non Government organizations
M. S.	-	Maharashtra State
No.	-	Number (s)
Res.	-	Research
Rs./	-	Rupees
Sr. No.	-	Serial number
Std.	-	Standard
Unpub.	-	Unpublished
Univ.	-	University
viz.,	-	Videlicet (Namely)

(F) THESIS ABSTRACT

a)	**Title of the thesis**	: **ADOPTION BEHAVIOUR OF KAGZI LIME GROWERS**
b)	**Full name of student**	: **CHAVAN SHUBHANGI RAMSINGH**
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ABSTRACT

The study entitled, "Adoption behavior of kagzi lime growers" was purposively conducted in three Panchayat Samities of Akola district. For present study 120 respondents were selected from 12 villages. The objectives selected for the study are as follows,

1) To study the profile of Kagzi lime growers.
2) To study the adoption behavior of Kagzi lime growers about recommended cultivation practices of Kagzi lime.
3) To study the relationship between selected characteristics of the farmers with their adoption behavior about cultivation practices of Kagzi lime.
4) To study the constraints in adoption of Kagzi lime cultivation practices.

An exploratory research design was adopted for the study. The data were collected by personal interview with the help of pretested and well-structured interview schedule subjected to appropriate statistical analysis. The present study on adoption behavior of kagzi lime cultivation practices by farmers was undertaken in Akola district of Vidarbha region of Maharashtra state with sample size of 120 farmers from 10 villages. Data were collected on personal, socio-economic and psychological characteristics of the respondents.

The findings indicated that, maximum number of the respondents were in middle age group, educated up to high school level, possessed semi-medium land holding, maximum number of respondents were having area under kagzi lime up to 1.5 ha, annual income ranging from Rs. 2,00,001 to Rs. 4,00,000. Majority of the respondents had medium of experience in kagzi lime cultivation, the Innovativeness, risk preference and extension contact and sources of information of the respondents were also observed at medium level.

With regards to knowledge of kagzi lime growers, majority of them were observed in medium knowledge level of kagzi lime cultivation practices, and favorable attitude towards kagzi lime cultivation practices.

As far as adoption is concerned, majority of kagzi lime growers were observed in medium level of adoption of kagzi lime cultivation practices and adoption behavior of kagzi lime growers were also observed at medium level.

The reasons for medium adoption behavior were the medium adoption in major operations and low benefits from kagzi lime cultivation may be due to high wages of labour, timely non availability of labours, not getting remunerative price of kagzi lime fruit, inadequate sources of finance, fluctuation in market, adverse climatic condition, short of capital, etc.

As regards, existence of medium adoption behaviour in manures and fertilizer practices it may be because of non availability of good quality FYM, high cost of FYM, inadequate and timely availability of fertilizers, high cost of fertilizers, pesticides, fungicides and micronutrient. Shortage of irrigation water during summer, were also one of the reasons of the medium adoption behaviour.

The selected characteristics of kagzi lime growers viz., education, land holding and sources of information significantly correlated with the adoption behaviour at 0.05 level of probability.

The variables such as area under kagzi lime cultivation, annual income and experience in kagzi lime cultivation were positively and significantly correlated with adoption behaviour at 0.01 level of probability. The selected variables under study, jointly explain a significant amount of variation in adoption behaviour of kagzi lime growers in kagzi lime cultivation.

CHAPTER I

INTRODUCTION

1.1 Background information

Kagzi limes *(Citrus aurantifolia Swingle)* are believed to have originated from south-east Asia. In India, Kagzi lime is grown commercially in states viz. Maharashtra, Andhra Pradesh, Karnataka, Gujarat, Rajsthan, Orissa, Jharkhand and Tamil Nadu. In Maharashtra, Beed, Parbhani, Osmanabad, Jalna, Aurangabad, Ahmadnagar, Pune, Solapur, Jalgaon, Buldhana and Akola districts are under a Kagzi lime cultivation. Kagzi lime in India, is one of the most predominant lime cultivars of commercial importance. Improved varieties of Kagzi lime viz. Pramalini, Vikram, Sai Sarbati, Phule Sarbati and Balaji have been introduced in Maharashtra state. The fruits of Kagzi lime are available at throw-away prices due to glut in the market in the months of August and September. However the fruit is valued not only for its nutritional and medicinal qualities but also extensively used for the preparation of value added products like squash, syrups, cordials, manufacture of citric acid, pickles, neutraceutical, cosmetic uses and for culinary uses in the daily diet of Indians. The area under citrus in India is 8.6 lakh ha. with production of 78.74 lakh million tons of fresh fruit, of which 34 per cent sweet Orange(Mosambi), 26 per cent mandarin(Santra), 34 per cent is acid lime and 5 per cent tangerine, lemon and grapefruit. In India, the Kagzi lime is mainly cultivated in arid and semi-arid climate. The cultivation of Kagzi lime fruit is in 3.16 lakh ha. area with the production of 25.71 lakh tons with productivity of 8.14 Mt./ha. in India. In Maharashtra state, Kagzi lime area is 53,800 ha. with 2,69,,000 Mt. production. In Akola district the area under Kagzi lime is 2024 ha, production is 12144 million tones and productivity is 60 q/ha. Thus, it was indicated that Kagzi lime is one of the most economically important fruit crop of Vidarbha region next to Mandarin.

Kagzi lime occupies a prime position among fruits due to its high remunerative prices, regular income and regular demand in the market. It is commonly grown all over India. Citrus occupies an important place in horticultural wealth and economy of India as third largest fruit industry after

mango and banana, occupies about 9 per cent of total land under various fruits in India. The value addition to fresh fruits in terms of nutrition, economics and convenience for handling, transportation, storage and consumption definitely has an edge over fresh product. The average returns from the export of processed fruits are more than that of fresh produce. The production of large amounts of value added and processed products dictate evolution of a significant by-products industry to utilize the peel residues, essential oils and other components as well as a search for new products and uses.

Kagzi lime is popular citrus species, which rank third after mandarin and sweet Orange in India. They are cultivated more extensively throughout the India. These crops can also be grown in the marginal lands, hence, are favourite of the poor farmers. The fruits withstand with rough handlings and store longer after harvest, and thus, are better than mandarin and sweet Orange from processing point of view.

Kagzi lime belongs to tropical regions, the trees of Kagzi lime are susceptible to frost damage and hence not grown in frost prone areas. Warm and dry climate is suitable while humid climate with high rainfall increases problem of bacterial canker. The Kagzi limes have thinner peel,are more acidic (7-8%) and are smaller in size and they are susceptible to canker.

In India, Kagzi lime is grown from many years in areas of scarcity zone, where protective irrigation is given through well and also grown mainly by small and marginal farmers with land holding of two acres. The important Kagzi lime growing countries are Italy, United States, Mexico, Brazil, Spain, China, Turkey, Iran and Argentina etc. Of these, Italy and Mexico are the leading countries. India stands fourth in Kagzi lime growing.

Acid lime *(Citrus aurantifolia Swigle)* is known as "Kagzi lime" and more priced than lemon in India. It is propagated by seedling. Fruiting of Kagzi lime is obtained continuously throughout the year. About 1000 to 1400 fruits per plant are obtained in each bahar on full grown tree. Farmers of Vidarbha region generally recommend Ambia and mrig bahar for acid lime production and it is observed that, they did not get a higher prices for their produce from these bahar. It is, therefore, necessary to force their trees for hasta bahar by

applying different growth regulators/regulators to get higher price for their produce.

Processing industries have a special place in view of serious transport and communication bottleneck. High degree of perishablility of certain fruit, particularly those locally produced, grown in abundance in the remote and inaccessible centre of region warrant scientific post harvest management and processing to contribute to high value of product. Proper marketing arrangement for fresh horticultural produce fail to provide practical solution of disposal of entire produce. To this, one may add the marketable surplus in shape of low grade produce, over ripe and under ripe fruits. Windfall and drops and bulky produce which was kept for processing in order to avoid spoilage and accompanied by economical losses.

Therefore, there is a need for reducing the post harvest losses in order to increase the quantity and quality of food supply system. So there is great chance to enhance the horticultural industry in country.

1.2 Need and importance of study

Kagzi lime is equally important is one of the most predominant lime cultivars of commercial importance. The area under citrus in India is 8.6 lakh ha. with production of 78.74 lakh million tons of fresh fruit, of which 34 percent sweet Orange(Mosambi), 26 per cent mandarin(Santra), 34 percent is acid lime and 5 per cent citron, tangerine, lemon and grapefruit. In India the Kagzi lime is mainly cultivated in arid and semi-arid climate. The cultivation of Kagzi lime fruit is in 3.16 lakh ha. area with the production of 25.71 lakh tons with productivity 8.14 Mt./ha. in India. In Maharashtra state, Kagzi lime area is 53,800 ha. with 2,69,,000 m.t. production. In Akola district the area under Kagzi lime is 2024 ha, production is 12144 million tones and productivity is 60 q/ha. Thus, it was indicated that Kagzi lime is one of the most economically important fruit crop of Vidarbha region next to Mandarin. In Maharashtra, Beed, Parbhani, Osmanabad, Jalna, Aurangabad, Ahmadnagar, Pune, Solapur, Jalgaon, Buldhana & Akola districts are under a lime cultivation.

The area under Kagzi lime cultivation is increasing day by day in Maharashtra State. If the various cultural practices and other scientific techniques of Kagzi lime area followed by the cultivators as a result per hectare yield of Kagzi lime may increased to its maximum level.

The present study has been conducted in Akola, Barshitakli and Murtizapur Panchayat Samities of Akola district . In these Panchayat Samities, Kagzi lime is grown on large scale. This study is essential to know the knowledge, adoption and attitude of Kagzi lime growers about Kagzi lime technologies. This study can also be useful to extension workers for disseminating the information about Kagzi lime technologies released by Dr. PDKV, Akola. This study would be important to know the knowledge, adoption and attitude regarding Kagzi lime technologies released by Dr. PDKV, Akola. This study was helpful to the extension worker to solve the problems regarding Kagzi lime cultivation.

1.3 Objectives of the study

The specific objectives as under

1. To study the profile of Kagzi lime growers.
2. To study the adoption behaviour of Kagzi lime growers about recommended cultivation practices of Kagzi lime.
3. To study the relationship between selected characteristics of the farmers with their adoption behaviour about cultivation practices of Kagzi lime.
4. To study the constraints in adoption of the Kagzi lime cultivation practices.

1.4 Scope of study

Kagzi lime is one of the most important fruit crop in Vidarbha. The production of kagzi lime is medium as compared to other parts of the Maharashtra. The desired target of production can only be achieved when majority of the farmers are motivated to adopt the new agriculture techniques. These new agricultural technologies could be useful for increasing the

production of Kagzi lime per hectare and by helping the farmers in reducing per hectare cultivation cost in order to increase their profit.

The findings of study will be helpful to know the profile of Kagzi lime growers in respect of Kagzi lime. It also helpful to know the knowledge, adoption and attitude of farmers about package of practices of Kagzi lime as mentioned in the Krishi Sanvadini (Dr. PDKV Diary). Efforts will also made to find out the level of knowledge, adoption and attitude of Kagzi lime recommendations released by Dr. PDKV, Akola.The study will be helps in identifying the extent of adoption and their attitude towards Kagzi lime technology. The relational analysis of the characteristics of Kagzi lime growers with knowledge, adoption, attitude and adoption behaviour of Kagzi lime growers about Kagzi lime technologies provide guidelines in manipulating released variables for securing higher adoption.

The result of study will be helpful to policy maker, research scientists and extension workers to formulate the strategy to increase economic condition of Kagzi lime growers. This study reveals present status of knowledge and extent of adoption of improved technology about Kagzi lime by the farmers.

As it is student study; time, money and resources do not permit the researcher to cover the larger area that would be taken for the study. Hence, findings was applicable to this area or at other places where social and agro climatic conditions are similar.

1.4.1 Limitations of the study

The present study is confined to investigate the knowledge, adoption, attitude and constraints faced by Kagzi lime growers regarding their cultivation, in Akola, Barshitakli and Murtizapur Panchayat Samities of Akola district. However, study had the following limitations.

1. This study has been conducted in three Panchayat Samities of Akola district. As it is student's research, time, money and other resources do not permit to cover large area.

2. The findings of this study are based on the opinion expressed by the selected respondents. Therefore its objectivity is limited to the opinion expressed by them.

1.5 Hypothesis

The research hypotheses mentioned below are developed on the basis of findings of previous research study.

The hypothesis are set up and presented in null form (H0) as below.

1) There is no significant relationship between the selected personal, socio-economic and psychological characteristics of the kagzi lime growers and their knowledge about recommended cultivation practices of kagzi lime.

2) There is no significant relationship between the selected personal, socio-economic and psychological characteristics of the kagzi lime growers and their adoption of recommended cultivation practices of kagzi limes.

CHAPTER II

REVIEW OF LITERATURE

A review of literature is one of the important aspects in research process. A comprehensive review of literature is important in successful research work. In any scientific investigation, it is mandatory for research worker to go in depth into the earlier studies conducted, so as to know the methodology adopted in past studies and the consultancy helps the researchers to get acquainted with the subject matter. The finding of the past research studies are reviewed keeping in view, and the objective and variables selected for the present study and presented in following sequence.

2.1 Reviews related to independent variables
2.2 Reviews related to dependent variables
2.3 Review related to constraints
2.4 Conceptual model of research.

2.1 Reviews related to Independent variables

The set of independent variables in the present study included personal, situational, socio-economic, psychological and communication characteristics of the Kagzi lime growers. The reviews of past studies pertaining to these variables have been presented below.

2.1.1 Age

Patil (1990) reported that there was non-significant relationship between age and adoption behaviour of big and small Orange growers.

Nimje *et al.* (1991) found that age of respondents had shown a non-significant association with knowledge of Ber growers about Ber cultivation practices.

Jayale and Nachane (1994) observed that age of Orange growers was negatively and significantly related with adoption of recommended practices of Mango and Citrus crop.

Bhujbal and Kadam (1995) observed that age of Fig growers had non significant association with the adoption of improved package of practices of Fig.

Bhople *et al.* (1996) found that age of Orange growers had negative and significant relationship with information management behaviour.

Chaudhari and Kadam (2000) reported that age of Orange growers had positive and non-significant correlation with the resource management constraints faced by them.

Anonymous (2002) observed that, one third (38.34%) of the respondents were below 35 years in age. It was followed by 33.33% who belongs to the age group of 36 to 50 years.

Missal (2002) in his study entitled 'A study an adoption of Paclobutrazol technology by mango growers in Sindhudurg district revealed that majority (64.00%) of the respondents belonged to the middle age group while remaining respondents were distributed equally in young age (18.00%) and old age (18.00%) categories. The average age of the respondents was 45 years.

Thorat (2003) conducted a study on technological gap and constraints in adoption of recommended cultivation practices of mango growers and witnessed that 71.00 per cent of the respondents were in the middle age group while 16.00 per cent of the respondents were in the 'old' age group and 13.00 per cent of them were in 'young' age group. The average age of the respondents was 46 years.

Moulasab (2004) in his study on knowledge and adoption of improved cultivation practices by mango growers of north Karnataka reported that majority of the respondents (59.17%) were middle aged (30-35 years). The respondents below 30 years of age were 22.50 and 18.33 per cent of the respondents were from old age.

Gotyal (2007) in his study on backward and forward linkages of Grape production in Karnataka observed that 40.50 per cent of the farmers

belonged to old age category followed by middle age (39.00%) and young age (18.50%).

Patil (2008) in his study on constraints analysis of Grape exporting farmers of Maharashtra state he observed that respondents have been spread in all the three age group viz. young age (36.00%), middle age (34.00%) and old age (30.00%), respectively.

Thakare (2008) observed that, maximum number(40.00 %) of grape growers respondents were included in the middle age group of 36 to 50 years.

Kadam *et al.* (2010) observed that, 56.00 per cent of the sugarcane growers were belonging to middle age group (36 to 50 years).

Sorate (2011) observed that, maximum number of grape grower respondents (53.00%) were included in the middle age group of 36 to 50 years.

2.1.2 Education

Kothekar (1987) found that 95% of Orange growers were educated.

Bulkande (1988) found that education of respondents was positive and significant correlation with adoption of recommended Orange technology.

Chikhale *et al.* (1996) concluded that education has positive and significant correlation with the adoption of Orange production technology as recommended.

Kinkhedkar (2001) observed that majority of Orange growers with bearing (47.74%) Orange orchards were educated upto high school to college level.

Thorat (2003) conducted a study on technological gap and constraints in adoption of recommended cultivation practices of mango growers and observed nearly half that maximum number (46.00 %) of the respondents had secondary education, followed by 'graduation' (23.00 %), 'higher secondary' (15.00 %), 'primary' (10.00 %) and pre-primary (6.00 %) education. Only 10.00 per cent of the respondents were illiterate. The average education level of the respondents was 10th standard.

Kharade (2003) observed that one tenth (10.00%) of the Grape growers had primary school education while namely half (50.62%) of the Grape growers had secondary school education. Only, 15.51 per cent of the Grape growers had higher education i.e. above 12th standard and 16.25 per cent Grape growers were graduate while, only 07.62 per cent of them were illiterate.

Shinde (2005) observed that substantial per cent of the pomegranate growers (39.16%) were educated up to primary school, 20.00 per cent of the pomegranate growers were illiterate, 17.50 per cent of the pomegranate growers were educated up to secondary school and 13.34 per cent of the pomegranate growers were educated up to college level whereas, only 10.00 per cent of the pomegranate growers were educated upto high school level.

Ankush and Kolgane (2008) observed that 38.33 per cent of the pomegranate growers were having education up to middle school level followed by high school level (25.00 %), primary school level (20.00 %), illiterate (11.67 %) and college level (5.00 %).

Moulasab (2004) in his study on knowledge and adoption of improved cultivation practices by mango growers of north Karnataka, observed that more than 23.00 per cent of the respondents had education up to primary school, 19.00 per cent of the respondents had studied up to college 9.16 per cent had education up to graduate level, less than one fifth (18.33%) of the respondents were illiterates, while only 4.16 per cent of respondents had post graduate education.

Gotyal (2007) in his study on backward and forward linkages of Grape production in Karnataka reported that 43.50 per cent of the farmers belonged to low educational level followed by higher educational level (35.00%) and medium (21.50%) educational level.

Patil (2008) in his study on constraints analysis of Grape exporting farmers of Maharashtra state observed that 38.00 per cent of respondents had completed pre-university course, follower by graduation (25.00%), High school (21.00%). None of them were illiterates.

Thakare (2008) observed that 28.70 per cent of the grape grower respondents were educated up to higher secondary school education level (8^{th} to 10^{th} standard).

Kadam *et al.* (2010) observed that, the maximum number (35.33%), sugarcane growers, respondents were educated up to higher secondary level (8^{th} to 10^{th} standard).

Sorate (2011) observed that 35.00 per cent of the grape grower respondents were educated up to high school education level (8^{th} to 10^{th} standard).

2.1.3 Land holding

Yawalkar (1988) observed that the land holding was found to be significantly and positively correlated with adoption of plant protection recommended for Orange.

Nimje (1993) found that more than half (54.00%) of the orchardists possessed land holding between 2.01 and 4.00 hectares.

Anonymous (1997) observed that more than half (52.50%) of the majority of land holding between 5 to 25 acres of Kagzi lime orchards.

Gomase (1997) revealed that the majority of Orange growers with pre bearing and bearing (40.00 % and 37.50%) Kagzi lime orchards possessed land holding between 5 to 10 acres.

Kinkhedkar (2001) found that majority of Orange growers with bearing (50.32%) had large (above 10.00 ha.) followed by medium land holding (4.01 to 10 ha).

Deshpande and Deshpande (2002) observed that 55.00 per cent of the pomegranate growers were from semi-medium land holding followed by 31.66 per cent from small, 8.34 per cent from medium and 5.00 per cent from marginal land holding, respectively.

Kharade (2003) observed that 73.75 per cent of Grape growers had size of land holding up to 2.00 ha. while, 19.37 per cent of them had size of

land holding between 2.01 to 4.00 ha., followed by 6.88 per cent of Grape growers had size of land holding between 4.01 to 10.00 ha.

Gangurde (2003) revealed that majority of banana growers (57.30%) possessed medium land holding (2.01 to 10 ha). There is significant correlation between land holding and adoption of improved practices of banana cultivation.

Shashidhara (2003) in his study on socio-economic profile of drip irrigation farmers in Shimoga and Davanagere district of Karnataka state revealed that, comparatively more number of farmers (46.67%) belonged to semi medium category followed by medium (32.22%) and small land holding categories (18.89%).

Ankush and Kolgane (2008) observed that maximum number of the pomegranate growers (41.67%) were small farmers followed by the medium (20.00 %) and semi medium farmers (3.33 %).

Kadam *et al.* (2010) observed that, the higher proportion (42.67%)of the respondent sugarcane grower's possessed medium land holding of sugarcane i.e. up to 6 ha.

Sorate (2011) observed that, relatively higher proportion of the respondent grape growers (31.00%) belonged to category of medium land holding ranging from 4.01 to 10.00 ha.

2.1.4 Annual income

Yawalkar (1988) found a significant association between annual income and management of plant protection resources for Orange cultivation.

Jayale and nachane (1994) also clearly indicated that annual income found to be positively and significantly correlated with the adoption of recommended practices of citrus crop.

Dahake (1996) found that more than two third (69.00 %) of the Orange growers had their annual income Rs. 1,00,000.

Vijayakumar (1997) reported that, about half of the growers (51.00%) belonged to medium income category followed by low (47.00%) and high income category (2.00%).

Chandran (1997) conducted a study on Tapioca growers of Eranakulam district in Kerala and found that, 33.33 per cent of the respondents belonged to low income category, while 40.00 and 26.67 per cent were under medium and high income category.

Ahire *et al.* (1999) observed that annual income of respondents had positively and significantly related to the quantum of knowledge of Grape technology.

Patil *et al.* (1999) found that annual income of Kagzi lime growers had significant and positive correlation with the knowledge about Kagzi lime production technology.

Kinkhedkar (2001) found that majority of Orange growers with bearing (39.55 %) were economically sound with annual income Rs. 3,00,001 to 6,00,000.

Babanna (2001) in his study on Arecanut growers of Shimoga district in Karnataka revealed that 61.60 per cent of the respondents belonged to medium income category while 23.40 and 15.00 per cent were under low and high income category.

Kharade (2003) observed that 28.13 per cent of the Grape growers had annual income between Rs. 1,00,000 to 2,00,000/- while one fourth (25.00 per cent) and one fifth (20.00 per cent) of them had annual income between Rs. 2,00,001 to 4,00,000/- and Rs. 50,001 to 1,00,000/-, respectively. About 18.75 per cent of Grape growers had annual income of Rs. 4,00,000/- and above, only 8.12 per cent of them had annual income up to Rs. 50,000/-.

Ankush and Kolgane (2008) observed that maximum pomegranate growers (46.66 per cent) were having their annual income from Rs.1,00,000/- to 2,00,000/- followed by up to Rs. 1,00,000/- (35.00 per cent), Rs. 2,00,001/-

to 3,00,000/- (16.67 per cent) and Rs. 4,00,001/- to 5,00,000/- (1.67 per cent), respectively.

Thakare (2008) observed that, from the distribution of the respondents according to annual income it may be noted that majority of the respondents (54.70 %) had annual income between Rs. 5, 00,001 to 10, 00,000 of grape growers.

Kadam *et al.* (2010) observed that, the majority (79.34%)of the respondents were in medium income group (Rs. 56.651 to Rs. 1, 49,883) of sugarcane cultivators.

Sorate (2011) observed that, large majority of the grape growers (89.00 %) were having annual income up to Rs.845666.

2.1.5 Area under Kagzi lime cultivation

Kadam (1999) revealed that half of farmers (50.66%) had medium size of orchard. He further found that there was no significant association between the area of orchard and resource management.

Yawalkar (1988) revealed that near about half of the respondents (47.62 %) had Orange orchard under 2.1 to 5 acres.

Nimje (1993) found that size of orchard had significant correlation with adoption of resources required for Orange cultivation.

Dahake (1996) found that half of (51.00 %) the respondents possessed 251 to 500 Orange plants.

Anonymous (1997) observed that more than half of (55.84 %) the respondent had 101 to 300 plants in their Orange orchards.

Anonymous (2002) that higher percentage of Orange growers (40 %) had an orchard of more than 500 trees. It was followed by 35.00 per cent respondents having orchard of 251 to 500 trees.

2.1.6 Experience in Kagzi lime cultivation

Bansod (1993) observed that more than half (54.67 %) of the majority of Orange growers had 11 to 20 years of experience in Orange cultivation.

Chikhale *et al.* (1996) found that experience in Orange cultivation had negative and significant correlation with adoption of Orange production technology. He further found that most of Orange growers having medium level of experience in Orange cultivation (82.00 %).

Kumbhare (1996) concluded that 72.00 per cent participants of KVK training programme were found in the medium category of farming experience.

Gomase (1997) observed that more than three fourth majority (73.75%) of the growers with pre-bearing orchards had farming experience of 2 to 6 years. While great majority of bearing lime orchard (76.25%) were experienced in Kagzi lime cultivation from 6 to 18 years.

Mahajan (2000) found that majority of the banana growers (60.00 %) were having 11 to 20 years of experience in banana cultivation, followed by 25.30 per cent having experience upto 10 years in banana cultivation.

Rameshetwad (2001) reported that, majority of the banana growers (39.16 %) had experience of 6-10 years.

Gangurde (2003) found that, majority of the farmers (41-56 %) growing banana had experience of 5 to 8 years in banana cultivation.

Bhosale (2003) revealed that, 58.13 per cent of the pomegranate growers had experience of 7 to 11 years while 21.25 per cent of them had experience below 6 years. The 20.62 per cent of the pomegranate growers had experience of over more than 12 years

Ghodeswar (2006) noticed that more than half (55.00 per cent) of the pomegranate growers had farm experience of 4 to 6 years and 23.34 per cent of pomegranate growers had farm experience of 7 years and above

while, 21.66 per cent of them had farm experience up to 4 years in pomegranate cultivation.

Karale (2006) observed that maximum percentage of the Grape growers (80.33 %) were having 3.01 to 10.00 years of experience in Grape cultivation. As much as 5.84 per cent of Grape growers were found to be engaged in Grape cultivation from 3.00 years. About one fifth (13.33%) of Grape growers were experienced in Grape cultivation for more than 10.00 years.

Thakare (2008) found that, most of the respondents (44.60%) had experience of 3 to 6 years in Grape cultivation. It was fallowed by (28.07%) respondents who had experience above 6 years and (27.33%) of the respondents had experience up to 3 years in Grape cultivation.

Sorate (2011) found that, majority of the respondents (79.00%) had experience of 4 to 8 years in grape cultivation. It was followed by (12.00%) respondents who had experience up to 4 years and (09.00%) of the respondents had experience above 8 years in grape cultivation.

2.1.7 Innovativeness

Ananda (1992) conducted a study on drip irrigation efficiency among Grape growers of Bangalore district in Karnataka and focused that 40.00 per cent of the drip irrigation adopters had medium innovative proneness, whereas 30.00 per cent each were grouped under low and high innovative proneness categories.

Kumar (1998) conducted a study on banana growers in Bangalore district of Karnataka state and pointed out that, 40.00 per cent of the banana growers had less innovativeness followed by 37.00 per cent of them had medium and 23.00 per cent of them had high innovativeness.

Babanna (2001) conducted a study on arecanut growers in Shimoga district in Karnataka and focused that 34.10 per cent farmers were of medium innovative proneness category followed by 33.33 per cent of them having high and 32.66 per cent of them possessed low innovative proneness.

Natikar (2001) conducted a study on attitude and use of farm journal by the subscriber farmers and their profile in North Karnataka and revealed that, 73.75 per cent of the subscriber farmers belonged to medium innovativeness category followed by low (15.63%) and high (10.62%) innovativeness categories.

Shashidhara (2004) reported that higher percentage (47.50%) of the respondents were in medium innovativeness category followed by low (31.66%) and high (20.83%) innovativeness category.

Patil (2007) inferred that majority of the respondents were found in medium level of innovativeness.

2.1.8 Risk preference

Geete (1999) while studying the risk preference observed that a large number of respondents (i.e. 59.33 %) belonged to medium risk preference category level and only 15.33 per cent were having high risk preference level.

Salame (2000) noted that, majority of the respondents (65.33 %) preferred to take moderate risk involved in chilli cultivation and it was found positively and significantly correlated with knowledge about chilli cultivation.

Kausadikar *et al.* (2002) reported that risk preference had positive and significant relationship with attitude of farmers towards horticultural development programme.

Bhosale (2003) found that more than half (53.33%) of the farmers had possessed medium risk preference level whereas 29.37 per cent of respondents Orange growers had high risk preference group while only 17.33 per cent of respondents farmers had possessed low risk performance.

Thakare (2008) found that maximum percent of the respondents (62.67%) was observed under high risk preference category. Thus was followed by (36.67%) of them who were under medium risk preference category. Only one respondent (0.66%) appeared in low risk preference category.

Kadam *et al.* (2010) observed that, the majority (73.33%),of the respondents had medium risk preference ability of sugarcane growers.

Sorate (2011) found that majority of the grape grower respondents (62.00%) were observed under medium risk preference category. This was followed by (26.00%) of them who were under high risk preference category and only12.00 per cent of them appeared in low risk preference category.

2.1.9 Extension contact

Patil and Waghdhare (1989) observed that extension contact had significant correlation with adoption of banana cultivation technology.

Nimje *et al.* (1991) found that extension contact had non significant correlation with knowledge about Ber cultivation practices among farmers.

Patil *et al.* (1999) concluded that majority of respondents had positive and significant correlation with the knowledge about Kagzi lime.

Dhamodaran and Vasanthakumar (2001) in their study on adoption of improved sugarcane cultivation practices revealed that, majority of the respondents (52.50 per cent) had low level of extension agency contact, followed by 47.50 per cent of the respondents had medium level of extension agency contact.

Palaniswamy and Sriram (2001) in their study found that majority of the respondents (84.35 per cent) had medium level of extension agency contact, followed by 5.45 per cent and 10.20 per cent of the respondents had low and high level of extension agency contact.

Bhosale (2003) found that the significant relationship between farmers extension contact and their knowledge and adoption of drip irrigation system.

Sunilkumar (2004) conducted a study on tomato growers had revealed that, 40.83 per cent of the respondents belonged to medium extension contact category followed by 30.00 per cent and 29.16 per cent

belonging to high and low categories of extension contact, in Belgaum district of Karnataka state, respectively.

2.1.10 Sources of information

Pande and Narayanmurty (1991) reported that farmers used more localite source of information than others for getting Agricultural innovation information.

Raghavendra (1997) in a study on knowledge and adoption behaviour of Arecanut farmers of South Canara district, Karnataka state, revealed that 50.00 per cent of the Arecanut growers consulted progressive farmers for cultivation practices of Arecanut followed by mass media sources 25.00 per cent and institutional sources 20.00 per cent.

Bhople *et al.* (1997) reported that 98.33 per cent and 95.83 per cent of the Orange growers consulted friends, neighbors and progressive Orange growers of Maharashtra respectively. This was followed by listening the radio broadcast, visit to the officer of the village extension workers, contact with agro services centers and personal contact with Agricultural Extension Officer, university scientists and participation on field days were the least consulted sources/ channels.

Wagdhare *et al.* (1998) reported that village extension workers of training and visit systems were the top most credible source and information as perceived by the small farmers of the Maharashtra, followed by neighbours /friends, progressive farmers and TV.

Kumar (1998) in his study on knowledge, adoption and economic performances of banana growers, reveal that a major proportion 50.00 per cent of the banana growers had consulted neighbours and friends to get information regarding banana cultivation.

Jyothi (2000) reported that input dealers were the most frequently consulted information sources followed by progressive farmer, TV, Extension personnel of private organization, friends, radio and Assistant Agriculture Officers.

Kumbhar (2003) showed that 45.00 per cent the pomegranate growers had used medium sources of information while 34.17 per cent and 20.83 per cent of the pomegranate growers had low and high sources of information.

Thakare *et al.* (2004) concluded that younger farmers utilize sources namely friends, neighbors, village level workers and progressive farmers more frequently.

Shinde (2006) found that majority (65.63 per cent) of pomegranate growers were in the medium category of use of sources of information while, 18.12 per cent and 16.25 per cent in low and high categories of sources of information, respectively.

Karale (2006) observed that majority of the respondents (61.67 %) were having medium level of exposure to different sources of information about Grape cultivation. About one fourth (28.33 %) of the respondents were having lower exposure to different sources of information. Only (10.00 %) of the respondents had high exposure to various sources of information for seeking information about Grape cultivation. Thus, it could be inferred that majority of the Grape growers utilized various sources information to a medium level for getting information and guidelines about Grape cultivation.

Thakare (2008) observed that majority of the respondents (75.34%) were having high sources of information. While (23.33%) of the respondents were having medium sources of information. Only (1.33%) of the respondents were having low sources of information about Grape cultivation.

2.2 Reviews related to Dependent variables

2.2.1 Knowledge

Patil (1990) indication that among small and big Orange growers, the low level of knowledge was associated with low level of adoption behaviour towards improved cultivation practices of Orange.

Singh *et al.* (1991) found that as high as 63.16 per cent of citrus growers had poor knowledge about the improved production technology of

citrus crops. On the other hand only 8.24 per cent of the citrus growers had low level of knowledge gap. It indicated that they were exposed to the improved technology of citrus cultivation.

Nimje (1993) observed that higher proportion (59.33%) of the orchardists possessed medium level of knowledge, 27.33 per cent orchardists belonged to high category of knowledge and 13.14 per cent i.e. very few respondents were in the low category of knowledge regarding recommended cultivation practices of Orange.

Jayale and Nachane (1994) observed that 79.00 per cent of the farmers possessed to high knowledge about citrus and mango cultivation.

Patil (1999) found that more than half of the Kagzi lime growers had moderate knowledge about Kagzi lime production technology.

Chaudhari and Kadam (2000) found that knowledge about orchard management practices had positive and significant correlation with resource constraints found by farmers. They further found that higher knowledge found to face more resource management constraints.

Waman and Patil (2000) noticed that farmers were lacking in the knowledge about improved structure (41.32 per cent), grading, handling care during storage period and also lack of knowledge about curing and drying of onion (58.68 per cent).

Mahajan (2000) reported that, majority of the banana growers (64.00%) found to have adopted recommended practices of banana upto medium extent.

Pawar (2001) reported that, majority of farmers had complete level of knowledge about tissue culture technique of banana.

More (2002) found that majority of banana growers were aware about the recommended varieties (cent per cent), types of soil (95.83 %) required for banana cultivation, seed rate per hectare (94.16 %) comparatively less no. of banana growers were knowing about the occurrence of insect pest

(56.66 %), occurrence of diseases (54.16 %), occurrence of weeds (41.60 %), practice of earthing up (40.00 %) and sunscroching (36.66 %).

Deshpande and Deshpande (2002) revealed that 52.50 per cent pomegranate growers were from medium knowledge level followed by 40.00 and 7.50 per cent from high and low knowledge level category, respectively.

Kharade (2003) observed that 49.37 per cent of the Grape growers had medium level of knowledge while, nearly equal Grape growers i.e. 25.63 and 25.00 per cent of them had high and low level of knowledge, respectively.

Bagle (2003) observed that most of the respondents had low level of knowledge for cultivation of Ber.

Bhosale (2003) noticed that near about one third (71.25 per cent) of pomegranate growers were having medium level of knowledge while 17.25 per cent and 11.50 per cent of pomegranate growers were having low and high level of knowledge of post harvest technology in pomegranate.

Meti (2005) found that majority of the farmers had medium level of knowledge about nutrient management, plant protection and FYM application practices in Papaya cultivation.

Chavan (2005) observed that 57.34 per cent grape growers had complete knowledge, while 37.33 per cent and 5.33 per cent of them had partial and no knowledge about grape cultivation respectively.

Dhakane (2005) observed that majority(71.33%) of grape growers had medium level of knowledge, while 15.34 per cent and 13.33 per cent of respondents had low and high level of knowledge respectively.

Hinge (2009) revealed that 45.00 per cent of the wine grape growers belonged to medium level of knowledge about recommended practices of grape cultivation with a mean score of 24.47. Whereas, 40.62 and 14.37 per cent of the grape growers belonged to high and low knowledge level with mean knowledge scores of 27.7 and 23.91, respectively.

Tavethiya *et al.* (2009) observed that 60.00 per cent of the cumin growers were medium level of knowledge where as equal number of cumin

growers i.e. 20.00 per cent had high and low levels of knowledge about recommended cumin production technology. However, on an average the knowledge of recommended cumin production technology was 24.36%.

Kadam *et al.* (2010) observed that, the majority (61.33%), of the respondents had medium level of knowledge of sugarcane cultivators.

Sorate (2011) observed that, large majority of the grape growers (96.00%) found to have higher knowledge about cultivation practices of grape.

2.2.2 Attitude

Tripathi (1977) reported that the attitude towards farming formed an important factor in agricultural development.

Baldeosingh (1980) revealed that small farmers had strongly favorable attitude towards the large adoption of chemical fertilizers to achieve better yield and income.

Kapgate (1987) found that the decreased in attitude level of the adoption level also decreased.

Kulkarni (1991) found a positive relationship between attitude and knowledge of farmers towards dry land Horticulture.

Sadamate *et al.* (1991) observed that main expectation of visiting farmers were to learn about the latest technological advances in agriculture 44.6 per cent and improved high yielding varieties 31.1 per cent.

Patil (2001) observed that the favorable attitude of Banana growers towards tissue culture cultivation of Banana.

More (2002) observed that the attitude towards cultivation of tissue culture banana growers (72.00%) and conventionally cultivated banana growers (74.00%) were found moderately favorable attitude followed by 8.00 per cent tissue culture banana growers and 18 per cent conventionally cultivated banana growers had less favorable attitude towards cultivation of banana.

Kausadikar *et al* (2002) observed that, majority (60.00%) of the respondent had less favorable attitude toward horticultural development programme while remaining (40.00%) of the respondent had more favorable attitude toward horticultural development programme.

Sharanagat (2008) observed that majority of respondent (56.67%) had moderately favorable attitude towards National Horticultural Mission, followed by 24 per cent had less favorable and 19.33 per cent of the respondents were having more favorable attitude towards National Horticultural Mission

Bite (2009) observed that majority (85.00%) of respondents were having favorable and highly favorable attitude towards farm mechanization.

2.2.3 Adoption

Yawalkar *et al.* (1991) revealed that 50.00 per cent of the respondents partially adopted the recommended plant protection measures in cultivation of Orange.

Srinivas Reddy (1995) conducted a study in Kolar district of Karnataka state and reported that 37.00 per cent of mango growers had medium level of adoption while, 33.00 per cent and 30.00 per cent belonged to high and low adoption categories.

Chikhale *et al.* (1996) conducted a study in Amaravati district of Maharashtra state and reported that, majority (60.50 %) of the Orange growers had medium level of adoption of recommended cultivation practices followed by low level of adoption (22.50 %) and high level of adoption (14.00 %).

Gomase (1997) found that more than three fifth (63.75%) and 72.50 per cent of growers with pre bearing and bearing Kagzi lime orchards respectively adopted recommended practices of the moderate extent. However more or less equal i.e. 23.75 per cent, 12.50 per cent of growers with the bearing and bearing Kagzi lime orchards adopted practices at low level and more than one tenth i.e. 12.15 per cent and 15.00 per cent of

growers with pre bearing and bearing Kagzi lime orchards respectively adopted Kagzi lime technology to the higher extent.

Chikhale *et al.* (1998) in his study on adoption of improved practices by Orange growers reported that, the practices which were adopted by the respondents in majority were: Application of fertilizer (80%), providing support to the fruit bearing trees (80%) and harvesting of fruit as recommended (85%). However majority of the respondents did not adopt the improved cultivation practices such as method of irrigation (80%), plant protection measures (80%), training and pruning (82%), bahar treatment (90%), measures against fruit drop (92.50%) and treatment against decaying of fruit (87.50%).

Gomase *et al.* (1998) in his study on factors influencing adoption of Kagzi lime production technology observed in respect of spacing (85%) number of plants in one hectare (833.25%), digging of pits (81.25%), proper time of planting (63.75%), proper height of plant while planting (61.25%), FYM application (57.50%), filling of pits (55%) and dose of fertilizer (55%) in bearing orchards, whereas selection of suitable soil (62.50%), time of fertilizer application (57.50%) were the practices partially adopted by more than half of the respondents.

Waman and Patil (1998) conducted a study in Nasik district of Maharashtra and revealed that 39.33 per cent of onion growers could identify the pest and disease and only 32.00 per cent of onion growers adopted control measures for these pest and diseases of onion during storage period.

Mahajan (2000) found that 64.00 per cent of banana growers adopted recommended practices of banana up to medium extent.

Patil (2000) revealed that majority of the banana growers had a moderate adoption of tissue culture practices of banana cultivation.

Pawar (2001) reported that most of the banana growers founds to have adopted the recommended practices of tissue culture banana.

Mane (2001) stated that most (70.67 %) of pomegranate growers had medium level of adoption followed by 18.00 per cent of pomegranate growers had low level of adoption and 11.33 per cent of pomegranate growers had high level of adoption.

Govinda Gowda (2002) in his study on Grape reported that majority of the farmers adopted the nursery management practices, correct time and method of pruning, integrated nutrient management, pest and disease management, quality improvement practices, while in nursery nutrient application and pest and disease management adopted partially and majority of Thompson seedless growers had gone for raisin preparation by chemical dipping.

Bagle *et al.* (2003) was found that majority of respondents were in category of low to medium level of adoption.

Moulasab (2004) conducted a study in North Karnataka and reported that, majority of the mango growers (68.33 %) were found to be medium adopters followed by low (19.00 %) and high (12.67 %) adopters.

Chavan (2005) observed that, 65.34 per cent of grape growers had medium level of adoption of recommended practices of grape cultivation, while 19.33 per cent and 15.33 per cent of them had high and low adoption regarding recommended practices of grape cultivation.

Dhakane (2005) observed that majority (69.33%) of the grape growers had medium level of adoption of recommended grape production technology, while 14.00 percent and 16.67 per cent of them had low and high adoption level, respectively.

Hinge (2009) revealed that maximum number of the (39.37%) grape growers belonged to medium adoption category with mean adoption score of 36.48 followed by 31.25 and 29.37 per cent of them in high and low adoption categories with mean adoption scores of 39.00 and 34.03, respectively

2.3 Reviews related to constraints

Gomase (1997) expressed that the shortage of irrigation water, irregular power supply, non availability of labour, ignorance about soil testing, lack of knowledge about application of Bordeaux paste, pest and its control measures.

Anilkumar and Arora (1999) in their study on post-harvest management of vegetables in Uttar Pradesh hills found that non availability of cold storage, highly perishable nature of the vegetables, low market demand at the time of storage, and hence non-profitability of vegetable storage as the major problems perceived by farmers resorting to vegetable storage.

Vasudev and Chowdary (1999) identified problems of production and marketing of tomato in three regions of Andhra Pradesh. Major ones were lack of grading facilities, absence of market information, spoilage and malpractices. They concluded that providing these facilities can improve the marketing efficiency and would help the farmers in realizing better prices.

Achuta and Radhakrishnamurthy (2000) conducted a study on Betelvine growers of Puttur district of Andhra Pradesh and noticed the problems like high incidence of pests and diseases (100%) and non-availability of plant protection chemicals in time (58.33%).

Ravi Shankar and Katteppa (2000) conducted a study on potato growers in Chikmagalore district of Karnataka state. They reported that 94.16 per cent respondents lacked technical guidance. More pests, more diseases, high cost of fertilizers, high cost of plant protection chemicals and non-availability of fertilizers in time, were the other problems faced by 90.00, 83.33, 85.00, 81.00 and 68.33 per cent of the respondents, respectively.

Waman and Patil (2000) conducted a study on onion growers in Nasik district of Maharashtra and revealed that difficulty in identifying pests and diseases (54.66%) and non curable nature of onion diseases even with pesticides (42.00%) were the major problems.

Ajotikar *et al.* (2001) found that 10.83 per cent of Kagzi lime growers faced constraints regarding non-availability of good quality seedlings and 17.50 per cent of Kagzi lime growers faced constraints regarding the seedling prize of Kagzi lime.

Pandey (2001) suggested strategy for increasing onion productivity and minimizing post-harvest losses in onion in Andhra Pradesh. The need to increase production by increasing productivity as also increasing availability of onions for meeting domestic and export requirement exists. For this, he recommended that seed producing agencies and state department of Horticulture should make sure that sufficient quantity of quality seeds of improved varieties are produced every year and made available to farmers at an affordable price to enable them to use the same for increasing productivity. Extension education of farmers with available new pre and post-harvest technologies should be continued or taken up regularly.

Sunil Kumar (2004) in his study on tomato growers in Belgaum district of Karnataka reported that majority (75.83%) of the farmers faced the problem of lack of technical knowledge and guidance about improved cultivation practices as well as post-harvest technology. Whereas, 65.00 per cent of the respondents faced the problem of high fluctuation in market price. Other problems like high transportation cost (62.53%), labour shortage and high wages (55.83%) and lack of irrigation facilities and power shortage (46.66%) were also noticed.

Thiranjana Gowda (2005) reported that 90 per cent of the respondents faced the problem of price fluctuation followed by problem of pest and diseases (65.00%). In a study conducted by Nagesha (2005) majority of the respondents (100%) faced problem of high incidence of pests and diseases followed by other problems such as high cost for fertilizers, chemicals and insecticides, high wages of labour, non-availability of skilled labour and lack of transportation and storage facilities were faced by 87.5, 80.8 and 61.6 per cent of respondents, respectively.

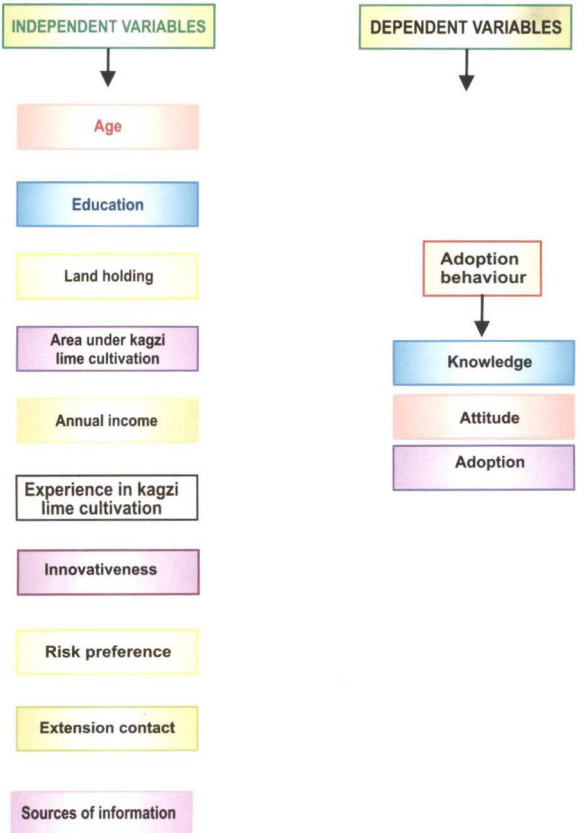

Fig. 1 Paradigm showing the relationship between independent and dependent variables

CHAPTER III

METHODOLOGY

In order to have the research on sound footing, the researcher has to take support of various methods, techniques and tools. He has to accurately define and measure the concepts. For this, the researcher needs to know the procedure so that he can go through it and put forth the efforts in that direction. In view of this, this chapter deals with the research methods, procedures techniques used in the present investigation, which has been discussed with relevant details under the following caption.

3.1 Locale of the study

3.2 Research design

3.3 Sample and sampling procedure

3.4 Development of data collection instrument

3.5 Collection of data

3.6 Study variables and their measurement

3.7 Operationalization, scoring and categorization of variables

3.8 Tabulation and analysis of data

3.1 Locale of the study

The present study was conducted in Akola, Murtizapur and Barshitakali Panchayat Samities of Akola district in Vidarbha region of Maharashtra state being more concentration of Kagzi lime cultivation in this district (2024 ha). There are two sub-divisions in Akola district, viz, Akola and Akot. The Akot Sub-division constitutes four talukas with an area of 122.80 ha. under Kagzi lime cultivation. The farmers from these talukas are cultivating Kagzi lime since long years having rich knowledge about cultivation technologies of Kagzi lime. The area under Akola sub-division is increasing recently. Therefore, the Akola sub-division having talukas namely Akola, Barshitakli and Murtizapur was selected for the study.

Total area of Akola district is 5,431 km^2 (2,097m^2). The total population of Akola district is 18, 18,617 out of which 38.49 per cent is urban population and remaining 61.51 per cent is rural population.

The climate of Akola district is tropical. The major source of irrigation is well water. The soil of this district is varies from medium to heavy black cotton type. The ranges from 700 mm. and maximum temperature ranges between 41°c to 48° c.

3.2 Research design

The aim of the study was to ascertain the level of knowledge, attitude, adoption and adoption bahaviour of Kagzi lime cultivation practices by the farmers hence the exploratory design of research was used for the present study.

3.3 Sample and sampling Procedure

The sampling plan adopted for this research study has been delineated in the succeeding paragraphs.

3.3.1 Selection of Panchayat Samities

The selection of three Panchayat Samities was made purposively on the basis of increasing area under Kagzi lime cultivation in Akola district. In Akola district, Akola, Barshitakli and Murtizapur Panchayat Samities having high area under Kagzi lime cultivation, which is comparatively higher as compared to other Panchayat Samities. Hence, Akola, Barshitakli and Murtizapur Panchayat Samities were selected for the study.

3.3.2 Selection of villages

For the purpose of study before selection of villages, the list of villages where in Kagzi lime is grown on larger area was prepared by consulting Taluka Agiculture Officer working at taluka level in State Agriculture Department. Gramsevak and Talathi of respective villages in Akola, Barshitakli and Murtizapur Panchayat Samities were having larger area under

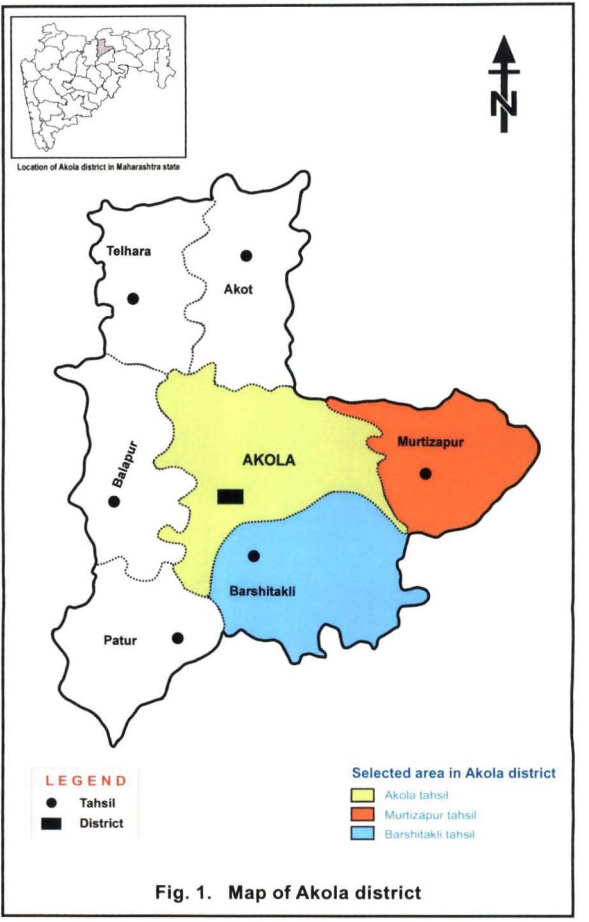

Fig. 1. Map of Akola district

questions in accordance with study objectives. The schedule was divided into two parts. The first part of schedule included the questions related to personal, socio-economic, psychological and communication characteristics of the farmers and the second part of schedule included the questions regarding knowledge, attitude, adoption and constraints of the farmers. For some variables, the teacher made scales were used whereas for some other variables, close / open end questions were included in the interview schedule. This schedule was initially developed in English and then translated into local language Marathi.

3.4.1 Pre-testing of interview schedule

The interview schedule so prepared was pre-tested for its accuracy, simplicity and practicability. The pre-testing of interview schedule is necessary on the part of researcher in order to know mistakes, ambiguities, shortfalls and achieving of clarity, reliability and validity. The pre-testing of interview schedule was done on ten farmers of Chikhalgaon, Chandur and Kapshi in Akola Panchayat Samiti who were not included in the sample. The data collected from such non sample farmers was thoroughly studied to detect the unfamiliar words, vagueness and complexity of questions included in the schedule. Considering the experience of pre-testing the necessary changes were made in interview schedule. The interview schedule was then finalized and required number of copies were got prepared for data collection.

3.5 Collection of data

The data were collected by face to face contact method by contacting the farmers by using interview schedule. The farmers were contacted at their home as per their convenience for easy and quick approach to farmers, the help of Sarpanch, Gramsevak was taken. Before actually procuring the information, farmers were introduced with the objectives of present study. The data were collected from 120 respondents during the period from 10th March to 20th April, 2013.

Kagzi lime cultivation. Four villages from each Panchayat Samiti were selected purposively.

3.3.3 Selection of respondents:

List of Kagzi lime growers with 4-5 years old orchards was obtained from District Superintendent Agriculture Office (DSAO) and Taluka Agriculture Office (TAO) under study. Ten respondents from each village were selected randomly. Thus, total 120 respondents was constitute a sample for the present study. The village wise list of Kagzi lime growers cultivating conventional Kagzi lime since 5 to 9 years was prepared by the help of Gramsevak and Talathi.

Table1: Village wise respondents selected for the study.

Sr. No.	Villages	No. of respondents
A	**Akola Panchayat Samiti**	
1	Borgaon Manju	10
2	Washimba	10
3	Sindakhed Moreshwar	10
4	Chikhalgaon	10
B	**Barshitakli Panchayat Samiti**	
1	Barshitakli	10
2	Nimbi	10
3	Rajanda	10
4	Mahagaon	10
C	**Murtizapur Panchayat Samiti**	
1	Mana	10
2	Hirpur	10
3	Hatgaon	10
4	Kharbadi	10
Total		**120**

3.4 Development of Data Collection Instrument

In order to seek the information regarding adoption behaviour of farmers about Kagzi lime cultivation, development of an interview schedule was an important aspect. The interview schedule was designed with relevant

3.5 Variables and their measurements

The variables selected for the study and the procedure adopted for their measurement are explained in Table 2 for the measurement of variables standardized scales were used wherever available and where they were not available schedule were developed.

Table 2 : Study Variables and their Empirical Measurements

Sr. No.	Variables	Empirical Measurements
I.	**Independent variables**	
A.	**Personal and Socio-economic characteristics**	
1.	Age	Chronological age of the farmers in years at the time of Interview.
2.	Education	Numerical score of one was assigned for each year of Schooling.
3.	Land holding	Number of hectares of land possessed by an individual respondent.
4.	Area under Kagzi lime cultivation	Actual area in hectare under Kagzi lime cultivation.
5.	Annual income	Annual income in rupees from all sources in a year.
6.	Experience in Kagzi lime cultivation	It refers to total number of years of experience in Kagzi lime cultivation considered as his experience.
B.	**Psychological characteristics**	
7.	Innovativeness	It was measured with the help of scale developed by Singh(1972).
8.	Risk preference	It was measured with the help of scale developed by Supe (1969).
C.	**Communication characteristics**	
9.	Extension contact	It was measured in terms number of contacts by the respondent with extension workers and its frequency i.e. always,

		sometimes and never by assigning the score 2, 1 and 0 respectively.
10.	Sources of information	It was measured in terms of number of contacts and its frequency i.e. always, sometimes and never by assigning the score 2, 1 and 0 respectively.
II.	**Dependent variables**	
11.	Knowledge	The body of awareness and information possessed by an individual Kagzi lime grower about Kagzi lime technologies. It was measured with the help of teacher made knowledge test.
12.	Attitude	Attitude statement was framed and the respondents was obtained on 3 points continuum ie. Agree, undecided and disagree of 3, 2 and 1 respectively for positive statement and reverse scoring was followed for negative statement included in the attitude test. It was measured with the help of teacher made attitude test.
13.	Adoption	It is the degree of actual use of Kagzi lime technologies by Kagzi lime growers. It was measured with the help of teacher made adoption test.
14	Adoption Behaviour	The Adoption Behaviour was conceptualized as sum total of Knowledge, attitude and adoption of Kagzi lime cultivation practices.

3.6 Operationalization and categorization of variables

The operational definitions, procedures adopted for scoring and categorization of both independent and dependent variables are explained in the subsection.

3.6.1 Independent variables

Based on review of literature and opinion of the experts in the field of extension education the independent variables age, education, land holding, annual income, area under Kagzi lime crop, experience in cultivation Kagzi lime crop, extension contact, source of information, innovativeness, risk preference, knowledge, attitude and adoption were selected and operationlized as bellow.

3.6.1.1 Age

Age is operationally defined as the chronological age of a selected individual respondent in completed years. The respondents were classified in the following three categories.

Sr. No.	Category	Age (Years)
1.	Young	Up to 35
2.	Middle	36 to 50
3.	Old	Above 50 years.

3.6.1.2 Education

Education is taken as number of standards in formal school passed by an individual respondents. Each standards passed was given one score and following categories were made was followed.

Sr. No.	Category	Standard
1.	Illiterate	Having no formal education
2.	Primary school	1^{st} to 4^{th} std.
3.	Middle school	5^{th} to 7^{th} std.
4.	High school	8^{th} to 10^{th} std.
5.	Junior college	11^{th} to 12^{th} std.
6.	College	Above 12^{th} std.

3.6.1.3 Land holding

It refers to the total land in hectares possessed by an individual respondents for cultivation. The number of hectares of land possess was considered as individual respondent and categorized into following categories (as per Government of Maharashtra.)

Sr. No.	Category	Land holding(ha.)
1.	Marginal	Up to 1.00ha
2.	Small	1.01 to 2.00ha
3.	Semi medium	2.01 to 4.00ha
4.	Medium	4.01 to 10.00ha
5.	Large	Above 10.00ha.

3.6.1.4 Area under Kagzi lime cultivation

It is operationally defined as the actual area of land put by an individual farmer under Kagzi lime cultivation and categorization was done on the basis of minimum and maximum score obtained.

Sr. No.	Category	Area under Kagzi lime(ha)
1	Low	Up to 1.5
2	Medium	1.6 to 2.9
3	High	3.0 and above

3.6.1.5 Annual income

It refers to the gross income of all the family members of the Kagzi lime growers from all sources in rupees per annum. The respondents were categorized on the basis of equal interval method.

Sr. No.	Annual income (Rs.)
1	Up to 2,00,000
2	2,00,001 to 4,00,000
3	Above 4,00,001

3.6.1.6 Experience in Kagzi lime cultivation

It operationally defined as the experience of the growers in terms of years of working in Kagzi lime cultivation. On the basis of mean and standard deviation, the respondents were categorized into three groups viz. Low, medium and high.

Sr. No	Experience	Score
1	Low	Up to 6
2	Medium	7 to 9
3	High	Above 9

3.6.1.7 Innovativeness

It is defined as the degree to which an individual Kagzi lime growers relatively earlier in adopting technologies of Kagzi lime cultivation than others in the community.

The scale developed by Singh (1972) was used to measure innovativeness. There were six statements in scale, out of which statement Nos. 1, 4 and 5 were positive and remaining i. e. 2, 3 and 6 were negative. The responses were collected on three point continuum viz. agree, undecided and disagree. The positive statements were assigned the score of 3, 2 and 1

for responses category namely agree, undecided and disagree, respectively. Reverse scoring was done for negative statements. On the basis of mean and standard deviation, the respondents were categorized into three groups viz. low, medium and high.

Sr. No.	Innovativeness	Score
1	Low	Up to 10
2	Medium	11 to 14
3	High	Above 15

3.6.1.8 Risk preference

It was operationally defined as the degree to which Kagzi lime growers are oriented towards risk and have courage to face the problems and uncertainty in adoption of recommended technologies of Kagzi lime. It was measured with the help of scale developed by Supe (1969).

It was measured with the help of risk preference scale developed by Supe (1969). The risk preference scale includes six statements, out of this statement numbers 1 and 5 are negative and remaining statements i.e.2, 3, 4 and 6 are positive. It was worked out on five point continuum i.e. strongly agree, agree, undecided, disagree and strongly disagree and the score of 2, 3, 4 and 6 were given to the positive statement and for negative statement reserve scoring was given. On the basis of mean and standard deviation, the respondents were categorized into three groups viz. low, medium and high.

Sr. No.	Risk preference	Score
1	Low	Up to 17
2	Medium	18 to 25
3	High	Above 25

3.6.1.9 Extension contact

It means frequency of contact by the respondent with extension workers of different organization for acquiring information related to Kagzi lime technologies. The list of all possible extension workers concerned with Kagzi lime technology was prepared. The selected respondents were then asked to indicate the frequency with which they consulted to a particular extension worker for seeking information related to Kagzi lime technology. The response was rated on three point continuum i.e. always, sometime and never with numerical scores of 3,2 and 1 respectively. The scores on all the listed extension personnel was summed up and this sum total was indicative to extension contact score for particular respondent. The respondents were categorized on the basis of mean and standard deviation (Mean $\pm$ 1 S.D).

Sr. No.	Category	Score range
1	Low	Up to 21.68
2	Medium	21.69 to 26.71
3	High	Above 26.72

$\bar{X}$ = 24.2 S.D. = 2.52

3.6.1.10 Sources of information

The source of information has been operationally defined as degree of different information sources consulted by the Kagzi lime grower for seeking technical information and guidance about Kagzi lime cultivation practices.

Scoring was done on the basis of their response to the sources of information. A score of 2 to regular,1 to occasional and zero for never responses. Thus, total score for each individual was calculated and this will considered as individual source of information score. On the basis of mean and standard deviation, the respondents were categorized into three groups viz. low, medium & high.

Sr.No.	Source of information	Score
1	Low	Up to 14
2	Medium	15 to 24
3	High	Above 24

3.6.2 Dependent variables

The dependent variable in the present study was adoption behaviour. It consists of knowledge, attitude and adoption of Kagzi lime cultivation practices by farmers. The operational definition, the procedure used for quantification and categorization of these variables have been presented under this sub-head.

3.6.2.1 Knowledge

English and English (1961) defined Knowledge as a body of understood information possessed by an individual.

Knowledge is operationally defined as the body of awareness and information possessed by an individual Kagzi lime grower about released Kagzi lime technologies.

It was measured with help of teacher made knowledge test which was develop in consultation with scientists, research articles and scientific publications. The correctness of the answer was judged against predetermined answers and was given a score of 1 for correct answer and 0 for wrong answer. The sum score of all items of test for a particular grower taken as the knowledge score of that individual grower. The respondents were categorized into three groups viz. low, medium and high.

The obtained knowledge score was then converted into knowledge index with help of following formula,

$$\text{Knowledge index} = \frac{\text{Obtained knowledge score}}{\text{Maximum obtainable knowledge score}} \times 100$$

The respondent were then categorized by equal interval method as indicated below.

Sr. No.	Knowledge level	Index range
1.	Low	Up to 33.33
2.	Medium	33.34 to 66.66
3.	High	Above 66.66

3.6.2.2 Attitude

Thrustone (1946) defined, "attitude as the degree of positive or negative effect associated with some psychological object".

Thus, attitude is affective behaviour of an individual and plays a pivotal role in accepting or rejecting an innovation. It is therefore, a disposition to favour or to reject an innovation depend upon the nature of individual attitude, he reacts favourably or unfavourably.

It has been operationally defined as the degree of positive or negative reaction or bent of mind of the respondents towards the decision with regard to the adoption of Kagzi lime cultivation practices.

A teacher made attitude test was developed to measure quantitatively the attitude of respondents, towards the adoption of Kagzi lime cultivation practices. The content of attitude test was composed of statements called "items". It was measured on three point continuum viz. agree, undecided and disagree with the score of 3, 2 and 1 respectively from the positive statements while the scoring procedure was reversed for the negative statements. The score of all the items of the attitude test administered to an individual was summed up which indicated the attitude score for that particular respondent respectively. The attitude index were worked out as under

$$\text{Attitude index} = \frac{\text{Sum of attitude score actually obtained by the respondents}}{\text{Maximum possible obtainable attitude score by the respondent}} \times 100$$

The respondent were categorized on the basis of equal interval method as indicated below.

Sr. No.	Category	Index range
1.	Highly favorable	Up to 33.33
2.	Favorable	33.34 to 66.66
3.	Unfavorable	Above 66.66

3.6.2.3 Adoption

Rogers (1993) defined adoption as the decision to make full use of innovation as the best course of action available.

It has been operationally defined as degree of actual use of Kagzi lime cultivation practices by Kagzi lime growers.

It was measured with the help of teacher made test which was develop in consultation with responses of the scientist's, research articles and scientific publications. It was measured on three point continuum as full adoption, partial adoption and non-adoption by assigning the 2, 1 and 0, respectively. The adoption score were then converted into adoption index by applying following formula.

$$\text{Adoption index} = \frac{\text{Obtained adoption score}}{\text{Maximum obtainable adoption score}} \times 100$$

The respondent were then categorized by equal interval method as indicated below.

Sr. No.	Adoption level	Index range
1.	Low	Up to 33.33
2.	Medium	33.34 to 66.66
3.	High	Above 66.66

3.6.2.4 Adoption behaviour

The Adoption behaviour was conceptualized as sum total of Knowledge, attitude and adoption of Kagzi lime cultivation practices. The adoption behaviour index was taken as an average of knowledge, attitude and adoption indices as given below.

$$\text{Adoption behaviour index} = \frac{\text{Knowledge index+ Attitude index+ Adoption index}}{3} \times 100$$

The respondents were then categorized on the basis of equal interval method as indicated below.

Sr. No.	Category	Index range
1.	Low	Up to 33.33
2.	Medium	33.34 to 66.66
3.	High	Above 66.66

3.7 Tabulation and Analysis of data

The data collected through personal interview, were carefully examined for completeness and correctness. The schedule were thoroughly examined and arranged randomly and numbered serially. The scoring procedure was decided and all the data from the schedule were transferred into master table. The qualitative and quantitative classes were formed arbitrarily by using obtainable range score. The data were tabulated, frequencies and percentages in each class were worked out.

3.7.1 Arithmetic mean ($\bar{X}$)

Arithmetic mean is calculated by sum of all the individual score deviled by number of cases.

$$\bar{X} = \frac{\Sigma X}{N}$$

Where,

$\bar{X}$ = Arithmetic mean

ΣX = Sum of respondents score

N = No. of respondents

3.7.2 Standard Deviation

Standard deviation is a measure of variability calculated around mean. It is denoted by Greek tatter σ (sigma).

$$\sigma = \frac{N\Sigma X^2 - (\Sigma X)^2}{n}$$

Where,

σ – Standard deviation

ΣX^2 – Sum of square of X series

$(\Sigma X)^2$ – Square of sum of X series

N – No. of respondents

3.7.3 Coefficient of correlation:

The relationship between independent and dependent variables was calculated with the help of following given formula of coefficient of correlation.

$$r = \frac{1/N\Sigma XY - \bar{X}\bar{Y}}{\sqrt{[1/N\ \Sigma X^2 - \bar{X}^2] - [1/N\ \Sigma Y^2 - \bar{Y}^2]}}$$

Where,

r – Coefficient of correlation

ΣX – Sum of score of variable 'X'

ΣY – Sum of score of variable 'Y'

ΣXY – Sum of product of 'X' and 'Y' variables

ΣX^2 – Sum of square of 'X' variables

ΣY^2 – Sum of square of 'Y' variables

N – Total number of respondents

CHAPTER IV

RESULTS AND DISCUSSION

This chapter deals with the results obtained from the analysis of the collected data of the present study along with the discussion. The data have been analyzed taking into account the study objectives. The results of the present investigation are presented under following sections.

4.1 Profile of Kagzi lime growers

4.2 Distribution of respondents according to their level of knowledge, attitude and adoption.

4.3 Relational analysis

4.4 Constraints faced by respondents in the use of Kagzi lime cultivation practices.

4.1 Profile of the Kagzi lime growers

The study of personal, socio-economical and psychological characteristics was made with reference to age, education, land holding, annual income, experience in Kagzi lime cultivation, area under Kagzi lime crop, innovativeness, risk preference, extension contact and sources of information. The result pertaining to the characteristics have been presented under following subheads.

4.1.1 Age

Age is important factor, which determines the role of farmers in adoption behaviour of improved practices in Kagzi lime crop. The distribution of the respondents according to age was ascertained and has been presented in Table 3.

Table 3 : Distribution of the respondents according to their age

Sr. no.	Category	Respondents (n=120)	
		Number	Percentage
1.	Young	27	22.50
2.	Middle	48	40.00
3.	Old	45	37.50

The age wise distribution of the respondents in Table 3 shows that, 40.00 per cent of the kagzi lime growers were included in middle age group,

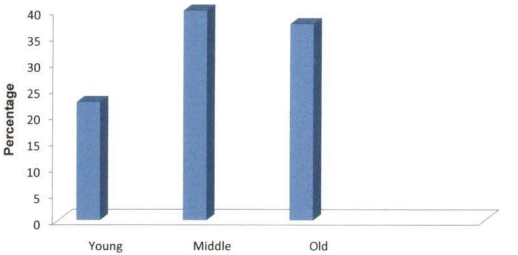

Fig. 3 . Distribution of the respondents according to their age

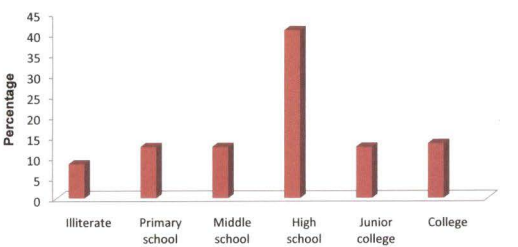

Fig. 4. Distribution of the respondents according to their education

followed by 37.50 per cent growers appeared in old age category that is above 50 years and near about one (22.50%) were in the young age group of up to 35 years.

It can be therefore concluded from the above findings that Kagzi lime growers were mostly middle age farmers.

The above findings are corroborate with the findings of Thakare (2008), Kadam *etal* (2010) and Sorate (2011).

4.1.2 Education

Education has been considered as one of the most important variable with the help of which social change can be achieved. The education of the respondents was studied and the result has been presented in Table 4.

Table 4 : Distribution of the respondents according to their education

Sr. no.	Education	Respondents (n=120)	
		Number	Percentage
1.	Illiterate	10	8.33
2.	Primary school	15	12.50
3.	Middle school	15	12.50
4.	High school	49	40.83
5.	Junior college	15	12.50
6.	College	16	13.34

It is apparent from Table 4 that, 40.83 per cent of the respondents were educated up to high school level. It was followed by college level (13.34%), whereas, the percentage of the growers who had junior college, middle school, primary school and illiterate were 12.50, 12.50, 12.50 and 8.33 per cent, respectively.

It can concluded from the above findings that most of the Kagzi lime growers were educated up to high school level education.

These findings were in consistent with the findings of Mahajan (2000), Khaire (2005), Thakare (2008) and Kadam *et al.* (2010).

4.1.3 Land holding

It is evident from Table 5, that maximum per cent of the respondents (44.17 %) belonged to category of semi-medium land holding

ranging from 2.01 to 4.00 ha. It was followed by (20.00 %) of the respondents belonging to category of medium land holding possessing land from 4.01 to 10.00ha. The growers who possessed small (1.01 to 2.00 ha.) and large (above 10 ha.) land holding were 17.50 and 9.17 per cent, respectively. Whereas only 9.16 per cent growers were possessed marginal category (up to 1.00 ha.) of land holding.

Table 5: Distribution of the respondents according to their land holding

Sr. no.	Land holding	Respondents (n=120)	
		Number	Percentage
1.	Marginal	11	9.16
2.	Small	21	17.50
3.	Semi-medium	53	44.17
4.	Medium	24	20.00
5.	Large	11	9.17

Thus, it was observed that maximum percentage of kagzi lime growers were possessing semi-medium land holding (2.01 to 4.00 ha.).

4.1.4 Area under Kagzi lime cultivation

Regarding the area under kagzi lime, it was observed from Table 6 that, majority of the growers (69.16%) put area under kagzi lime upto 1.5 ha., followed by 25.00 per cent of the growers having 1.6 to 2.9 ha of land under kagzi lime cultivation. Whereas, 5.84 per cent of kagzi lime growers were found in the category of (above 2.9 ha).

Table 6: Distribution of the respondents according to their area under Kagzi lime cultivation

Sr. no.	Area under Kagzi lime cultivation (ha)	Respondents (n=120)	
		Number	Percentage
1.	Low (Up to 1.5)	83	69.16
2.	Medium (1.6 to 2.9)	30	25.00
3.	High (Above 2.9)	7	5.84

Thus, it was observed that majority of kagzi lime growers had area under kagzi lime upto 1.5 ha.

4.1.5 Annual income

The annual income of the growers was studied and the result has been presented in Table 7.

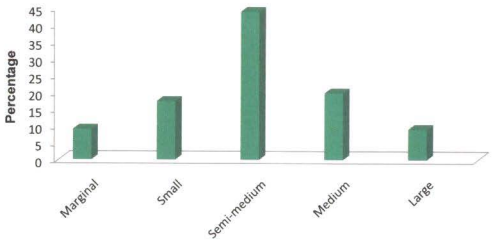

Fig. 5. Distribution of the respondents according to their land holding

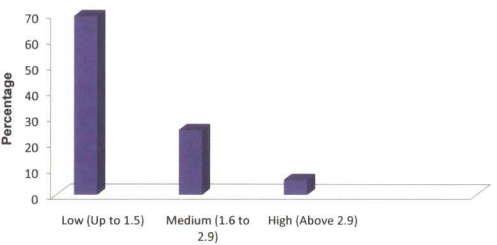

Fig. 6. Distribution of the respondents according to their area under kagzi lime cultivation

Table 7: Distribution of the respondents according to their annual income

Sr. no.	Annual income (Rs.)	Respondents (n=120)	
		Number	Percentage
1.	Up to 2,00,000	45	37.50
2.	2,00,001 to 4,00,000	58	48.33
3.	Above 4,00,001	17	14.16

From the distribution of respondents according to annual income in Table 7, it may be noted that majority of the respondents (48.33%) had annual income between 2,00,001 to 4,00,000. It was followed by (37.50%) respondents who were found to have annual income up to 2,00,000. The respondents having annual income above 4,00,001 were found to be 14.16 per cent.

From the above findings it can be concluded that, maximum number of the respondents (48.33%) were having their annual income ranging from Rs.2, 00,001 to Rs.4, 00,000/-.

These findings are in consistent with findings of Vijayakumar (1997).

4.1.6 Experience in Kagzi lime cultivation

The distribution of the respondents according to their experience in kagzi lime cultivation is shown in Table 8.

Table 8 : Distribution of the respondents according to their experience in Kagzi lime cultivation

Sr. no.	Category	Respondents (n=120)	
		Number	Percentage
1.	Low (Up to 6)	36	30.00
2.	Medium (7 to 9)	72	60.00
3.	High (Above 9)	12	10.00

It is apparent from Table 8 it could be noticed that relatively higher proportion (60.00%) of respondents having 7 to 9 years of experience in Kagzi lime cultivation, followed by 30.00 per cent of the respondents having up to 6 years of experience in Kagzi lime cultivation. However 10.00 per cent of respondents had above 9 years of experience in Kagzi lime cultivation.

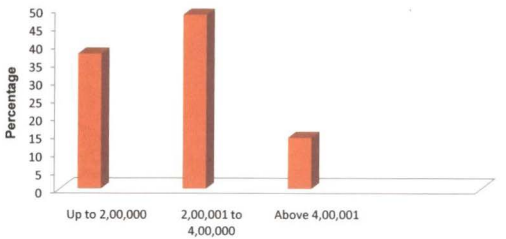

fig. 7. Distribution of the respondents according to their annual income

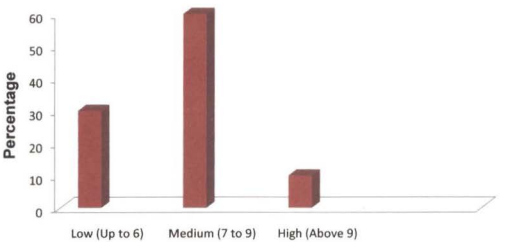

Fig. 8. Distribution of the respondents according to their experience in Kagzi lime cultivation

Thus, it could be concluded that majority of kagzi lime growers had medium experience (7 to 9) under kagzi lime.

These findings were corroborating with the findings of Gangurde (2003), Karale (2006) Thakare (2008).

4.1.7 Innovativeness

The distribution of the growers according to their innovativeness is shown in Table 9.

Table 9: Distribution of the respondents according to their level of innovativeness

Sr. no.	Category	Respondents (n=120)	
		Number	Percentage
1.	Low	35	29.16
2.	Medium	75	62.50
3.	High	10	8.34

It is apparent from Table 9 that, majority of the respondents (62.50 %) were included in medium category of innovativeness. It was followed by 29.16 per cent of the respondents who were included in the low innovativeness category and only 8.34 per cent respondents were included in the category of high innovativeness.

Thus, it could be inferred that, majority of the kagzi lime growers (62.50%) were having high level of innovativeness.

4.1.8 Risk preference

The distribution of the kagzi lime growers according to their risk preference is shown in Table 10.

Table 10: Distribution of the respondents according to their risk preference

Sr. no.	Category	Respondents (n=120)	
		Number	Percentage
1.	Low	19	15.84
2.	Medium	86	71.66
3.	High	15	12.50

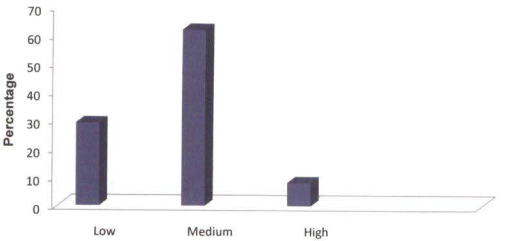

fig. 9. Distribution of the respondents according to their level of innovativeness

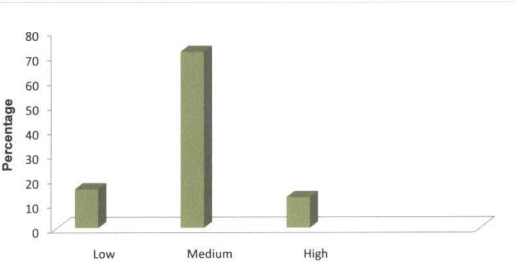

Fig. 10. Distribution of the respondents according to their risk preference

It is evident from Table 10 that maximum per cent of the respondents (71.66%) was observed under medium risk preference category. This was followed by 15.84 per cent of respondents who were under low risk preference category and 12.50 per cent of the kagzi lime growers were observed under high risk preference category.

Thus, it could be inferred that, majority of the kagzi lime growers (71.66%) were observed under high risk category.

4.1.9 Extension contact

As regards the extension contact the distribution of the respondents in Table 11 showed that 68.34 per cent of respondents were found in medium category of extension contact. As much as 17.50 per cent of the respondents found to be having high level of extension contact and 14.16 per cent of the respondents were found to be keeping lower level of contact with various extension workers for acquisition of information about Kagzi lime cultivation practices. In general, higher percentage of respondents had medium level of contact with extension personnel for obtaining information about Kagzi lime cultivation practices.

Table 11: Distribution of the respondents according to their extension contact

Sr. no.	Category	Respondents (n=120)	
		Number	Percentage
1.	Low	17	14.16
2.	Medium	82	68.34
3.	High	21	17.50

$\bar{x}$ = 24.2 S.D. = 2.52

Thus, from above table it was observed that majority of the growers having medium extension contact about kagzi lime cultivation practices.

4.1.10 Sources of information

The individual is likely to use different sources for getting information about recommended kagzi lime cultivation practices.

Table 12: Distribution of respondents according to their different type of sources of information

Sr. No.		Source of information	Always	Sometimes	Never
(A)		**Personal sources**			
	1	Neighboures	95 (79.16%)	22 (18.34%)	03 (2.50%)
	2	Friends	94 (78.34%)	24 (20.00%)	02 (1.66%)
	3	Relatives	91 (75.84%)	24 (20.00%)	05 (4.16%)
	4	Progressive farmers	91 (75.84%)	24 (20.00%)	05 (4.16%)
	5	Gram Panchayat Members	24 (20.00%)	72 (60.00%)	24 (20.00%)
	6	Local leader	65 (54.17%)	54 (45.00%)	01 (00.83%)
B		Impersonal Sources			
	1	Gram Sevak	48 (40.00%)	47 (39.17%)	25 (20.83%)
	2	Krishi Sevak	52 (43.34%)	66 (55.00%)	02 (1.66%)
	3	Agricultural Supervisor	15 (12.50%)	63 (52.50%)	42 (35.00%)
	4	Agriculture Officer	24 (20.00%)	84 (70.00%)	12 (10.00%)
	5	Agriculture Extension Officer	32 (26.67%)	69 (57.50%)	19 (15.83%)
	6	Agriculture University / KVK Scientist	77 (64.17%)	40 (33.33%)	03 (2.50%)
	7	Group Discussion	71 (59.17%)	41 (34.17%)	08 (6.66%)
	8	Training	36 (30.00%)	66 (55.00%)	18 (15.00%)
	9	Demonstration	21 (17.50%)	63 (52.50%)	36 (30.00%)
	10	Tour	40 (33.33%)	55 (45.83%)	25 (20.84%)
	11	Participation in Agriculture Exhibition	26 (21.66%)	62 (51.67%)	32 (26.64%)
(C)		**Mass media sources**			
	1	Radio	83 (69.17%)	35 (29.17%)	02 (1.66%)

	2	Television	95 (79.17%)	22 (18.33%)	03 (2.50%)
	3	Newspaper	63 (52.51%)	56 (46.66%)	01 (0.83%)
	4	Agriculture literature (Magazine / Publications)	16 (13.34%)	57 (47.50%)	47 (39.16%)
	5	Seminar	20 (16.67%)	64 (53.33%)	36 (30.00%)
	6	Internet	20 (16.67%)	36 (30.00%)	64 (53.33%)
(D)		**Trade Organizations**			
	1	Agriculture producer marketing committee	38 (31.67%)	53 (44.17%)	29 (24.16%)
	2	Authorized dealer (Fertilizer, Insecticides, Seed)	95 (79.17%)	22 (18.33%)	03 (2.50%)
	3	Co-operative society	66 (55.00%)	42 (35.00%)	12 (10.00%)
	4	Other	00 (00.00%)	60 (50.00%)	60 (50.00%)

The data regarding use of various source of information by the kagzi lime growers for seeking information about improved kagzi lime cultivation practices in general and recommended practices of cultivation in particular is presented in Table 12. Among the personal contact majority of the respondents were found to be contacting the neighbors (79.16%), friends (78.34%), relatives (75.84%), progressive farmers (75.84%),agriculture officer (70.00%), agriculture Universities (64.17%) and local leaders (54.17%), with regards to sometimes contacted for acquiring information about kagzi lime cultivation technologies agriculture supervisor (52.50%), comparatively less per cent of the respondents were not contacted by majority (50.83%) of the respondents for getting the information about kagzi lime cultivation practices.

In case of group sources, majority (59.17%) of the kagzi lime growers tried to acquire information from group discussion followed by training (30.00%), tour (33.33%) participation in agricultural exhibition(21.66%) and few (17.50%) through demonstration.

More than half of the respondent (55.00%), (52.50%) and (51.67%) were sometime acquired technical information sometimes through

training, demonstration and agricultural exhibition respectively. Where as comparatively less number of respondents were never acquired the information from different group sources.

Amongst mass media sources, majority of the respondents tried to acquire the information frequency from television (79.17%) by exposing farm television programme on many media channels of mass communication and followed by radio (69.17%) by exposing to farm radio programme. However, majority of the respondents not tried to internet (53.33%), agricultural literature (39.16%) and seminars (30.00%) for getting the information about kagzi lime cultivation practices and technologies.

Amongst the trade organizations, majority of the respondents always tried to acquire the information from authorized dealer (79.17%)followed by contacted co-operative comparatively more than half (55.00%),agricultural produce marketing committee (31.66%) and sometimes from other organization (50.00%).

The above results tends to the conclusion that, most of the respondents used to obtain information about technologies of kagzi lime cultivation through mass media sources like TV (79.17%) and other sources like friends (78.33%), relatives (75.83%), group discussion (59.16%), training (30.00%), television (79.16%) and radio (69.16%) of mass communication and in the organization trade authorized dealers (79.16%), sometime co-operative organization (55.00%) agricultural producer marketing committee (44.16%), from these sources respondents get more information about various technologies and kagzi lime cultivation practices.

The individual is likely to use different sources for getting information about recommended Kagzi lime cultivation practices. The frequency of use of various sources of information about adoption of recommended cultivation practices by Kagzi lime growers is shown in Table 13.

Table 13: Distribution of the respondents according to sources of information

Sr. no.	Category	Respondents (n=120)	
		Number	Percentage
1.	Low	27	22.50
2.	Medium	78	65.00
3.	High	15	12.50

It is observed from Table 13 that majority of the respondents (65.00%) were having medium sources of information. While, (22.50%) of the respondents were having low sources of information and 12.50 per cent of the respondents were having high sources of information about Kagzi lime cultivation.

The similar findings were reported by Karale (2006) and Sorate (2011).

4.2 Distribution of respondents on knowledge, attitude, adoption and adoption behaviour

The dependent variable in the present study is adoption behaviour which consists of knowledge, attitude and adoption. The results pertaining to these components of adoption behaviour have been presented in this section.

4.2.1 Knowledge

Adequate and relevant knowledge of Kagzi lime cultivation by the Kagzi lime growers has relevance in obtaining maximum benefit through production. Looking to the importance of knowledge, respondents knowledge was studied practice wise and the data in this regards has been presented in Table 14.

Table 14 : Practice wise distribution of the respondents according to their knowledge about Kagzi lime cultivation

Sr. no.		Cultivation practices	Knowledge	
A		Practices	Frequency	Percentage
	1	Soil recommended for Kagzi lime cultivation (medium black,light, friable, free drainage.)	102	85.00%
	2	Land preparation(ploughing, harrowing etc.)	98	81.66%
B		Variety		
	1	Recommended variety for Kagzi lime	112	93.33%

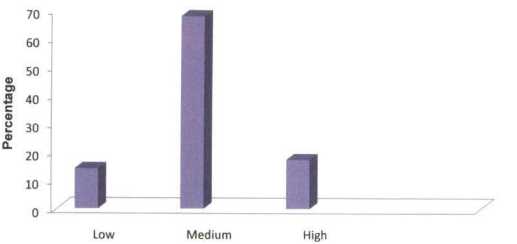

Fig. 11 . Distribution of the respondents according to their extension contact

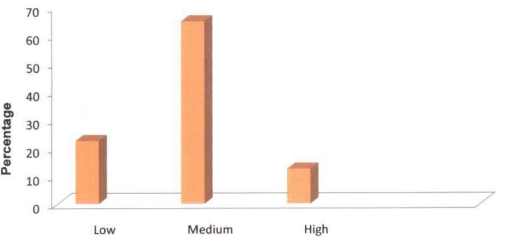

Fig. 12. Distribution of the respondents according to sources of information

		cultivation(Pramalini, Vikram, PDKV Lime etc.)		
	2	Characteristics of Kagzi lime crop variety	93	77.50%
	3	Source of planting material	85	70.83%
C		**Propagation**		
	1	Method of propagation(seedling)	79	65.83%
D		**Spacing**		
	1	Recommended Spacing (6X6) and (5x5)	113	94.16%
	2	Kagzi lime plant population [277 plants/ha (6x6m) and 400 plants/ha (5x5m)]	82	68.33%
E		**Training**		
	1	Type of training	51	42.50%
F		**Prunning**		
	1	Time of prunning	75	62.50%
G		**Bahar treatments**		
	1	Different bahars of Kagzi lime (Hasta, Mrig and Ambia bahar.)	104	86.66%
H		**Organic manure**		
	1	Recommended dose of FYM	79	65.83%
I		**Fertilizer application**		
	1	Recommended dose of fertilizer (450+225+225 g NPK./plant)	65	54.16%
J		**Irrigation**		
	1	Method of irrigation (Double ring method)	46	38.33%
K		**Plant protection**		
	1	Major pest(fruit sucking moth, citrus bark eating caterpillar,citrus black fly etc.)	77	64.16%
	2	Recommended insecticides (monochrotophos 36% EC, quionolphos 25% EC, Cypermethrin 25% EC, spray of acephate etc.)	82	68.33%
	3	Major diseases (canker, khaira)	87	72.50%
	4	Recommended chemicals (copper oxychloride 0.3% and 100 ppm streptocyclin)	57	47.50%
L		**Harvesting**		
	1	Stage of harvesting	102	85.00%
M		**Marketing**		
	1	Size of Kagzi lime fruit (large)	68	56.66%
N		**Post harvest technology**		
	1	Processed products of Kagzi lime	89	74.16%

From Table 14, it is revealed that, with respect to land preparation large majority of the respondents (85.00 %) and (81.66 %) were having knowledge about type of soil selection of kagzi lime cultivation and practices necessary for land preparation, respectively.

In case of variety use, great majority of respondents (93.33 %) were having knowledge about varieties recommended in the study area whereas, 77.50 per cent and 70.83 per cent of them were having knowledge about characteristics of recommended varieties and source of planting material, respectively.

With regards to propagation, planting and spacing, 65.83 per cent of the respondents possessed knowledge about propagation. As concerned to spacing, the respondents (94.16 %) and (68.33 %) were having knowledge about recommended spacing and optimum kagzi lime plant population, respectively.

The majority of the respondents (42.50%) and (62.50%) possessed knowledge about type of training type and pruning time, respectively.

With respect to bahar treatments majority (86.66%) of the respondents possessed knowledge about bahar treatments in kagzi lime.

As concerned to the organic manures, maximum number of the respondents (65.83%) were having knowledge of recommended dose of FYM application.

With respect to fertilizer application, majority (54.16 %) of the respondents possessed knowledge about recommended dose of fertilizers.

The majority of the respondents (38.33 %) were possessed knowledge about suitable method of irrigation in the study area.

In case of plant protection, majority of the respondents (64.16%), (68.33 %), (72.50 %) and (47.50 %) were possessed knowledge about major pests of kagzi limes (citrus black fly, citrus bark eating caterpillar etc.), insecticides recommended for control of pests, major disease (bacterial canker) and chemical recommended for control of disease, respectively.

As regards harvesting and marketing, 85.00 per cent and 56.66 per cent of the respondents were having knowledge about appropriate stage of harvesting of kagzi lime and size suitable for marketing (large).

The majority of the respondents (74.16 %) were possessed knowledge about processed products of kagzi lime.

4.2.1.1 Knowledge index

Adequate and relevant knowledge of recommended cultivation practices of Kagzi lime is very important for the Kagzi lime growers in receiving maximum benefits through production. Looking to the importance of knowledge, respondents knowledge about recommended practices of Kagzi lime cultivation have been studied and the data in this regard have been presented in Table 15.

Table 15 : Distribution of the respondents according to knowledge level

Sr. no.	Knowledge level	Respondents (n=120)	
		Number	Percentage
1.	Low	15	12.50
2.	Medium	87	72.50
3.	High	18	15.00

The knowledge possessed by the Kagzi lime growers indicated that most of the respondents (72.50%) were having medium level of knowledge of Kagzi lime cultivation while, 15.00 per cent of the respondents having low level of knowledge of Kagzi lime cultivation and remaining 12.50 per cent of the respondents having high level of knowledge of Kagzi lime cultivation.

Thus is can be inferred that majority of the respondents were having medium level of knowledge about Kagzi lime cultivation practices.

4.2.2 Attitude

An Attitude indicates the positive or negative feeling of the individual respondent towards scientific production of Kagzi lime. The attitude also reflects on actual use of recommended practices of Kagzi lime. Therefore this variable was selected for the study.

An attempt has been made to place the respondents as per the their attitude towards Kagzi lime cultivation which was studied on three point continuum i.e. Agree, Undecided and Disagree and result are given in Table 16.

Table 16: Distribution of the respondents according to their attitude towards Kagzi lime cultivation practices.

Sr.No.	Attitude statements	AG	UD	DA
1	Kagzi lime cultivation is beneficial over other field crops	82 (68.33%)	33 (27.50%)	05 (4.17%)
2	Kagzi lime cultivation is risky than the other crops	79 (65.83%)	27 (22.50%)	14 (11.67%)
3	There are large limitations on the Kagzi lime cultivation	77 (64.16%)	35 (29.17%)	08 (6.67%)
4	Kagzi lime cultivation required technical skill	91 (75.83%)	26 (21.67%)	03 (2.50%)
5	One can get more profit if he/sheundertake take Kagzi lime cultivation	52 (43.33%)	39 (32.51%)	29 (24.16%)
6	I don't consider Kagzi lime cultivation as creditable income generation	33 (27.50%)	48 (40.00%)	39 (32.50%)
7	Kagzi lime cultivation is not possible to ordinary farmer	35 (29.16%)	59 (49.17%)	26 (21.67%)
8	Kagzi lime cultivation required high initial cost	58 (48.33%)	44 (36.67%)	18 (15.00%)
9	Kagzi lime growing has helped to the rural youths in increasing the employment status in rural area	34 (28.33%)	58 (48.34%)	28 (23.33%)

AG- Agree UD- Undecided DA- Disagree

From table 16, it is revealed that majority of respondents were agreed with the statements such as, Kagzi lime cultivation required technical skill (75.83%), followed by Kagzi lime cultivation is beneficial over other field crops (68.33%), Kagzi lime cultivation is risky than the other crops (65.83%),

there are large limitations on the Kagzi lime cultivation(64.16%), Kagzi lime cultivation required high initial cost (48.33%), one can get more profit if he/she undertake Kagzi lime cultivation (43.33%), Kagzi lime cultivation is not possible to ordinary farmer (29.16%), Kagzi lime growing has helped in the rural youths in increasing the employment status in rural area (28.33%),i don't consider Kagzi lime cultivation as creditable income generation(27.50%).

It is also evident from the data depicted in Table 16, that majority of the respondents had favourable attitude towards the statements such as, Kagzi lime cultivation is not possible to ordinary farmer (49.17%),followed by Kagzi lime growing has helped in the rural youths in increasing the employment status in rural area (48.34%), I don't consider Kagzi lime cultivation as creditable income generation (40.00%), Kagzi lime cultivation required high initial cost (36.67%), One can get more profit if he/she undertake take Kagzi lime cultivation (32.50%), There are large limitations on the Kagzi lime cultivation (29.17%), Kagzi lime cultivation is beneficial over other field crops (27.50%), Kagzi lime cultivation is risky than the other crops (22.50%), Kagzi lime cultivation required technical skill (21.67%).

With regards to disagree feelings, it is revealed that relatively less proportion of respondents were said that, I don't consider Kagzi lime cultivation as creditable income generation (32.51%), followed by one can get more profit if he/she undertake take Kagzi lime cultivation (24.16%), Kagzi lime growing has helped in the rural youths in increasing the employment status in rural area (23.33%), Kagzi lime cultivation is not possible to ordinary farmer(21.67%), Kagzi lime cultivation required high initial cost (15.00%), Kagzi lime cultivation is risky than the other crops (11.67%), There are large limitations on the Kagzi lime cultivation (6.67%), Kagzi lime cultivation is beneficial over other field crops (4.17%),Kagzi lime cultivation required technical skill (2.50%).

Collectively, it could be said that, Kagzi lime growers were having somewhat favourable attitude towards Kagzi lime cultivation.

4.2.2.1 Attitude index

The attitude of the respondents towards kagzi lime cultivation practices was ascertained and the results obtained are reported in Table 17.

Table 17: Distribution of the respondents according to their Attitude level towards Kagzi lime cultivation practices

Sr. No.	Attitude levels	Respondents (n=120)	
		Number	Percentage
1.	Less favorable	28	23.33
2.	Favorable	77	64.16
3.	Highly favorable	15	12.50

It can be seen from Table 17 that, majority (64.16%) of the respondents had favorable attitude towards Kagzi lime cultivation practices, followed by nearly one fifth (23.33%) of the respondents showed less favorable attitude towards Kagzi lime cultivation practices. However, only 12.50 per cent were having highly favorable attitude towards the Kagzi lime cultivation.

4.2.3 Adoption

Adoption shows the present state of actual use of cultivation practices of Kagzi lime crop by the farmers.

Table 18 : Practice wise distribution of the respondents according to their adoption of Kagzi lime cultivation

Sr. no.		Cultivation practices	Adoption		
			CA	PA	NA
A	1	Soil recommended for Kagzi lime cultivation (medium black, light friable, loamy soil)	85 (70.83%)	19 (15.83%)	16 (13.34%)
	2	land preparation(ploughing, harrowing)	75 (62.50%)	35 (29.16%)	10 (8.34%)
B		**Variety**			
	1	Recommended variety for Kagzi lime cultivation(Pramalini, Vikram, PDKV lime)	85 (70.83%)	20 (16.66%)	15 (12.51%)
C		**Propagation**			
	1	Method of propagation(seedling)	80 (66.66%)	25 (20.83%)	15 (12.51%)
D		**Spacing**			
	1	Recommended Spacing(6×6 and 5x5 m)	95 (79.16%)	20 (16.66%)	05 (4.18%)

	2	Kagzi lime plant population [277plants/ha (6x6m) and 400plants/ha(5x5m)]	80 (66.66%)	32 (26.66%)	08 (6.68%)
E		**Training**			
	1	Type of training	70 (58.33%)	35 (29.16%)	15 (12.51%)
F		**Prunning**			
	1	Time of pruning	32 (26.66%)	60 (50.00%)	28 (23.34%)
G		**Bahar treatments**			
	1	Different bahars of Kagzi lime(hasta, mrig and ambia bahar)	98 (81.66%)	12 (10.00%)	10 (8.34%)
H		**Organic manure**			
	1	Recommended dose of FYM	70 (58.33%)	25 (20.83%)	25 (20.84%)
I		**Fertilizer application**			
	1	Recommended dose of fertilizer (450+225+225 g NPK/plant)	44 (36.66%)	52 (43.33%)	24 (20.01%)
J		**Irrigation**			
	1	Method of irrigation(Double ring method)	52 (43.33%)	47 (39.16%)	21 (17.51%)
	2	Critical growth stage for irrigation	58 (48.33%)	38 (31.66%)	24 (20.01%)
K		**Plant protection**			
	1	Recommended insecticides (monochrotophos 36% EC, quionolphos 25% EC, Cypermethrin 25% EC, spray of acephate etc.)	89 (74.16%)	24 (20.00%)	07 (5.84%)
	2	Recommended chemicals (copper oxychloride 0.3% and 100 ppm streptocyclin)	75 (62.50%)	33 (27.50%)	12 (10.00%)
L		**Harvesting**			
	1	Stage of harvesting	95 (79.16%)	15 (12.50%)	10 (8.34%)
M		**Marketing**			
	1	Size of Kagzi lime fruit(large)	68 (56.66%)	35 (29.16%)	17 (14.18%)
N		**Post harvest technology**			
	1	Processed products of Kagzi lime (squash, juice, pickle etc.)	90 (75.00%)	21 (17.50%)	09 (7.50%)

CA – Complete adoption PA – Partial adoption

NA – No adoption

From Table 18, it is revealed that, with respect to land preparation majority of the respondents (62.50 %) and (70.83 %) were complete adoption

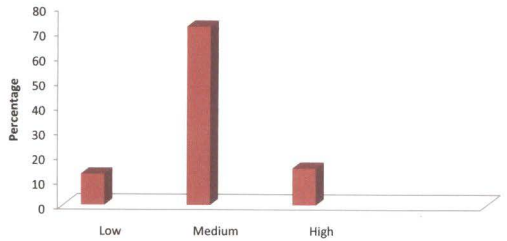

Fig. 13. Distribution of the respondents according to knowledge level

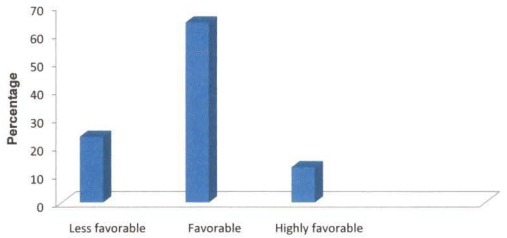

Fig. 14. Distribution of the respondents according to their Attitude towards Kagzi lime cultivation practices

about type of soil selection of Kagzi lime cultivation and practices necessary for land preparation respectively.

In case of variety use, maximum numbers of respondents (70.83 %) were observed in complete adoption of recommended varieties such as PDKV lime and Vikram.

With regards to propagation and spacing, 66.66 per cent of the respondents possessed complete adoption about propagation of Kagzi lime crop. As concerned to spacing, the respondents (79.16 %) and (66.66 %) were having complete adoption about recommended spacing and optimum Kagzi lime population respectively.

Relatively higher proportion of the respondents (58.33 %)were having complete adoption type of training and (50.00%) possessed partial adoption about type of prunning time.

With regards to bahar treatments, 81.66 per cent of the respondents possessed complete adoption about bahar treatments in Kagzi lime crop.

As concerned to the organic manures (FYM), maximum number of the respondents (58.33%) complete adoption of organic manure.

With respect to fertilizer application majority (43.33 %) of the respondents possessed partial adoption about recommended dose of fertilizers.

Nearly half of the respondents (43.33 %) and (48.33 %) were adopted recommended method of irrigation and critical growth stage of irrigation in the study area.

In case of plant protection measures, higher proportion of the respondents (74.16 %), and (62.50 %) were possessed complete adoption about insecticides recommended for control of pests (citrus fruit sucking moth, citrus bark eating caterpillar etc.) and major disease (citrus canker), respectively.

As regards harvesting and marketing 79.16 per cent and 56.66 per cent of the respondents were complete adoption about appropriate stage of harvesting of Kagzi lime and size suitable for marketing (large).

4.2.3.1 Adoption index

Adoption is decision making process and important to the Kagzi lime growers in receiving maximum production from Kagzi lime crop. Looking to the importance o adoption, respondents adoption about Kagzi lime crop have been studied and the data in this regard have been presented in Table 19.

Table 19: Distribution of the respondents according to adoption level

Sr. no.	Adoption level	Respondents (n=120)	
		Number	Percentage
1.	Low	23	19.17
2.	Medium	71	59.17
3.	High	26	21.66

It was observed from Table 19 that most of the respondents (59.17%) had medium level of adoption of Kagzi lime cultivation practices while, 19.17 per cent of the respondents were having low level of adoption, where as only 21.66 per cent respondents were having high level of adoption.

Thus it can be inferred that most of the respondents were grouped in medium level of adoption about Kagzi lime cultivation practices.

These findings were in conformity with the findings of Thakare (2008).

4.2.4 Adoption behaviour

The composite adoption behaviour of respondents was work out and the results presented in Table 20. The distribution in Table 20 reveals that little less than two third of the respondents (65.00%) exhibited medium level of adoption behaviour about Kagzi lime cultivation followed by little less than one fifth of them (18.33%) were observed in low level of adoption of adoption behavior. The respondents found to have high level of adoption behaviour were 16.67 per cent.

This indicates that there is again scope for improvement in adoption behaviour of farmers about Kagzi lime cultivation practices wthich can be achieved through imparting favorable attitude and motivating the farmers through demonstration, field visits etc.

Table 20: Distribution of the respondents according to their adoption behaviour

Sr. no.	Adoption behaviour	Respondents (n=120)	
		Number	Percentage
1.	Low	22	18.33
2.	Medium	78	65.00
3.	High	20	16.67

From the above findings it can be concluded that, majority of the respondents were observed in medium level of adoption behavior.

4.3 Relationship between selected characteristics and adoption behaviour about cultivation practices of Kagzi lime growers

Efforts have also been made to find out the relationship of selected characteristics of Kagzi lime growers with their knowledge, attitude, adoption and adoption behaviour of recommended cultivation practices. The correlation of independent variables with the dependent variable was worked out and tested for its significance.

4.3.1 Relationship of selected characteristics of Kagzi lime growers with their knowledge

The correlation coefficients of knowledge of Kagzi lime growers towards the Kagzi lime cultivation practices with independent variables have been depicted in Table 21.

It could be seen from Table 21 that among the selected variables, annual income and experience in kagzi lime cultivation practices were positively and highly significantly correlated with the knowledge of Kagzi lime cultivation practices. The variables namely land holding and sources of information were positively and significantly correlated with the knowledge of cultivation practices of kagzi lime. Therefore, the null hypothesis was rejected for this variable. The variables such as age, education, area under Kagzi lime cultivation, innovativeness, risk preference and extension contact were having non- significant relationship with knowledge of recommended Kagzi lime

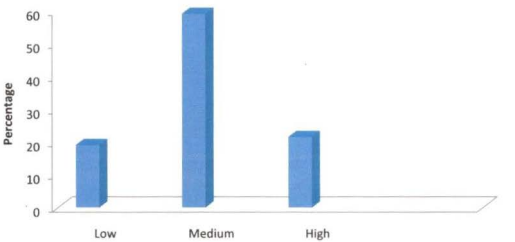

Fig. 15. Distribution of the respondents according to adoption level

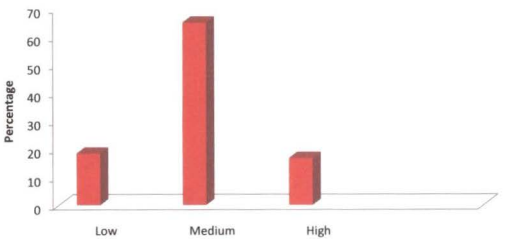

Fig. 16. Distribution of the respondents according to their adoption behaviour

cultivation practices. Therefore, the null hypothesis was accepted for these variables.

Table 21: Coefficient of correlation of selected characteristics of the respondents with their knowledge

Sr. No.	Variable	Knowledge 'r' value
1	Age	0.0111 ^{NS}
2	Education	0.1878 ^{NS}
3	Land holding	0.1982*
4	Area under Kagzi lime cultivation	0.0638 ^{NS}
5	Annual income	0.2137 **
6	Experience in Kagzi lime cultivation	0.2663**
7	Innovativeness	0.1308 ^{NS}
8	Risk preference	0.0354 ^{NS}
9	Extension contact	0.1148^{NS}
10	Sources of information	0.1995*

NS – Non-significant
*- Significant at 0.05 level of probability
**- Significant at 0.01 level of probability

4.3.2 Relationship of selected characteristics of Kagzi lime growers with their attitude

The correlation coefficients of attitude of Kagzi lime growers towards the Kagzi lime cultivation practices with independent variables have been depicted in Table 22.

Table 22: Coefficient of correlation of selected characteristics of the respondents with their attitude

Sr. No.	Variable	Attitude 'r' value
1	Age	0.0438 ^{NS}
2	Education	0.2075**
3	Land holding	0.0912 ^{NS}
4	Area under Kagzi lime cultivation	0.2114**
5	Annual income	0.2328**
6	Experience in Kagzi lime cultivation	0.0081 ^{NS}
7	Innovativeness	0.0758 ^{NS}
8	Risk preference	0.1523 ^{NS}
9	Extension contact	0.1773 ^{NS}
10	Sources of information	0.2015*

NS – Non-significant
*- Significant at 0.05 level of probability
**- Significant at 0.01 level of probability

It could be seen from Table 22 that among the selected variables education, area under kagzi lime and annual income were positively and highly significantly correlated with the attitude towards kagzi lime cultivation practices. The variable sources of information was positively and significantly correlated with the attitude toward kagzi lime cultivation practices. Therefore, the null hypothesis was rejected for these variables. The variables such as age, land holding, experience in kagzi lime cultivation, innovativeness, risk preference and extension contact were having non-significant relationship with attitude towards recommended kagzi lime cultivation practices. Therefore, the null hypothesis was accepted for the variables age, land holding, experience in kagzi lime cultivation, innovativeness, risk preference and extension contact.

4.3.3 Relationship of selected characteristics of Kagzi lime growers with their adoption

The correlation coefficients of adoption of Kagzi lime growers towards the Kagzi lime cultivation practices with independent variables have been depicted in Table 23.

Table 23: Coefficient of correlation of selected characteristics of the respondents with their adoption

Sr. No.	Variable	Adoption 'r' value
1	Age	0.0733 ^{NS}
2	Education	0.0333 ^{NS}
3	Land holding	0.2387**
4	Area under Kagzi lime cultivation	0.2198**
5	Annual income	0.1992*
6	Experience in Kagzi lime cultivation	0.2283**
7	Innovativeness	0.0147 ^{NS}
8	Risk preference	0.1780 ^{NS}
9	Extension contact	0.1429^{NS}
10	Sources of information	0.2028*

NS – Non-significant

*- Significant at 0.05 level of probability

**- Significant at 0.01 level of probability

It can be seen from Table 23 that among the selected variables land holding, area under Kagzi lime cultivation and experience in kagzi lime cultivation practices were positively and highly significantly correlated with the adoption of recommended cultivation practices of Kagzi lime. The variables namely annual income and sources of information were also positively and significantly correlated with the adoption of recommended cultivation practices of Kagzi lime. Therefore, the null hypothesis was rejected for these variables and it indicated that the respondents had adoption about recommended cultivation practices of Kagzi lime. The variables namely age, education, innovativeness, risk preference and extension contact were having non-significant relationship with adoption towards Kagzi lime cultivation practices therefore, the null hypothesis was accepted for these variables.

4.3.4 Correlates and determinants of Adoption behaviour

An attempt was made to study the adoption behaviour comprising of knowledge, attitude and adoption. The correlation coefficient of adoption behaviour with independent variables have been depicted in Table 24.

It could be seen from Table 24 that amongst selected variables area under Kagzi lime cultivation, annual income and experience in Kagzi lime cultivation were positively and highly significantly correlated with the adoption behavior at 0.01 level of probability. Therefore, the null hypothesis was rejected for these variables. The variables such as education, land holding and sources of information was positively and significantly correlated with adoption behavior at 0.05 level of probability. Therefore, the null hypothesis was rejected for these variables.

The variables age, innovativeness, risk preference and extension contact were having non-significant relationship with adoption behaviour of farmers towards cultivation practices of Kagzi lime. Therefore, the null hypothesis was accepted for these variables.

Table 24: Coefficient of correlation of selected characteristics of the respondents with their adoption behaviour

Sr. No.	Variable	Adoption behavior 'r' value
1	Age	0.0226 ^{NS}
2	Education	0.2012*
3	Land holding	0.1993*
4	Area under Kagzi lime cultivation	0.2759**
5	Annual income	0.2089**
6	Experience in Kagzi lime cultivation	0.2074**
7	Innovativeness	0.1145 ^{NS}
8	Risk preference	0.0705 ^{NS}
9	Extension contact	0.0567^{NS}
10	Sources of information	0.1999*

NS – Non-significant

*- Significant at 0.05 level of probability

**- Significant at 0.01 level of probability

4.4 Constraints

In the present study constraints referred to problems or difficulties faced by individual respondents in adoption of recommended Kagzi lime cultivation practices. The relevant data in this regard has been presented in Table 25.

Table 25 : Distribution of respondents according to their constraints faced during Kagzi lime cultivation

Sr. No.	Constraints	Respondents	
		Number	Percentage
A.	**Cultivation constraints**		
1	Inadequate and timely availability of fertilizers	75	62.50
2	High cost of inorganic fertilizers and micronutrients	80	66.66
3	Shortage of irrigation water during summer	85	70.83
4	Problems in identification of diseases and pest	60	50.00
5	High cost of pesticides and fungicides	70	58.33
6	Jumbling while selecting pesticides and fungicides	90	75.00
7	High wages of labour	50	41.66
B.	**Technical constraints**		
1	Lack of knowledge about recommended technology	70	58.33

2	Lack of knowledge about fertilizer management	80	66.66
3	Lack of knowledge about plant protection measures	75	62.50
4	Lack of knowledge about use of different plant growth regulators i.e. GA.	95	79.16
5	Lack of timely guidance	80	66.66
C.	**Financial constraints**		
1	Inadequate sources of finance	70	58.33
2	Non-availability of money in time	85	70.83
D.	**Marketing constraints**		
1	Low rates of Kagzi lime fruits	80	66.66
2	Fluctuation in market rates	80	66.66
3	No guarantee of payment received from merchants	75	62.50

From Table 25 it has been revealed that 79.16 per cent of the respondents expressed lack of knowledge about use of different plant growth regulators, followed by jumbling while selecting pesticides and fungicides (75.55%), shortage of irrigation water during summer (70.83%), non-availability of money in time (70.83%), high cost of inorganic fertilizers and micronutrients (66.66%), lack of knowledge about fertilizer management (66.66%),lack of timely guidance(66.66%),low rates of Kagzi lime fruits(66.66%),fluctuation in market rates (66.66%),inadequate and timely availability of fertilizers (62.50%), lack of knowledge about plant protection measures (62.50%), no guarantee of payment received from merchants (62.50%), high cost of pesticides and fungicides (58.33%), lack of knowledge about recommended technology(58.33%), inadequate sources of finance (58.33%), problems in identification of diseases and pest (50.00%), high wages of labour (41.66%).

4.5 Empirical research model

Considering the tested relations amongst the independent and dependent variables the empirical model was prepared and the relationship has been depicted in fig.17. The empirical model shows the observed relation of independent variables.

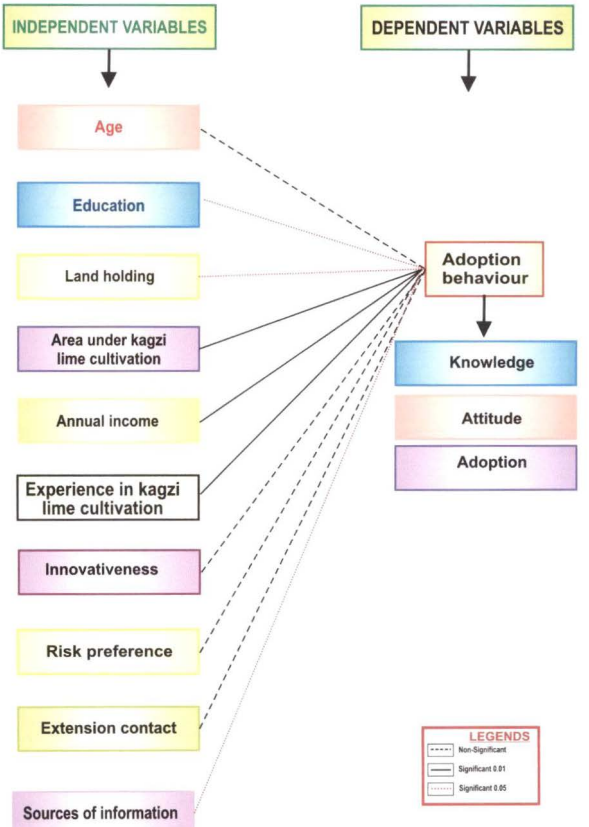

Fig. 17. Empirical research model

CHAPTER V

SUMMARY AND CONCLUSION

The present study "Adoption behaviour of Kagzi lime growers" was conducted in Akola, Murtizapur and Barshitakli Panchayat Samities of Akola district. The study was planned to investigate the adoption behaviour of Kagzi lime growers about Kagzi lime cultivation practices. It was also thought to be worthwhile to ascertain the constraints faced by the Kagzi lime growers, in adoption of recommended cultivation practices of Kagzi lime crop.

5.1 Objectives of the study

The present study was therefore undertaken with the following specific objectives.

1. To study the profile of Kagzi lime growers.
2. To study the adoption behaviour of Kagzi lime growers about recommended cultivation practices of Kagzi lime.
3. To study the relationship between selected characteristics of the farmers with their adoption behaviour about cultivation practices of Kagzi lime.
4. To study the constraints in adoption of the Kagzi lime cultivation practices.

5.2 Methodology

The exploratory research design of social research was used in the present investigation. The sample was drawn from Akola, Murtizapur and Barshitakli Panchayat Samities of Akola district of Maharashtra State. From this Panchayat Samities 12 villages were selected on the basis of area under Kagzi lime crop. Thus, 120 farmers constituted the sample for the study. Data were collected by personally interviewing the respondents with the help of pretested and structured interview schedule. The data collected were tabulated and the statistical tools namely mean, standard deviation, percentage, frequency and correlation coefficient were employed for interpretation of the findings. Null hypothesis set for the study was tested for its acceptance and rejection.

The characteristics of the respondents namely age, education, land holding, area under Kagzi lime cultivation, annual income, experience in Kagzi lime cultivation, innovativeness, risk preference, extension contact and sources of information were studied as an independent variables. Whereas the knowledge, attitude, adoption and adoption behaviour were studied as dependent variables.

5.3 Findings

The salient findings of the study have been summarized as under.

1. Maximum number (40.00%) of the respondents were included in the middle age group of 36 to 50 years.
2. More than one third (40.83%) of the respondents were educated up to high school followed by 13.34 per cent of the respondents who could reach college level of education.
3. Over one third of the respondents (44.17%) belonged to category of semi medium land holding ranging from 2.01 to 4.00 ha.
4. Most of the respondents (69.16%) had area under Kagzi lime cultivation in low category ranging up to 1.5 ha.
5. Relatively higher proportion of the respondents (48.33%) had annual income between 2,00,001 to 4,00,000.
6. Maximum respondents (60.00%) had experience of 7 to 9 years in Kagzi lime cultivation.
7. Majority of the respondents (62.50%) were included in the category of medium innovativeness.
8. More than the half of the respondents (71.66%) were found taking medium risk in Kagzi lime cultivation.
9. Over half of the respondents (68.34%) were having medium extension contact.
10. More than half of the respondents (65.00%) were having high sources of information.
11. About 72.50 per cent Kagzi lime growers had medium level of knowledge of recommended Kagzi lime cultivation practices.
12. More than half of the respondents (64.16%) were having favourable attitude towards Kagzi lime cultivation practices.

13. Over half of the respondents (59.17%) were having medium level of adoption of recommended Kagzi lime cultivation practices.
14. Most of the respondents (65.00%) had medium level of adoption behaviour about Kagzi lime cultivation practices.

5.4 Relational analysis

The findings of relational analysis of the selected characteristics of respondents with knowledge, attitude, adoption and adoption behaviour about recommended Kagzi lime cultivation practices have been summarized as under.

5.4.1 Knowledge

The findings of correlation analysis revealed that, the characteristics such as variables annual income and experience in kagzi lime cultivation practices were positively and highly significantly correlated with the knowledge regarding Kagzi lime cultivation practices. The variables land holding and sources of information was positively and significantly correlated with the knowledge towards cultivation practices of kagzi lime. The variables such as age, education, area under Kagzi lime cultivation, innovativeness, risk preference and extension contact were having non- significant relationship with knowledge towards recommended Kagzi lime cultivation practices.

5.4.2 Attitude

The findings of correlation analysis revealed that, the characteristics like education, area under kagzi lime and annual income were positively and significantly correlated with the attitude towards kagzi lime cultivation practices. The variable sources of information was positively and significantly correlated with the attitude toward kagzi lime cultivation practices. The variables such as age, land holding, experience in kagzi lime cultivation, innovativeness, risk preference and extension contact were having non-significant relationship with attitude towards recommended kagzi lime cultivation practices.

5.4.3 Adoption

Among the selected variables land holding, area under Kagzi lime cultivation and experience in kagzi lime cultivation practices were positively and highly significantly correlated with the adoption of recommended

cultivation practices of Kagzi lime. The variables namely annual income and sources of information were also positively and significantly correlated with the adoption of recommended cultivation practices of Kagzi lime. The variables namely age, education, innovativeness, risk preference and extension contact were having non-significant relationship with adoption towards Kagzi lime cultivation practices.

5.4.4 Adoption behaviour

Among the selected variables area under Kagzi lime cultivation, annual income and experience in Kagzi lime cultivation were positively and highly significantly correlated with the adoption behavior at 0.01 level of probability. The variables education, land holding and sources of information was positively and significantly correlated with adoption behavior at 0.05 level of probability. The variables age, innovativeness, risk preference and extension contact were having non-significant relationship with adoption behaviour of farmers towards cultivation practices of Kagzi lime.

5.4.5 Constraints

In the findings it has been revealed that 79.16 per cent of the respondents expressed lack of knowledge about use of different plant growth regulators, followed by jumbling while selecting pesticides and fungicides (75.55%), shortage of irrigation water during summer (70.83%), non-availability of money in time (70.83%), high cost of inorganic fertilizers and micronutrients (66.66%), lack of knowledge about fertilizer management (66.66%),lack of timely guidance(66.66%),low rates of Kagzi lime fruits(66.66%),fluctuation in market rates (66.66%),inadequate and timely availability of fertilizers (62.50%), lack of knowledge about plant protection measures (62.50%), no guarantee of payment received from merchants (62.50%), high cost of pesticides and fungicides (58.33%), lack of knowledge about recommended technology(58.33%), inadequate sources of finance (58.33%), problems in identification of diseases and pest (50.00%), high wages of labour (41.66%).

CHAPTER VI

IMPLICATIONS

The implication based on the findings of this investigation have been presented into two parts viz., action and implications. Implications with regards to research are based on experiences during the course of investigation and was useful for guidelines and suggestions for further research on same topic. Action implications may also be useful for extension personnel, policy makers and other related personnel, engaged in agricultural development.

6.1 Implication for action

1. The adoption behaviour of kagzi lime growers about improved cultivation practices were studied in terms of knowledge, attitude and adoption of kagzi lime growers. The findings in this regard revealed that majority of the kagzi lime growers (65.00%) were observed in medium level of adoption behavior. In case of knowledge large majority (72.50%)were in medium level followed by favorable attitude reported by 64.16 per cent and adoption of recommended practices of grape were observed in medium level by little less than three fourth (59.17%) of the respondents.
2. The main constraints in adoption of recommended practices of Kagzi lime were high cost of required inputs. In this regards it implicated that farmers should try the early available credit sources which may also be used for making capital availability when needed for Kagzi lime cultivation.
3. The findings of the study further revealed that, most of the respondents possessed medium level of knowledge about recommended cultivation practices of Kagzi lime. The inadequate knowledge mostly reflects on attitude, adoption and adoption behaviour of the farmer. In order to achieve a higher level of adoption behaviour of the Kagzi lime growers, they are required to be fully equipped with latest technical knowledge about cultivation of Kagzi lime crop. Therefore, the implication is that the extension agency may give suitable educational efforts by way of undertaking specialized training programmes, method and results

demonstrations and field visits, personnel of National Horticulture Mission, private consultancy, NGO's and department of agriculture should organize awareness programmes about importance of these practices to get more yield of kagzi lime.

4. The results of the present study indicated that majority of the respondents were found to possess favorable attitude towards Kagzi lime cultivation practices. So there is dire need to change the attitude of the respondents through guidance, persuasion, specialized training programmes, method and results demonstrations and field visits.
5. The extent of adoption of recommended cultivation practices for Kagzi lime crop revealed that most of the respondents had medium level of adoption. It thus implied that adoption of recommended cultivation practices of Kagzi lime was not to the fullest extent. The extension workers may therefore, convince the Kagzi lime growers by arranging demonstrations both method and results demonstrations, awareness programmes about importance of these practices to get more yield of kagzi lime and field visits to the demonstration plot.
6. The majority of the respondents were exhibited as medicore in respect of adoption behaviour of Kagzi lime cultivation practices. It indicates a scope for improvement of adoption behaviour of farmers about Kagzi lime cultivation practices through imparting knowledge and motivating the farmers through guidance, persuasion, specialized training programmes, method and results demonstrations and field visits.
7. The findings with regards to the marketing of Kagzi lime revealed that respondents did not get remunerative prices for their produce. This tends to imply that there is need to safeguard the interest of Kagzi lime growers and maximize their returns.

Hence, it may be suggested that collective transport should be facilitated by the informal groups for marketing of kagzi lime.

6.2 Implications for future research

The implication emerged from the present study suggest some measures for future research as follows,

1. The study was conducted in Akola, Murtizapur and Barshitakli Panchayat Samities of Akola district of Vidarbha region with restricted sample size. Therefore, generalization based on this study alone will not be meaningful. It is therefore, implicated that study may be extended to other similar areas of other Panchayat Samities of Akola district.
2. Multi-location studies may be conducted on adoption behaviour of Kagzi lime growers, for generalization of findings on a wide range.
3. This type of study can also be carried out in other horticultural crops where intensive cultivation practices are applicable. It will help to know the different levels of adoption behavior in different horticultural crops.
4. There is also a wide scope to study some more intrinsic and extrinsic factors that contributes to the adoption behavior of Kagzi lime growers.

CHAPTER VII

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Appendix
INTERVIEW SCHEDULES

DEPARTMENT OF EXTENSION EDUCATION, DR. PDKV, AKOLA

Title of Research : **Adoption Behaviour Of Kagzi Lime Growers**
Name of Researcher : **Miss Chavan Shubhangi Ramsingh**

A) General information

1. Name of Farmer :.....
Village : ..... Taluka .....
District: .....

Part-I Independent variables

2. Age : ..... Years

3. Education : ..... Std.

4. Land holding : a. Rainfed ..... ha
b. Irrigated area ..... ha
c. Total area ..... Ha

5. Area under Kagzi Lime cultivation:.....ha

6. Annual Income : a. Main occupation : ..... Rs.
b. Subsidiary occupation : ..... Rs.
c. Total : ..... Rs.

7. Experience in Kagzi lime cultivation:.....Years

8. Innovativeness

Sr. No.	Statements	Agree	Undecided	Disagree
1.	I feel restless till I try out a new farm practice I have heard about.			
2.	They talk of many new farm practices these days but who knows, if they are better than old practices.			
3.	After all, our forefathers were wise in their farming practices and did not see any reason for changing these old practices.			
4.	Often new farm practices are not successful, However if they are promising. I would surely like to adopt them.			
5.	From time to time I have heard of several new farm practices and I have tried most of these in last few years.			
6.	Somehow,I believe that the traditional ways are the best.			

9. Risk Preference

Sr. No.	Statements	Responses				
		SA	A	UD	DA	SD
1.	A farmer should grow large number of crops to avoid greater risk involved in growing one or two crops					
2.	A farmer should rather take more of chances in making a big profit than to content with a smaller but less risky profit					
3.	A farmer who is willing to take greater risk than the average farmers usually does better financially					
4.	It is good for a farmer to take risk when he knows his chance of success is fairly high					
5.	It is better for a farmer not to try new farming method unless most other farmers have used them with success					
6.	Trying an entirely new method in farming by farmer involves risk but it is worth living.					

SA- Strongly agree, A- Agree, UD– Undecided,
D- Disagree, SD – Strongly disagree,

10. Extension contact

Sr. No.	Extension contact	Frequency of contacts		
		Regular	Sometime	Never
	Formal			
A.	Zilla Parishad			
1.	Gram Sevak			
2.	Agril. Assistant			
3.	Extension Workers Of Panchayat Samiti			
4.	Taluka Agril. Officer			
5.	Agril. Development Officer			
6.	Block Development Officer			
B.	State Department			
1.	Extension Worker Of State			
2.	Department Of Agriculture			
C.	Agril. University			
1.	Scientist			
	Informal			
1	Friends			
2	Agril. input dealers			
3	Progressive farmers			
4.	Relatives			
5.	Neighbourers			

10. Source of Information

Sr. No.	Sources	Regular	Sometime	Never
A.	**Personal Sources**			
1	Neighbourers			
2	Friends			
3	Relatives			
4	Progressive Farmers			
5	Member Of Gram Panchayat			
6	Local Leader			
B.	**Impersonal Sources**			
1.	Gramsevak			
2.	Krishisevak			
3.	Agriculture Supervisor			
4.	Agriculture Officer			
5.	Agriculture Extension Worker			
6.	Agril. University/KVK Specialist			
7.	Group Discussion			
8.	Training			
9.	Demonstration			
10.	Tour			
11.	Participation In Agri-Exhibition			
C.	**Mass Media Sources**			
1.	Radio			
2.	Television			
3.	Newspaper			
4.	Agriculture Literature(Magazine)			
5.	Internet			
D.	**Trade Organizations**			
1.	Agriculture Produce Marketing Committee(APMC)			
2.	Authorised Dealer(Fertilizer, Insecticides,Seed)			
3.	Co-Operative Society			
4.	Other (Specify)			

Part –II Dependent variables

1. KNOWLEDGE

Sr. No.	Cultivation practices	Knowledge	
		Yes	No
A.	**Land preparation(ploughing,harrowing,etc)**		
1.	What type of soil is recommended for cultivation of kagzi lime? (light, friable loamy soils,free drainage,etc.)		
2.	Which practices are necessary for land preparation?		
B.	**Variety**		
1.	Which varieties of kagzi lime are recommended for		

	cultivation in this area? (Pramalini, Vikram, PDKV Lime etc.)		
2.	What are the characteristics of recommended variety of kagzi lime?		
3.	What is the source of planting material?		
C.	**Propagation**		
1.	Which propagation method generally used in this area? (seedling/budding)		
D.	**Spacing**		
1.	What is recommended spacing for kagzi lime? (6X6)		
2.	What should be the optimum population of kagzi lime crop for 1 ha area? (1200 to 1300 plants per hectare)		
E.	**Training**		
1.	Which type of training method is recommended in kagzi lime crop?		
F.	**Pruning**		
1.	Which is suitable time for pruning in kagzi lime crop?		
G.	**Bahar treatments**		
1.	Which are the different bahars of kagzi lime? (Hasta, Mrig and Ambia bahar.)		
H.	**Organic manure**		
1.	What is recommended dose of FYM per hectare for kagzi lime crop?		
I.	**Fertilizer application**		
1.	What is recommended dose of fertilizers(NPK) kg per hectare? (450+225+225 g NPK.)		
J.	**Irrigation**		
1.	What is the recommended method of irrigation for kagzi lime crop? (double ring method)		
K.	**Plant protection**		
1.	Which are the major pests of kagzi lime crop? (fruit sucking moth, citrus bark eating caterpillar,citrus black fly etc.)		
2.	Which are the insecticides recommended for control of these pests? (application of petrol swab, spray of acephate etc.)		
3.	Which are the major diseases of kagzi lime crop? (bacterial canker)		
4.	Which are the chemicals recommended for control of above diseases?		
L.	**Harvesting**		
1.	Which is the appropriate stage of harvesting of kagzi lime crop?		
M.	**Marketing**		
1.	Which types of fruits fetch more price in market? (large)		
N.	**Post harvest technology**		
1.	Which processed products are prepared from kagzi lime?		

CK=Complete Knowledge, NK=No Knowledge,
PK= Partial Knowledge

2. ATTITUDE

Sr. No.	STATEMENT	A	U	DA
1.	Kagzi lime cultivation is beneficial over other field crops			
2.	Kagzi lime cultivation is risky than the other crops			
3.	There are large limitations on the Kagzi lime cultivation			
4.	Kagzi lime cultivation required technical skill			
5.	One can get more profit if he/sheundertake take Kagzi lime cultivation			
6.	I don't consider Kagzi lime cultivation as creditable income generation			
7.	Kagzi lime cultivation is not possible to ordinary farmer			
8.	Kagzi lime cultivation required high initial cost			
9.	Kagzi lime growing has helped to the rural youths in increasing the employment status in rural area			

A= Agree **U= Undecided**
DA= Disagree

3. ADOPTION

Sr. No.	Cultivation practices	Adoption		
		CA	PA	NA
A.	**Land preparation**			
1.	Type of soil on which kagzi lime was grown?			
2.	Which is the major operation followed for land preparation?			
B.	**Variety**			
1.	Which variety was cultivated?			
C.	**Propagation**			
1.	Which propagation method have you followed for kagzi lime crop? (seedling, budding,etc.)			
D.	**Spacing**			
1.	Which spacing you followed in kagzi lime crop?			
2.	What was the optimum population of kagzi lime crop in your field?			
E.	**Training**			
1.	Which training method you followed in kagzi lime crop?			
F.	**Pruning**			
1.	What was the pruning time of kagzi lime crop?			
G.	**Bahar treatments**			
1.	Which bahar was undertaken by the farmers?			
H.	**Organic manure**			
1.	How much quantity of FYM was applied for kagzi lime			

	crop?			
I.	**Fertilizer application**			
1.	What was the quantity of NPK applied for kagzi lime crop?			
J.	**Irrigation**			
1.	Which irrigation method was used in kagzi lime crop?			
2.	Which critical growth stage was considered for irrigation of kagzi lime crop?			
K.	**Plant protection**			
1.	Which chemicals were used for control of pests in kagzi lime crop?			
2.	Which chemicals were used for control of diseases in kagzi lime crop?			
L.	**Harvesting**			
1.	Which period that you have followed for harvesting of kagzi lime crop?			
M.	**Marketing**			
1.	Which type of kagzi lime fruits that you selected for marketing?			
N.	**Post harvest technology**			
1.	Which products you have prepared from kagzi lime fruits?			

CA=Complete Adoption **PA=Partial Adoption**
NA=No Adoption

PART-III

Constraints in adoption of kagzi lime cultivation practices

Sr. No.	Constraints	Tick (√)
A.	**Cultivation constraints**	
1.	Inadequate and timely availability of fertilizers.	
2.	High cost of inorganic fertilizers and micronutrients.	
3.	Shortage of irrigation water during summer.	
4.	Problems in identification of diseases and pest.	
5.	High cost of pesticides and fungicides.	
6.	Jumbling while selecting pesticides and fungicides.	
7.	High wages of labour.	
B.	**Technical constraints**	
1.	Lack of knowledge about recommended technology.	
2.	Lack of knowledge about fertilizer management.	
3.	Lack of knowledge about plant protection measures.	
4.	Lack of knowledge about use of different plant growth regulators i.e.GA, leosin,CPPU,etc.	

VITA

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5. **Academic qualifications** :

Sr.No	Name of Degrees awarded	Year in which obtained	Division / Class	Name of awarding University	Subjects
i.	B.Sc. (Agri)	2011	First Class	Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola	Agriculture

6. **Research paper published** : Nil
7. **Field of Interest** : Extension Activities, Administration and Agricultural industries.

Place: Akola

Date: 10 / 05 / 2013

(Chavan S.R.)

Signature of Student