

**ADOPTION OF IMPROVED VARIETIES RELEASED BY MAHATMA
PHULE KRISHI VIDYAPEETH RAHURI**

by

Ms. Pate Poonam Vilas

(Reg. No. 14/204)



DEPARTMENT OF EXTENSION EDUCATION

**COLLEGE OF AGRICULTURE, PUNE
MAHATMA PHULE KRISHI VIDYAPEETH
RAHURI-413722, DIST-AHMEDNAGAR
MAHARASHTRA, INDIA
2018**

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A Thesis submitted to the
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MAHARASHTRA, INDIA.**

In partial fulfilment of the requirements for the degree

of

MASTER OF SCIENCE (AGRICULTURE)

in

AGRICULTURAL EXTENSION



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DEPARTMENT OF EXTENSION EDUCATION

**COLLEGE OF AGRICULTURE, PUNE
MAHATMA PHULE KRISHI VIDYAPEETH
RAHURI-413722, DIST-AHMEDNAGAR
MAHARASHTRA, INDIA**

2018

CANDIDATE'S DECLARATION

I hereby declare that this thesis or part
thereof has not been submitted
by me or other person to any
other University or Institute
for a Degree or
Diploma

Place: Pune

Date: / /

(Poonam V. Pate)

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Asstt. Professor of Agril. Extension
College of Agriculture, Pune
Maharashtra, India.

CERTIFICATE

This is to certify that the thesis entitled, **“ADOPTION OF IMPROVED VARIETIES RELEASED BY MAHATMA PHULE KRISHI VIDYAPETH RAHURI”** submitted to the Faculty of Agriculture, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar (Maharashtra) in partial fulfilment of the requirement for award of the degree of **MASTER OF SCIENCE (AGRICULTURE)** in **AGRICULTURAL EXTENSION**, embodies the result of a piece of bonafide research work carried out by **MS. PATE POONAM VILAS** under my guidance and supervision and that no part of the thesis has been submitted for any other degree or diploma.

The assistance and help received during the course of this investigation have beenduly acknowledged.

Place: Pune

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Date : / /

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CERTIFICATE

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Date : / /

Dr. P.N. Rasal

Associate Dean and Principal

College of Agriculture, Pune

Maharashtra, India.

CERTIFICATE

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Place : Pune

(P. N. Rasal)

Date : / /

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Place: Pune

Date: / / 2018

(Poonam V. Pate)

CONTENTS

Chapter No.	Title	Page No.
	CANDIDATES DECLARATION	III
	CERTIFICATE OF RESEARCH GUIDE	IV
	CERTIFICATE OF HEAD OF THE DEPARTMENT	V
	CERTIFICATE OF ASSOCIATE DEAN	VI
	ACKNOWLEDGEMENT	VII
	CONTENTS	VIII
	LIST OF TABLES	XI
	LIST OF FIGURES	XII
	LIST OF MAPS	XII
	LIST OF ABBREVIATIONS AND SYMBOLS	XIII
	ABSTRACT	XIV
1	INTRODUCTION	1
2	REVIEW OF LITERATURE	9
2.1	Profile of respondents	9
2.1.1	Age	9
2.1.2	Education	10
2.1.3	Size of landholding	10
2.1.4	Annual Income	11
2.1.5	Sources of Information	11
2.1.6	Social participation	12
2.1.7	Cosmopoliteness	13
2.1.8	Knowledge	13
2.2	Level of adoption of improved technology by the respondents	14
2.3	Constraints	15
3	MATERIAL AND METHODS	16
3.1	Locale Of Research Study	16
3.1.1	Geographical Location, Area, Population , Rainfall	16
3.1.2	Educational Facilities	18
3.1.3	Credit Facilities	18
3.1.4	Communication And Transport	19

3.2	Method Of Sampling	19
3.2.1	Selection Of Tehsils	19
3.2.2	Selection Of Villages And Respondents	19
3.3	Research Design	20
3.4	Tools Used In Data Collection	20
3.4.1	Designing Of Interview Schedule	20
3.4.2	Pre-Testing Of Interview Schedule	20
3.4.3	Collection Of Data	20
3.4.4	Compilation Of Data	20
3.5	Variables And Their Measurement	20
3.5.1	Mesaurement Of Independent Variables	21
3.5.1.1	Age	21
3.5.1.2	Education	21
3.5.1.3	Landholding	21
3.5.1.4	Annual Income	22
3.5.1.5	Sources of Information	22
3.5.1.6	Social Participation	22
3.5.1.7	Cosmopoliteness	23
3.5.1.8	Knowledge	23
3.5.2	Measurement of Dependent Variable	23
3.5.2.1	Adoption	23
3.5.3	Constraints	24
3.6	Statistical Tools Used for Analysis of Data	24
3.6.1	Frequency	24
3.6.2	Percentage	24
3.6.3	Mean	24
3.6.4	Standard Deviation	25
4	RESULTS AND DISCUSSION	26
4.1	Profile of Respondents	26
4.1.1	Age	26
4.1.2	Education	27
4.1.3	Landholding	28
4.1.4	Annual Income	29

4.1.5	Sources of information	31
4.1.6	Social participation	34
4.1.7	Cosmopoliteness	35
4.1.8	Knowledge	37
4.2	Adoption	39
4.3	Constraints	42
4.4	Suggesstions	44
5	SUMMARY, CONCLUSION AND IMPLICATIONS	46
6	LITERATURE CITED	49
7	APPENDICES	52
8	VITA	56

LIST OF TABLES

Table No.	Description	Page No.
1	Table showing crops, tehsils and selected villages	20
2	Distribution of respondents according to their age group	26
3	Distribution of respondents according to their level of education	27
4	Distribution of respondents according to the size of landholding	28
5	Distribution of respondents according to their annual income	29
6	Distribution of respondents according to sources of information used	31
7	Distribution of respondents according to types of sources of information used	32
8	Distribution of respondents according to social participation	34
9	Distribution of respondents according to particulars of social participation used by them	35
10	Distribution of respondents according to cosmopolitaness	35
11	Distribution of respondents according to their particulars of cosmopolitaness	37
12	Distribution of respondents according to knowledge of improved varieties	37
12.1	Crop wise knowledge of variety released by MPKV, Rahuri	38
13	Distribution of respondents according adoption of improved varieties	39
14	Crops and improved varieties which were adopted	40
15	Distribution of respondents according to level of adoption based on duration of adoption of varieties	40
16	Reasons for adoption of varieties of private seed producers (Non-adopters)	42
17	Distribution of respondents (non-adopters) according to constraints faced in adoption of improved varieties	43
17.1	Distribution of respondents (adopters) according to constraints faced adoption of improved varieties	44
18	Distribution of respondents according to suggestions made for adoption of improved varieties	45

LIST OF FIGURES

Figure No.	Description	Page No.
1	Distribution of respondents according to their age group	27
2	Distribution of respondents according to their level of education	28
3	Distribution of respondents according to the size of landholding	29
4	Distribution of respondents according to their annual income	31
5	Distribution of respondents according to sources of information used	33
6	Distribution of respondents according to social participation	34
7	Distribution of respondents according to cosmopolitaness	36
8	Distribution of respondents according to knowledge of improved varieties	38
9	Distribution of respondents according to adoption of improved varieties	39
10	Distribution of respondents according to level of adoption based on duaration of adoption of vareties	41

LIST OF MAPS

Map No.	Description	Page No.
1	Map of Pune district with selected tehsils and selected crops from tehsils	18

ABBREVIATIONS

%	:	Per cent
Agril.	:	Agricultural
et al.	:	And other
etc.	:	Et cetera
Fig.	:	Figure
ha.	:	Hectare
i.e.	:	That is
Kms	:	Kilometers
viz.	:	Namely (videlicent)

ABSTRACT

ADOPTION OF IMPROVED VARIETIES RELEASED BY MAHATMA PHULE KRISHI VIDYAPEETH RAHURI

by

Miss. Pate Poonam Vilas

A candidate for the degree

of

Master of Science (Agriculture)

in

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2018

Research Guide : Dr. Pallavi D. Suryawanshi

Seed is the most crucial, vital and basic input for attaining sustained growth in agricultural production and productivity. Improved seeds have a special place amongst all the inputs required for agricultural production. The use of input like irrigation, fertilizers and pesticides depends on rainfall situation, which is not in case with improved seeds. The farmers plan and commit themselves to purchase the improved seeds much in advance to the onset of season. The seed production and distribution planning is thus more important to the farmers.

Adoption of improved technology is affected by information about it reaching to the stakeholders, which is the first step in adoption process. The present study has been undertaken in the same context, in order to study the adoption of improved varieties developed by MPKV in past 10 years by the farmers of Pune district.

The study was conducted in Ambegaon, Baramati, Junnar, Khed, Maval, Purandar and Shirur tehsils of Pune for eight crops namely paddy, rabi sorghum, gram, green gram, soybean, groundnut, tomato and onion. There were total 200 respondents, one crop having 25 respondents each. An interview schedule was prepared based on objectives of study. The data was collected through personal interview.

It is observed from the data that more than half (67.50 %) of the respondents belonged to middle age group, more than one third (37.00 %) of the respondents completed their secondary level education, 37.50 per cent of the respondents had semi-medium (2.01-4.00 ha) size of landholding and 89.50 per cent had income up to Rs. 3,90,000.

It also revealed that more than half of the respondents had medium use of sources of information (52.50 %) and low score of social participation (55.00 %). Half (50.80 %) of the respondents had medium score of cosmopolitanism and 79.00 per cent of the respondents had knowledge of the improved varieties released by MPKV, Rahuri.

Out of all the respondents 50.50 per cent of respondents adopted the improved varieties and almost same number of respondents had medium and high level of adoption i.e. adopted the varieties for more than 2.1 years. Majority of the respondents (26.31 %) who had knowledge of the improved varieties of the university but did not adopt it, numbered 57 (28.50 % of 200) said that non-access to information of improved variety was reason for non-adoption.

Data reveals that, not getting information of improved varieties released by university was the major constraint in adopting those varieties as told by 42.42 per cent of non-adopters. Non-availability of seeds on time was another constraint as per 38.38 per cent respondents. Remarkably 30.30 per cent of respondents said that saved seeds were more reliable than other seeds. Not having technical knowledge of cultivation of particular variety, negative previous results of varieties of university, and negative feedback of other adopters of same variety were expressed as constraints in adoption of improved varieties by 5.05, 4.04 and 3.03 per cent non-adopter respondents respectively.

Adopters faced constraint in getting information of availability of seeds as told by 69.38 per cent of farmers. No facility for advance booking as constraint was told by 61.38 per cent of farmers. Also inadequate sales counters and limited quantity of seed was constraint in proper adoption for 55.44 per cent and 41.48 per cent of the farmers respectively.

Data reveals that 82.50 per cent of farmers suggested that information regarding availability of seed should be made available at village level. Respondents who said that seeds should be made available readily were 81 per cent. Respondents who said that know how about cultivating varieties should be known were 55 per cent. Respondents who said that follow up regarding variety of seeds should be taken were 45 per cent.

Based on the salient finding of the study it is implied that information dissemination regarding improved varieties should happen effectively up to village level, availability and accessibility of seeds should be increased, progressive farmers should be involved in seed production and information of improved variety and technical know-how of cultivation of variety should be given in advance.

1. INTRODUCTION

Seed is the most crucial, vital and basic input for attaining sustained growth in agricultural production and productivity. Improved seeds have a special place amongst all the inputs required for agricultural production. The use of input like irrigation, fertilizers and pesticides depends on rainfall situation which is not in case with improved seeds. The farmers plan and commit themselves to purchase the improved seeds much in advance to the onset of season. The seed production and distribution planning is thus more important to the farmers. Land fragmentation, monsoon vagaries and pest disease attack have been problems faced by Indian agriculture, impeding increase in yield and resulting in limitations to quality produce of crops. Improved varieties of agri-horticulture crops have long been the part of solution to above vagaries. The green revolution of 1960's gave impetus to the same and opened up new possibilities in the field of research for improved varieties. Improved varieties are developed by selection, such as pure line, mass selection, clonal selection etc., without hybridization.

Unlike traditional universities agriculture universities give equal importance to agriculture research and extension along with agriculture education. State agriculture universities having mandate of development of location specific crop varieties have been playing a major role in research and extension of improved varieties. Mahatma Phule Krushi Vidyapeeth, Rahuri (MPKV) since its establishment in 1968, has developed more than 237 improved and hybrid varieties of cereals, pulses, oilseeds, vegetables, sugarcane, fruits, flowers and cash crops giving improved yields as well as disease and pest resistance.

MPKV, Rahuri extends over Western Maharashtra comprising of 10 districts divided into four agro-climatic zone viz., Western Ghat Zone, Sub-mountain Zone, Plain zone and scarcity zone extended from Solapur to Nandurbar. In addition, Jalgaon district with assured rainfall which falls in central Plateau zone in the jurisdiction of the university.

Thrust Areas in Extension

- Effective implementation of novel and strategic extension projects viz., ICAR Farmer FIRST, RKVY Farmer FIRST.
- Human Resource Development Activities.
- Need based capacity development programmes for farmers and other stakeholders.
- Single window delivery system of technology products, diagnostic service and information through Agricultural Technology Information Centres.
- Development of gender-specific technologies.
- Creating awareness of improved agricultural technologies among the farmers.
- Development of quality publications.

- Use of ICT tools for effective technology application.
- Assessment refinement and demonstration of technology or products through KVKs.

For conducting the research on soil, climate, cropping system, livestock and other aspects of farming business, the university has network of research stations spread in different agro-climatic zones. In all 27 research stations are located in 4 agro-climatic zones. There are 18 sub-research stations where mainly verification of research work is being done to test the technologies developed by the university as well as take up the research programmes based on feedbacks received from the farmers.

Taking into consideration the availability of land, weather conditions and resources, the university has concentrated its efforts to develop suitable technologies for dry land agriculture, irrigated farming as well as for hi-tech agriculture. The university has focussed its attention on location specific and need based research activities in order to cater the needs of all types of farmers and farming groups.

Various agencies are involved in dissemination of information regarding improved technologies from the laboratory to the farmers. These include the formal extension systems of university and state government, Krishi Vigyan Kendras, Kisan Call Centre etc. MPKV has established Agriculture Technology Information Centre (ATIC), four Regional Extension Centres (REC), five District Extension Centres (DEC), Information Centres, Broadcasting Centres, Krishi Vigyan Kendras, Agriculture College Extension Blocks, Farmer-Scientist Forums etc., to bring the modern technology to the farmers. Details regarding these extension systems are given below.

Communication Centre

The communication centre of Mahatma Phule Krishi Vidyapeeth, Rahuri was established in May 1982 with the financial assistance of ICAR. However, after discontinuance of the financial assistance from the ICAR, it is being run with own resources of the university. The centre is established for effective use of mass media in transfer of technology. The unit produces different type of farm literature, publicity of news items, organization of exhibitions, organising broadcasting of Agril. Programmes for transfer of technology through All India Radio and Doordarshan and organising public relation media for communication of agricultural technology and guidance through correspondence.

The centre publishes *Krishi Darshani*, an annual farm diary which is very popular among the farmers. Besides Shri Sugi, a periodical is published before every season of the year. Also an e-news - MPKV Happenings, MPKV News Letter and MPKV *Varta* are published regularly. Besides DVDs of various crops are prepared by this centre.

Agricultural Technology Information Centre (ATIC)

The Agricultural Technology Information Centre (ATIC) is single window delivery dissemination and supporting system for various innovative and farm worthy techniques evolved at the university and affiliated organization in the pursuit of research and excellence.

This centre started its actual functioning w.e.f. 13th August, 2001 with the following objectives

- To empower farmers through direct access to information and knowledge.
- To create strong linkage between different research divisions, units and user of technology.
- To help farmers in problem solving and decision making.
- To facilitate and dynamic feed forward and feedback mechanism.
- To bridge the gap between attainable and attained in the crop, livestock development and production.
- To generate financial resources through sales and services.
- To disseminate the new technologies developed by the University through organizing Farmers Rallies, Field Visits and Agril. Exhibitions.

The ATIC is supervised by the Manager with four Subject Matter Specialists (SMS) from the disciplines viz., Agronomy, Horticulture, Plant protection and Animal husbandry & Dairy and Public Relation Officer (PRO). The extension activities like field visits, satisfying the queries of the farmers and other stakeholders and the centre performs diagnostic services in coordination with the other departments of University. Besides, the seed and seedlings, processed products and publications are also sold through ATIC to the end users. The sale counter for various agricultural inputs is also in operation for the farming community and other stakeholders.

Regional Extension Centres (REC)

Regional Extension Centres established in the year 2002 to test and transfer the improved technology from time to time in adjoining areas of respective research and educational institutes. Three RECs are started at the constituent colleges, viz., Pune, Dhule and Kolhapur and one at Central Campus, MPKV, Rahuri. Regional Extension Centre consists of four SMS in the subject of Agronomy, Animal Husbandary & Dairy Science, Horticulture and Plant protection. The activities of each REC are governed by Extension Agronomist at regional level, which is technically controlled by Director of Extension Education, which includes-

- To organize short duration training classes for up-gradation of knowledge of existing staff.
- To arrange farmers trainings for solving the problems in farming.

- To interact with farmers and officers for getting feedback on research findings.
- To organize monthly meetings of different allied departments and interact on various field problems.
- To integrate teaching, research and extension education activities.

The staff under the RECs usually undertakes activities relating to transfer of technology in the adjacent areas. The activities like, monthly district workshops, fortnightly trainings, demonstrations on farmers' fields, farmers' rallies and technical guidance to farmers are also organized by the centre.

Every Regional Extension Centre is provided a Mobile Crop Dispensary Van with the facilities to undertake soil and water analysis, diagnosis of diseases, insect, pest instantly on the spot in different villages. The fix route of this activity is announced and communicated well in advance to the farmers of respective villages and accordingly the farmers avail the guidance and necessary help to solve their problems.

District Extension Centres (DECs)

District Extension Centres established in the year 2002 to carry out extension education activities effectively and efficiently. Five District Extension Centres (DECs) have been started at different research stations viz. Jalgaon, Padegaon (Satara), Solapur, Kasbe Digraj (Sangli) and Niphad (Nashik). No separate staff is provided for DECs.

The important objectives of the DECs are-

- To organize short duration training programmes for up-gradation of knowledge.
- To arrange farmers trainings.
- To interact with farmers and officers for getting feedback.
- To coordinate with the line departments for implementing different extension programmes.

Farmers-Scientists Forum (FSF)

The University has evolved the concept of Farmers-Scientists Forum (FSF). The basic idea of formulating the Farmers-Scientists Forum is to demonstrate and to educate the farmers about the technology generated by the university at different locations. Besides, operational problems in adoption of these technologies have been identified and accordingly the technologies are refined, updated so that they are accepted and farmers are empowered with the technology.

Total 43 Farmers-Scientists Forums are established in the jurisdiction of the University and 1650 farmers have been registered as members (2016). The members of these FSF have received recognitions at state and national level. The member farmers have received the IARI

Best Farmer Awards, *Krishibhushan* awards by Government of Maharashtra and *Sahyadri Krishi Sanman Awards* by Doordarshan, Mumbai.

Extension Activities

1. Human Resource Development

Various training programmes are organized by the Directorate of Extension Education for the officers of Govt. agencies, officials of line departments, private company officials, farmers, farm women and youth on the topics viz., Diversified Agriculture, Integrated Nutrient Management, Improved Agro-techniques, Integrated Crop Production Technologies, Animal Husbandry and Dairy Sciences, Integrated Disease and Pest Management etc.

The University also organizes training programmes for the KVK SMSs on need based topics. Apart from this, various training programmes on agricultural mechanization, micro-irrigation, operation, repair and maintenance of harvesting and threshing machines are organized for the benefit of farmers. Similarly, the university is organizing several training programmes in collaboration with MANAGE, Hyderabad, EEI, Anand, NABARD, Pune etc.

The University is making efforts for generating self-employment opportunities for farmers, farm women and farm youth through capacity building programmes. For this purpose 16 Krishi Vigyan Kendras of university jurisdiction are engaged in organizing training programmes for self-employment on various aspects like organic farming, nursery management, seed production, vegetable cultivation, Hi-tech floriculture, poultry, drip and sprinkler irrigation, soil and water testing, vermicompost, turmeric processing, post-harvest technology, mushroom production technology, hygienic milk production and milk products etc.

2. Model Training Courses

Various Model Training Courses (MTC) were organized by the university in co-ordination with the Govt. of India. This includes MTC on Effective Communication for the enhancement and upliftment of rural people, Market intelligence and future trading, Market driven production and processing, Enhancing agriculture productivity through pressurized irrigation system and Mass multiplication of bio-pesticides and bio-agents. Extension functionaries are been trained through the MTC programmes. The MPKV is focusing on Skill India initiative through KVKs.

3. Action Plan Workshop for Krishi Vigyan Kendras (KVKs)

The University is providing technical backstopping to the KVKs through regular monitoring. The Action Plan Workshop of KVKs is regularly conducted by the University for the Programme Co-ordinators and Subject Matter Specialists. In this workshop the action plan of KVKs are finalized in consultation with university experts.

Retrospection Programmes

A programme on 'Retrospection' is regularly organized by the University for depicting the significant activities of the university related to education, research and extension education. On this occasion the university publication '*Krishi Darshani*' is released every year. This innovative programme has been started from 1992. During Retrospection an agricultural exhibition has been organized for showcasing the activities of our university for farmers and other stakeholders.

4. Video Conferencing facility

The University has established a Video Conferencing facility under the Agriculture Knowledge Management Unit (AKMU) at 11 locations. Under this facility apart from the educational purpose, it is being utilized for extension work. Interactions between university scientists and farmers at distant places are regularly organized. The university scientists also advise the farmers through mobile phones. Mechanisms for Research-Extension Linkages and Co-ordination with Development departments are as follows-

- i. The Research - Extension linkage between the University and various line departments is implemented through Joint Agresco, Zonal Agricultural Research and Extension Advisory Committee (ZAREAC), Memorandum of Understanding (MOUs), Monthly District Workshops, Training Programmes and Diagnostic Team Visits etc.
- ii. Farmers Rally: The Directorate of Extension Education organizes farmers rallies every year, in which large number farmers participate. Further, these farmers rallies are organized under university jurisdiction to disseminate the technology to farmers.

5. Front Line Demonstrations

The Directorate of Extension Education organizes Front Line Demonstrations through RECs, DECs and KVKs to disseminate the technology to farmers in kharif, rabi and summer season on farmers field.

6. Agricultural Exhibitions

The Directorate of Extension Education actively participates regularly in the organization of agricultural exhibitions at the National, State and District level. Similarly, this activity is undertaken during special events organized at the University.

Adoption of improved technology is affected by information about it reaching to the stakeholders, which is the first step in adoption process. The present study has been undertaken in the same context, in order to study the adoption of improved varieties developed by MPKV in past 10 years by the farmers of Pune district.

Categories of crops grown in Pune region were made comprising of cereals, pulses, oilseeds and vegetables. Under each of above categories two crops are selected on the basis of substantial area covered under the crop. The tehsils having maximum area under respective crop were selected. Tehsils selected include Junnar and Ambegaon in north, Maval in east, Shirur and Khed in west and Baramati and Purandar in southern part of district. The crops under consideration are paddy and rabi sorghum under cereals, gram and green gram under pulses, groundnut and soybean under oilseeds, and onion and tomato under vegetables.

Pune lies in the jurisdiction of MPKV, Rahuri. Owing to its varied climatic conditions several crops are grown here. A study of adoption of technology developed by the university would be useful in gauging the success of the extension methods as well as the usefulness of the technology in the district and help in strengthening the existing transfer of technology.

It is crucial to study the socio-economic background of farmers like age, education, annual income, social participation, cosmopolitaness etc. which plays a major role in adoption of any technology. Under the above considerations, the present study titled, “Study of Adoption of Improved Varieties released by MPKV, Rahuri” was conducted with the following objectives.

1.1 Objectives

1. To study the socio-economic profile of the farmers.
2. To study the extent of adoption of improved varieties released by MPKV, Rahuri.
3. To know the problems faced and suggestions made by farmers in adoption of improved varieties.

1.2 Hypothesis

It is hypothesized that adoption level of improved varieties released by MPKV, Rahuri is high in Pune district as it lies in jurisdiction of the university.

1.3 Importance and Scope of the Study

As mentioned earlier improved varieties are an excellent solution to low yield and pest-disease problem in agriculture. The study of their adoption is important from point of view of further research as well as effectiveness of current research.

The study focuses on the adoption of improved varieties released by Mahatma Phule Krushi Vidyapeeth, Rahuri of eight crops in seven tehsils of Pune.

Such type of study has not been carried out in the area before by any entity and thus will help in the programme of developing improved varieties as well as look into reasons which are responsible for non-adoption of improved varieties released by the university and also reasons for adoption of varieties released by private entities in certain cases.

1.4 Limitation of the Study

As the study was conducted by a student researcher, the investigation had constraints with respect to time and other resources. The findings of the study are based on the response of the selected respondents. Hence, the objectivity is limited to the extent of honesty and readiness of the respondents. However care has been taken to make the study as much systematic and objective as possible.

The area of study is restricted to Ambegaon, Baramati, Junnar, Khed, Maval, Purandar and Shirur tehsils of Pune district and eight crops. Therefore, the findings emerging out of the study cannot be generalized and applied to other tehsils of Pune or other districts under jurisdiction of Mahatma Phule Krishi Vidyapeeth, Rahuri.

2. REVIEW OF LITERATURE

An acquaintance with earlier pertinent studies was felt necessary to develop good understanding of the present study. A comprehensive and systematic review of the relevant literature is always a path finder to any research work.

Several research studies have been conducted on adoption of improved technology developed by universities. However, all attempts have been made to collect relevant research studies as per the objectives framed for the present study. The relevant literature on all respect of the investigation which is having direct and indirect bearing on the study has been organized and presented in this chapter.

2.1 Profile of respondents

2.2 Level of adoption of improved technology by respondents

2.3 Constraints faced by the respondents in adoption of improved technology

2.1 Profile of respondents

2.1.1 Age

Deshmukh *et al* (2007) observed that it was evident that majority of the respondents in adoption of improved technology, belonged to middle age group (47.22%) followed by young age group (34.72%) and old age group (18.06%).

Kumar *et al* (2013) observed that it was evident that majority of the respondents belonged to middle age group (42.22%) followed by old age group (41.11%) and young age group (16.66%).

Panda C. K. (2014) observed that in technology adoption 20 per cent farmers belonged to 25 to 35 years, 30 per cent belonged to group of 35-45 years, 18.34 per cent belonged to 45 to 55 years and 18.34 per cent belonged to above 55 years .

Jeelani *et al* (2014) observed that in adoption of improved animal husbandry practices majority of respondents (63.30%) were middle aged with mean age 44 years, followed by young (20.00%) having mean age of 37 years.

Kavad *et al* (2015) observed that more than half (65.00%) of the respondents were in the middle age group followed by young age (18.00%) and old age (17.00%).

Dhayal and Mehta (2015) observed that majority of farmers belonged to middle age group i.e. between 30-54 years of age. This age group constitutes 61.00 per cent of the total sample. Further farmers 21.00 per cent were from young and 18.00 per cent of old age group.

Patel *et al* (2015) majority (53.50%) of the respondents were in middle age group followed by 40.00 per cent of the respondents belonging to old age group and only 6.50 per cent were under young age group.

2.1.2 Education

Roy *et al* (2007) observed that educated farmers used to gather information from various sources, they kept contact with extension agencies and as their economic motivation was more their extent of adoption was high.

Kumar *et al* (2013) observed that large number of respondents were educated up to middle school (24.40%) followed by primary education (22.22%) and functional literates (20%) and illiterates are 15.5 per cent.

Panda C. K. (2014) noted that 40 per cent respondents had educational level upto 5th standard, 6.67 per cent were graduate or above and 12.50 per cent had education upto higher secondary level.

Kavad *et al* (2015) observed that slightly less than half (47.00%) of the respondents were found to have primary level education followed by secondary level (25.00%), illiterate (23.00%) and college and above educated (05.00%).

Soni *et al* (2015) observed that majority of farmers (47.00%) had an education upto primary school level followed by 32.00, 9.00 and 6.00 per cent had an education up to secondary level, higher secondary and graduation level respectively.

Mistry *et al* (2015) revealed that (38.00%) of respondents were illiterate, followed by primary education (30.00%), secondary education (18.00%) and higher secondary education (14.00 %).

Patel *et al* (2015) revealed that majority (36.00%) of the respondents were illiterate followed by 34.00, 19.00, 7.50 and 3.50 per cent were primary school level, secondary school level, Higher secondary level and college level education respectively.

2.1.3 Landholding

Meena *et al* (2012) observed that in adoption of rice production technology, 77.00 per cent of the total farmers were big, whereas 28.00 per cent farmers were small and rest 05.00 per cent of them were marginal farmers.

Kumar *et al* (2013) noted that in case of land holding majority of the farmers belonged to medium category (60%) followed by big (24.44%) and small farmers (15.55%).

Panda C. K. (2014) noted that among farmers adopting technology 56.67 per cent farmers had landholding within 0.5 ha, followed by 33.32 per cent within 0.5 to 1 ha, and least that is 3.33 per cent had within 2 to 3 ha.

Dhayal and Mehta (2015) observed that majority of farmers belonged to above 2 ha land holding group. This land holding category alone constitutes 64.00 per cent of the total sample. Further, 18.00 per cent were in small farmer category whereas, remaining i.e., 18.00 per cent farmers were in the marginal farmer's category.

Patel *et al* (2015) revealed that 42.00 per cent farmers possessed 2.01 to 4.00 ha of land followed by 37.00 per cent having 1.01 to 2.00 ha of land and 17.00 per cent having land up to 1.00 ha. While only 4.00 per cent having above 4.00 ha of land.

2.1.4 Annual income

Deshmukh *et al* (2007) revealed that in annual income category majority of the respondents (81.59%) fall under medium level of income having Rs. 10,001 to 87,000 annum, while 10.76 per cent respondents were of high level of income and remaining only 07.63 per cent were low level of income.

Meena *et al* (2012) revealed that majority of farmers belonged to middle income group i.e. between ₹ 1.50 to ₹ 5.75 lakh per annum. This income group alone constituted 72.50 per cent of the total sample. Further, 11.50 and 16.00 per cent farmers were from low and high income groups, respectively.

Kavad *et al* (2015) revealed that farmers having income up to Rs. 50,000 were 89.00 per cent, those having income between Rs 50,001 to 1,00,000 were 07.00 per cent, those with Rs. 1,00,001 to 1,50,000 were 02.00 per cent, those having income between Rs. 1,50,001 to 2,00,000 were 00.00 per cent and those having above Rs. 2,00,001 were 02.00 per cent.

Soni *et al* (2015) observed that 29.00 per cent farmers had annual income of Rs. 20,001 to 30,000 while 20.00, 19.00 and 12.00 per cent of them had up to Rs. 30,001 to 40,000 & upto 10,000, 10,001 to 20,000 and above Rs. 40,000 annual income respectively.

Mistry *et al* (2015) noted that majority (69.00 %) of the respondents fall under medium group of annual income followed by 21.00 per cent in high income group and 10.00 per cent in low income group

Patel *et al* (2015) noted that more than half (56.00%) of the farmers had annual income up to 10,001 to 20,000. While 26.00 per cent having less than 10,000 incomes. 12.00 per cent having the income between Rs. 20,000 to 30,000 while no one having income above Rs. 50,000.

2.1.5 Sources of information

Badal *et al* (2007) found that the greatest impact on adoption behaviour was that of source of information about new varieties. If farmers came to know about a new variety either through television or through research institutions, they believed it to be credible information and acted on it.

Singh *et al* (2011) observed that the seed shop was the major preferred source of knowledge in both the blocks Horticulture/Agriculture Officer and Extension personnel of State Agriculture University/ICAR Institute were the other major agents in providing knowledge to vegetable cultivators in the study area.

Mandal and De (2013) observed that in utilization of information sources majority (86.00%) had medium level of information sources utilized, followed by high utilization by (11.67%) and only (2.33%) had low level of utilization.

Jadhav *et al* (2014) observed that 48.34 per cent respondents had used medium sources of information, while (35.00%) and (16.66%) of them had used low and high sources of information respectively.

Ghadge and Patinge (2014) revealed that 64 per cent farmers had medium level of utilization of information source followed by 19 percent respondents had low level of utilization of information source and 17 percent respondents had high level of utilization of information sources.

Venkataramulu *et al* (2014) observed that more than half of the zero tillage farmers (56.67%) were reading agricultural magazine, whereas, only 15.80 per cent of conventional tillage farmers were reading agricultural magazine.

Kumar *et al* (2015) observed that in case of extension contact, it was observed that majority of respondents had low (61.11%) extension contact while 27.77 per cent had medium and 11.11 per cent had low extension contact.

2.1.6 Social participation

Jeelani *et al* (2014) observed that in adoption of improved animal husbandry practices majority (43.30%) had medium level of social participation, whereas (37.50%) had low level and (19.20%) had high level of social participation.

Kumar *et al* (2013) observed that majority of respondents had low (64.44%) level of social participation followed by medium (24.44%) and high level (11.11%) of social participation.

Jadhav *et al* (2014) revealed that more than half (53.34%) of the respondents had medium social participation, while 36.66 per cent and 10.00 per cent respondents had low and high social participation respectively.

Jakhar *et al* (2015) observed that it could be inferred that adoption was associated significantly with the social participation of marginal and small farmers. This might be due to the fact that the marginal farmers had more exposure by virtue of being member in different rural institution like gram panchayat, block panchayat, village cooperative society, kisan mandal etc. leading to their active participation in social activities.

Kavad *et al* (2015) observed that respondents with no membership of any organisation were 21.00 per cent followed by 48.00 per cent with membership in one organization and 31.00 per cent with membership in more than one organization.

Dhayal and Mehta (2015) observed 30 per cent farmers were not the member of any organization, 45.00 per cent were the member of one organization, and 25.00 per cent farmers had possessed the position of office bearer.

Patel *et al* (2015) observed that majority (82.50%) of the respondents did not participate in any social activity followed by 10.50 per cent in one activity and 05.50 per cent engaged in more than one activity.

2.1.7 Cosmopolitaness

Goswami *et al* (2010) observed that cosmopolitaness of fish farmers showed significantly positive relationship with adoption of scientific fish culture practices, implying there by that those farmers with higher contact beyond their own social system have more adoption.

Kumar *et al* (2011) observed that in adoption of dairy practices out of six variables, cosmopolitaness and education emerged as potential predictors because the *t*-value was found to be statistically significant in both cases. The study in question brought to the sharp focus that variable cosmopolitans and education played the dominant role in affecting the level of adoption of dairy farmers.

Lawrence and Ganguli (2012) observed that more than half of the respondents had medium level of cosmopolitaness whereas nearly one-third (27.00%) had low level of cosmopolitaness and the rest (21 %) had high level of cosmopolitaness.

Patel *et al* (2014) observed that medium level of cosmopolitaness was possessed by (60.00%) of dairy farmers. While one fourth (25.00 %) of them possessed low and 15 per cent possessed high level of cosmopolitaness

Hanglem *et al* (2015) observed that 67.50 per cent of respondents had medium level of cosmopolitaness, followed by 25.00 per cent with low level and 07.50 per cent with high level of cosmopolitaness.

2.1.8 Knowledge

Roy *et al* (2007) observed that in knowledge level about recommended practices gladiolus, majority (78.75%) of the respondents belonged to medium knowledge level category. 12.50 per cent of respondents belonged to high knowledge level and 08.75 per cent of the respondents belonged to low knowledge level category.

Sarada and Kumar (2013) noted that almost sixty (57.50%) of cotton farmers had medium level of knowledge followed by 31.67 per cent with low and only 10.83 per cent with high knowledge levels.

Shirke *et al* (2014) revealed that less than two- third (65.71%) of the mango growers had ‘medium’ level of knowledge regarding plant protection measures, while less than one-fifth

(19.05%) of them had 'low' level of knowledge. Only 15.24 per cent of the mango growers had 'high' level of knowledge.

Prasad *et al* (2015) revealed that in knowledge level of farmers regarding improved rice cultivation technology, majority of farmers i.e. 60.48 per cent had medium level of knowledge followed by low and high knowledge level category with 20.00 and 19.50 per cent, respectively.

Kavad *et al* (2015) noted that more than half (70.00%) of the respondents had medium level of knowledge regarding scientific cultivation of Nagli followed by 16.00 per cent and 14.00 per cent of the respondents had high level and low level of knowledge, respectively.

Chaudhari *et al* (2015) observed that great majority of beneficiary (93.33%) of farmers had medium to high and non-beneficiary (95.00%) of farmers had low to medium level of knowledge about improved agricultural technologies of wheat crop.

2.2 Level of adoption of improved technology by respondents

2.2.1 Adoption

Deshmukh *et al* (2007) observed that in adoption of improved practices it was clearly revealed that most of the respondents i.e. 81.94 per cent were falling under low adoption level, while remaining respondents i.e. 09.38 and 08.68 per cent were high and medium adoption level, respectively.

Dudi and Meena (2012) observed that in overall adoption it was evident that majority (50.00%) of trained farmers were having medium level of adoption of improved cultivation technologies and 31.67 per cent and 18.33 per cent were found in high and low category, respectively.

Nirmala and Vasantha (2013) noted that majority of the farmers (50.83%) had low level of adoption followed by medium (40.00%) and high (9.17%) level of adoption.

Sarada and Kumar (2013) noted that, almost 61.00 per cent of the farmers had medium adoption followed by one third (34.17%) with low adoption. Only 05.00 per cent of the farmers had high level of adoption.

Shirke *et al* (2014) observed that about majority (66.67%) of the mango growers had 'medium' level of adoption regarding plant protection measures, while 21.90 per cent and 11.43 per cent of them had 'low' and 'high' level of adoption respectively.

Ghadge (2014) observed that in adoption of improved production technology of mandarin majority farmers 62.00 per cent were medium adopters, while 18.00 per cent were low adopters and 20.00 per cent were high adopters.

Kavad *et al* (2015) observed that majority (81.00%) of the respondents had medium level of adoption followed by 10.00 per cent and 09.00 per cent had high level and low level of adoption, respectively.

Patel *et al* (2015) observed that majority (52.50%) of the tribal farmers had high level of overall adoption followed by 36.67 per cent, 10.00 per cent and 0.83 per cent had medium, very high and low level of overall adoption respectively.

2.3 Constraints

Deshmukh *et al* (2007) reveals the constraints of no information about variety released and agricultural technologies recommended by MAU were expressed by 62.5 per cent, while 56.94 per cent respondents gave other constraints like costly seed, lack of information regarding seed cost, place of sale and proper guidance. As much as 52.77 per cent respondents expressed that non availability of seed, travelling over long distance for seed purchase, but due to shortage of seed, seed is not available in due time.

Sarada and Kumar (2013) revealed that lack of knowledge on in-crop refuge area in Bt. cotton (100.00%) as an insect resistance management strategy which delays the development of resistance to Bt. gene by boll worms, lack of knowledge on correct doses of fertilizers and pesticides (79.16%), over exploitation of pesticide dealers by recommending unnecessary pesticides leading to increased cost of cultivation (74.16%), lack of knowledge about pest and disease identification (72.50%), lack of knowledge about IPM practices were the personal constraints faced by a majority of farmers in cotton production.

P. Ganesh Kumar *et al* (2013) revealed that 53.33 per cent farmers felt, lack of soil testing facilities at their nearest and lack of follow up action about the technologies were considered as constraints by 30 per cent of respondents. 20 per cent considered non availability of bio pesticides and fungicides was another constraint in adoption of IPM technologies.

Godawat and Bhati (2014) indicate that more than half of the respondents were of the view that high post-harvest losses, high initial cost of orchard establishment, high cost of transportation including fruits and planting materials and labour intensive affair were the economic problems in guava cultivation. High costs of planting materials, insecticides & pesticides and lack of credit facility were the other constraints perceived by 25-28 per cent guava growers.

3. MATERIAL AND METHODS

Materials and methods deals with research methods and techniques used as empirical measures for testing of hypothesis developed earlier. Detailed methodology was developed for studying various aspects.

This chapter deals with the discussion of procedure followed for carrying out the present study. It contains information regarding plan of study, tools and techniques employed for collection of data in the light of objectives of the study and null hypothesis. Moreover, the selections of proper sampling technique for investigation as well as devices for analysis of data have been discussed in this chapter. This chapter contains information on the following aspects.

3.1 Locale of study

3.2 Method of sampling

3.3 Research design

3.4 Tools used in the data collection

3.5 Variables selected and their measurement

3.6 Statistical methods used

3.1 Locale of the research study

Pune district of Maharashtra was purposively selected for the study considering the jurisdiction of Mahatma Phule Krushi Vidyapeeth, Rahuri and variety of crops cultivated in the district. Tehsils in Pune district which were selected are, Ambegaon, Baramati, Junnar, Khed, Maval, Purandar and Shirur.

3.1.1 Geographical location and features of tehsils

Junnar: Crops cultivated in the region include paddy, maize, pigeon pea, tomato, soybean, wheat etc. the tehsil is also popular for its grapes and other fruit crops like banana, sapota and recently pomegranate. It is endowed with more than five big and small dams and thus rich in irrigation facilities. Average rainfall is 800-900 mm and soil type is slightly deep, well drained, fine calcareous on gentle eastern slopes, shallow well drained clayey in majority portions of the tehsil. Area of tehsil is 1,38,332 ha with population of 2,35,972. Largest area under soybean is in Junnar i.e. 7,028 ha which is 63.60 per cent of total area (11,050 ha) under crop in Pune.

Ambegaon: Climatic conditions in the tehsil are similar to Junnar. Crops cultivated include paddy, pearl millet, gram, tomato and other vegetables. It receives irrigation from Dhimbhe dam as well as rivers like Ghod and Bhima. Average rainfall is 900-1000 mm and soil is deep, moderately well drained, strongly calcareous fine. Tehsil has area of 1,03,937 ha with a population of 2,35,972. Tomato is largest grown crop in tehsil, covering area of 3,800 ha, which is 42.45 per cent of total area (8,951 ha) under crop in Pune. Largest area under gram is also in Ambegaon i.e. 5,890 ha which is 20.00 per cent of total area (28,785 ha) under crop in district.

Khed: The tehsil is irrigated by the Chas-Kaman dam and Bhama- Aaskhed dam. Crops grown in the region include paddy, groundnut, sorghum, wheat, potato and onions. Average rainfall is 750-1,250 mm and soil is red laterite on hill slopes to medium black and deep black soils in plains. Tehsil has area of 1,03,937 ha with a population of 2,35,972. Largest area under groundnut is in Khed i.e 4,710 ha which is 30.74 per cent of total area (15,321 ha) under crop in Pune.

Maval: It is located in the western part of district. It has presence of rivers like Indrayani, Kundali and dams like Vadiwale for irrigation. Paddy is a dominant crop of the tehsil followed by sugarcane. Average rainfall is 2000 mm and soil is shallow, well drained clayey. Tehsil has area of 1,12,980 ha with a population of 3,77,559. Paddy is largest grown crop in tehsil, covering area of 10,553 ha, which is 19.00 per cent of total area (55,531 ha) under crop in Pune.

Shirur: It is a rain fed area of the district with 8 months of irrigation facility from dams like Bhama-Aaskhed and Chas-Kaman. Rain fed crops like pulses, rabi sorghum, pearl millet etc. dominate in the region. Average rainfall is 400-500 mm and soil is slightly deep, well drained clayey, calcareous. Tehsil has area of 1,56,026 ha with a population of 3, 85,414. Largest area under green gram is in Shirur i.e. 3,484 ha which is 78.55 per cent of total area (4,484 ha) under crop in Pune.

Baramati: Majority of area of the tehsil is dry and thus dominated by crops like sorghum, wheat, gram, onions and dryland horticulture. It receives water from the Niradevghar and Vir dams located in adjoining tehsils. Soil type is slightly deep well drained clayey, calcareous fine. Tehsil has area of 1,37,268 ha with a population of 4,29,600. Rabi sorghum is largest grown crop in tehsil, covering area of 38,000 ha, which is 27.09 per cent of total area (1,40,240 ha) under crop in Pune.

Purandar: The tehsil is located in dry region of the district and crops cultivated include sorghum, onion, pearl millet etc. It has performed spectacularly in dryland horticulture and leads in the production of fruit crops like custard apple, fig and pomegranate. It too receives irrigation from Vir and also Nazare dam. Soil type is slightly deep, well drained clayey, calcareous fine soils. Tehsil has area of 1,10,165 ha with a population of 2,35,659. Onion is largest grown crop

in tehsil, covering area of 1,062 ha, which is 39.31 per cent of total area (2,714 ha) under crop in Pune.



Map 1: Map of Pune district with selected tehsils and selected crops from tehsils

3.1.2 Educational facilities

Educational facilities are available up to secondary, higher secondary and graduation levels in all tehsils.

3.1.3 Credit facilities

The credit needs are well satisfied through the branches of different commercial and nationalized banks. The well organized and dense networks of banks help in fulfilment of credit need. Credit facilities are also available through Pune District Central Co-operative Bank.

3.1.6 Communication and transport

Communication facilities are available for easy and proper communication. Well established mobile network in all tehsils. Roads are in good condition.

3.2 Method of sampling

3.2.1 Selection of tehsils

The study was carried out in Ambegaon, Baramati, Junnar, Khed, Maval, Purandar and Shirur tehsils of Pune district. These seven tehsils were purposively selected according to majority of area under gram and tomato, rabi sorghum, soybean, paddy, onion and green gram respectively. Growing area under crops were obtained from District Agriculture Office.

3.2.2 Selection of villages and respondents

Information of villages from each tehsil having largest area under respective crops was obtained from Agriculture Officers of respective tehsil. Further, the necessary details about the selected villages were taken and farmers were interviewed. Twenty-five farmers for each were randomly selected crop and interviewed.

As shown below list of farmers was obtained from respective Agriculture Assistants, Krishi mitras and progressive farmers of 19 villages.

Table 1: Table showing crops, tehsils and selected villages.

Crop	Tehsil	Village
Paddy	Maval	Malwadi Koteswarwadi
Rabi sorghum	Baramati	Supa Borkarwadi Kutwalwadi
Gram	Ambegaon	Landewadi Shewalewadi Ganeshwadi Mhalunge-Padwal
Green gram	Shirur	Pabal Thapewadi
Soybean	Junnar	Shiroli
Groundnut	Khed	Holewadi Bhose
Tomato	Ambegaon	Ranjani Jadhavwadi Mhalunge-Padwal
Onion	Purandar	Khalad Walunj Nira (Shivtakrar)

3.3 Research design

Ex-post-facto approach was followed for the research study.

3.4 Tools used in the Data Collection

3.4.1 Designing of interview schedule

An interview schedule, based on the selected objectives of the study was prepared in local language (Marathi) in order to get accurate responses from farmers.

While preparing the interview schedule, due care was taken to avoid confusing questions, contradictory statements. The language of the questions was kept simple for easy understanding of the respondents.

3.4.2 Pre-testing of interview schedule

Before finalizing the interview schedule, it was pre-tested outside the sample area for the reliability and validity of the questions by interviewing ten respondents. The interview schedule was modified in the light of the practical experience of pre-testing and it was finally used for data collection.

3.4.3 Collection of data

The research worker personally interviewed the farmers included in the sample. The importance and objective of the study were clearly explained to all the respondents before interview. The respondents were getting interviewed during their leisure time, generally in the morning before they proceed for their work on farm, in the afternoon and in the evening hours when they returned home.

3.4.4 Compilation of data

The information collected through interview was transferred from the questionnaire to primary tables and then to secondary tables. Whenever necessary, the information of qualitative nature was converted into quantitative form. In this way the collected information was tabulated and analysed.

3.5 Variables and their Measurement

For the present study, two sets of variables namely, independent and dependent variables were selected. The methods and techniques used for measuring the independent and dependent variables are given below.

3.5.1 Measurement of Independent variables

3.5.1.1 Age

Considering chronological age completed at the time of interview the farmers were classified into following three groups-

Sr. No.	Category	Age
1.	Young	Up to 35 years
2.	Middle	36 to 55 years
3.	Old	56 years and above

3.5.1.2 Education

The term education referred to the formal education possessed by the respondent from primary to degree level at the time of interview. According to level of former education, the respondents were grouped into following categories-

Sr. No.	Category	Education
1.	Illiterate	No education
2.	Primary	I to VII Std.
3.	Secondary	VIII to X Std.
4.	Higher Secondary	XI to XII Std.
5.	College level education	Graduation
		Post-Graduation

3.5.1.3 Land holding

On the basis of total land possessed by the farmers for cultivation and standard land norms of Government of Maharashtra they were classified in to following categories-

Sr. No.	Land holding	Area
1	Marginal	Up to 1.00 ha
2	Small	1.01 to 2.00 ha
3	Semi-Medium	2.01 to 4.00 ha
4	Medium	4.01 to 10 ha
5	Large	10.01 ha and above

3.5.1.4 Annual income

Annual gross income of farmers from different sources during preceding year was worked out. On the basis of annual income, farmers were grouped into following categories using range method.

Sr. No.	Annual income (Rs.)
1.	Up to Rs. 3,96,000/-
2.	Rs. 3,96,000/- to 7,92,000/-
3.	Rs. 7,92,001/- to 11,88,000/-
4.	Rs. 11,88,001/- to 15,84,000/-
5.	Rs. 15,84,001/- and above

3.5.1.5 Sources of information

It refers to the use of sources of agricultural information and for knowledge of improved variety by the respondent farmers. The farmers were asked to record the consulting pattern used by them and their response was recorded in yes or no form. The numerical score 1 and 0 respectively were assigned to yes or no reply. Thus, total score was worked out and on the basis of mean $\pm$ SD they were classified into following categories. The mean was 8 with SD of 2.

Sr. No.	Category	Source of information (score)
1.	Low	up to 6
2.	Medium	7 to 10
3.	High	11 and above

3.5.1.6 Social participation

Social participation of farmers was worked out by considering their membership in one or more social organizations. Social participation score of the respondents was obtained by accessing one score for membership, two for office bearer and zero for no membership. The total score was obtained for each respondent for each organization they had participated in and on the basis of mean $\pm$ SD they were classified in to following categories. The mean was 1.93 with SD of 0.91.

Sr. No.	Category	Social participation (score)
1.	Low	Up to 1
2.	Medium	2 to 3
3.	High	4 and above

3.5.1.7 Cosmopoliteness

Cosmopoliteness of the farmers was tested by knowing their exposure to various knowledgeable sources outside their village. One score was given to farmer who visited any organization, additional 1, 2 and 3 score was given to the frequency of visits of each of these places. On the basis of mean $\pm$ SD farmers were classified into three groups. The mean was 4 with SD of 0.66.

Sr. No.	Category	Cosmopoliteness score
1	Low	Up to 4
2	Medium	4 to 5
3	High	6 and above

3.5.1.8 Knowledge

Knowledge of farmers regarding improved varieties released by MPKV, Rahuri was tested. One score was given if they knew about the varieties of crop under consideration and zero if they were unaware of the same. By calculating the total score, percentage of farmers with knowledge and without knowledge of varieties was obtained.

3.5.2 Measurement of dependent variables

3.5.2.1 Adoption

Adoption of improved varieties released by MPKV, Rahuri was tested by asking farmers if they cultivated the varieties for selected crops. One score was given for adoption and Zero for non-adoption. Simultaneously extent of adoption was tested by knowing duration of adoption. Level of adoption was calculated based on the following categories. Mean was 2.6 and SD 0.54.

Sr. No.	Level of adoption (score)	Years of adoption
1	Low	Up to 2 years
2	Medium	2.1 to 3
3	High	3.1 years and above

3.5.3 Constraints

It is a reason, cause which compels the farmers in non-adoption of improved varieties released by MPKV, Rahuri. The constraints experienced by the farmers were assessed by asking questions with yes and no as answers. Farmers reply about this aspect was recorded and respective percentage was worked out in order to draw conclusion. One score was given to yes as an answer and zero to no as an answer.

3.6 Statistical tools used for analysis of data

In this study the statistical methods, such as frequency, mean, standard deviation have been used.

3.6.1 Frequency

Frequency is the number of items repeated in the selected variables.

3.6.2 Percentage

Percentage was used in descriptive analysis for making simple comparison.

3.6.3 Mean

Mean was calculated by using the formula.

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

Where,

$\bar{X}$ = Mean

$\sum X$ = Sum of respondents score

N = Number of respondents

3.6.4 Standard deviation

It is positive square root of mean of the squared deviation taken from the arithmetic mean.

$$SD = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$$

Where,

SD = Standard deviation

$\bar{X}$ = Mean

X = Score of each respondent

N = Number of respondent

4. RESULTS AND DISCUSSION

This chapter deals with the presentation, analysis and interpretation of data. The data collected from 200 farmers from 19 villages from seven tehsils of Pune district were compiled through the primary and secondary table in view of objectives of study.

Subsequently, they were subjected to statistical treatment. Simple per cent and frequencies were worked out for descriptive analysis. The data presented tabular form with graphs as under the following heads, subheads and discussed as under.

The result of the research study are presented and discussed in the following headings and sequence.

4.1 Profile of the farmers.

4.2 Adoption level of improved varieties released by MPKV, Rahuri, by farmers.

4.3 Constraints faced by farmers in adoption of improved varieties.

4.4 Suggestions of farmers to overcome the constraints.

4.1 Profile of farmers

4.1.1 Age

The data about chronological age of the respondents were collected, compiled and presented in table 2.

Table 2: Distribution of farmers according to their age group

Sr. No.	Age (Years)	Respondents (n=200)	
		Number	Per cent
1	Young (Up to 35 Years)	22	11.00
2	Middle (36 to 55 Years)	135	67.50
3	Old (56 and above)	43	21.50
	Total	200	100.00

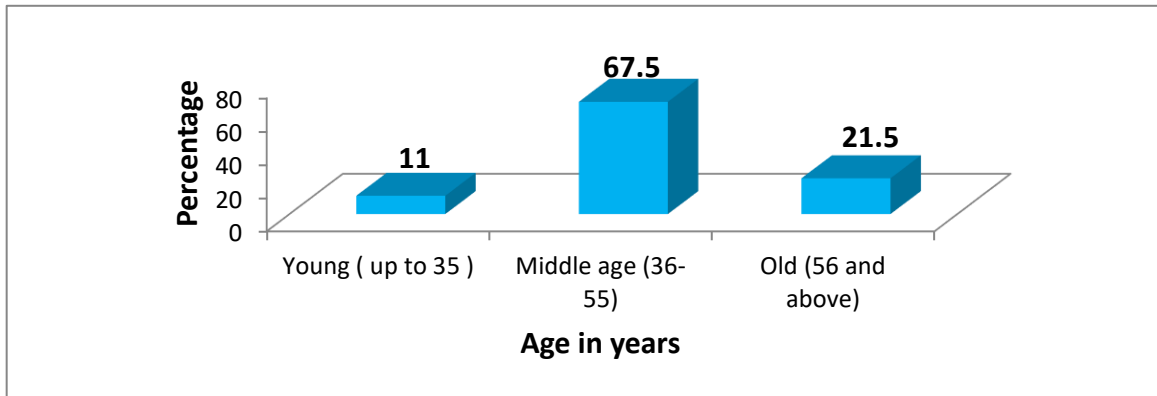


Fig. 1: Distribution of respondents according to age

An overview of Table 2 and figure 1 revealed that 11.00 per cent of respondents were in the young age group and 67.50 per cent of them were from middle age group. The remaining respondents were from old age group which are 21.50 per cent. The Table 2 also states that the maximum number of respondents were from middle age groups. The above findings are similar to that of Patel *et al* (2015).

4.1.2 Education

The level of formal education attained by an individual tends to influence the extent to which the person adopts the improved technology. Emphasizing this, information on education attained were collected and analyzed. The findings are presented in Table 3.

Table 3: Distribution of respondents by their level of education

Sr. No.	Education level	Respondents (n=200)	
		Number	Per cent
1	Illiterate	05	2.50
2	Primary level (1 st to 7 th std.)	36	18.00
3	Secondary level (8 th to 10 th)	74	37.00
4	Higher secondary (11 th and 12 th)	47	23.50
5	Graduation	35	17.50
6	Post-graduation	03	1.50
	Total	200	100.00

It is observed from the Table 3 and figure 2 that maximum number of respondents was educated. Among the educated persons majority of respondents (37.00%) had secondary school

level education. The respondents who had completed their higher secondary level education were 23.50 per cent. The primary level education was completed by 18.00 per cent, graduation by 17.50 per cent of the respondents, 2.50 per cent of the respondents did not receive any formal education whereas, 1.50 per cent had completed their post-graduation. Above findings are in conformity with the findings of Kumar *et al* (2013).

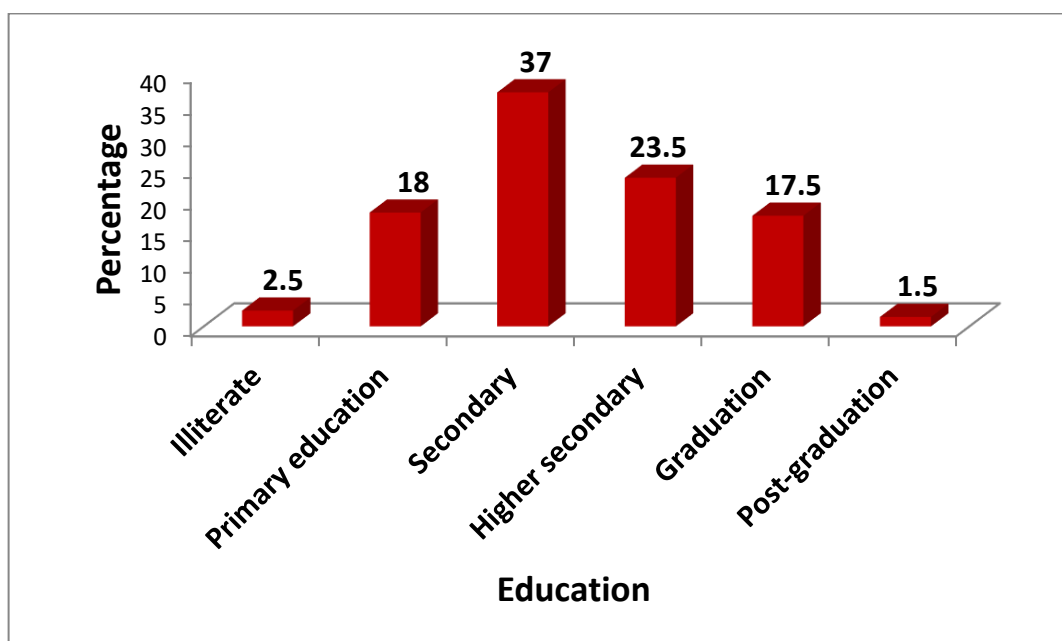


Figure 2: Distribution of respondents according to education

4.1.3 Size of land holding

Distribution of the respondents into five categories according to total land possessed by them is given in Table 4.

Table 4: Distribution of the respondents according to their total land holding

Sr. No.	Size of Land Holding	Respondents (n=200)	
		Number	Per cent
1	Marginal (Up to 1 ha)	49	24.50
2	Small (1.01 to 2.00 ha)	57	28.50
3	Semi Medium (2.01 to 4.00 ha)	75	37.50
4	Medium (4.01 to 10 ha)	18	9.00
5	Large (10 ha and above)	01	0.50
	Total	200	100.00

It was observed from the data given in Table 4 and figure 3 that 37.50 per cent of the respondents had semi medium size of land holding, 28.50 per cent of them had small size of land holding followed by 24.50 per cent of the respondents who had marginal size of land holding, 9 per cent of them had medium size of land holding, whereas only one of them had large size of land holding. The findings are in conformity with that of Patel *et al* (2015). It can be concluded that substantial proportion of the respondents had medium and small size of land holding, possible reason might be that the ancestor land was fragmented into smaller sized land holding.

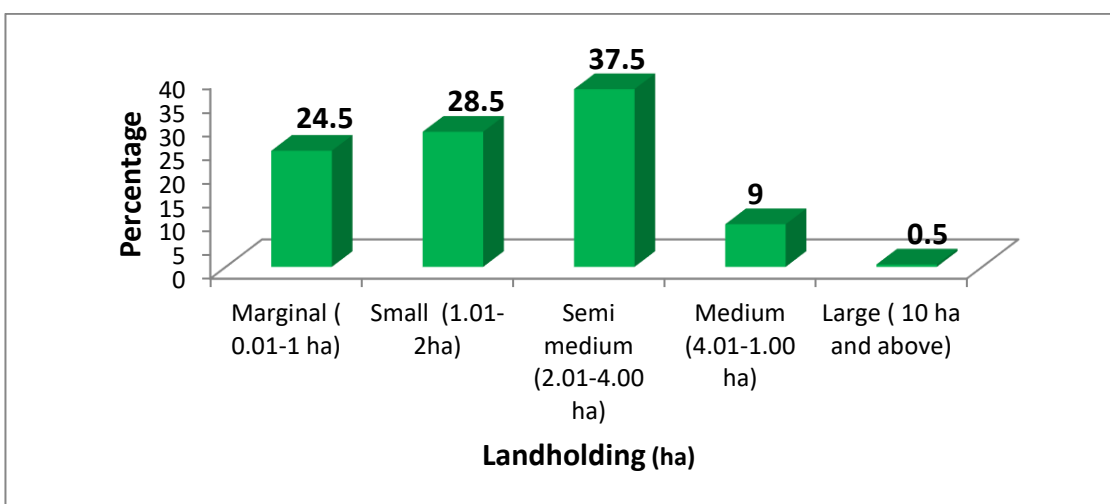


Figure 3: Distribution of respondents according to size of landholding

4.1.4 Annual Income

The data regarding total annual income of the respondents were obtained. According to annual income they were grouped into five categories as given in Table 5.

Table 5: Distribution of respondents according to their annual income

Sr. No.	Annual income (Rs.)	Respondents (n=200)	
		Number	Per cent
1	Up to Rs. 3,96,000/-	179	89.50
2	Rs. 3,96,001/- to 7,92,000/-	15	7.50
3	Rs. 7,92,001/- to 11,88,000/-	03	1.50
4	Rs. 11,88,001/- to 15,84,000/-	02	1.00
5.	Rs. 15,84,001/- and above	01	0.50
	Total	200	100.00

From the data mentioned in Table 5 and figure 4, it can be concluded that majority (89.50%) of the respondents had annual income up to Rs. 3,96,000/- and 7.50 per cent of them had annual income between Rs.3,96,001/- to 7, 92,000/-. While only 01.50 and 1.00 per cent of them had annual income between Rs.7,92,001/- to 11,88,000/- and 11,88,001/- to 15,84,000/- respectively. It was observed that only 0.5 per cent of the respondents (only one) had income above 15,84,001. These results may be due to possession of medium and small sized of land holding and cultivation of this land was only source of their income.

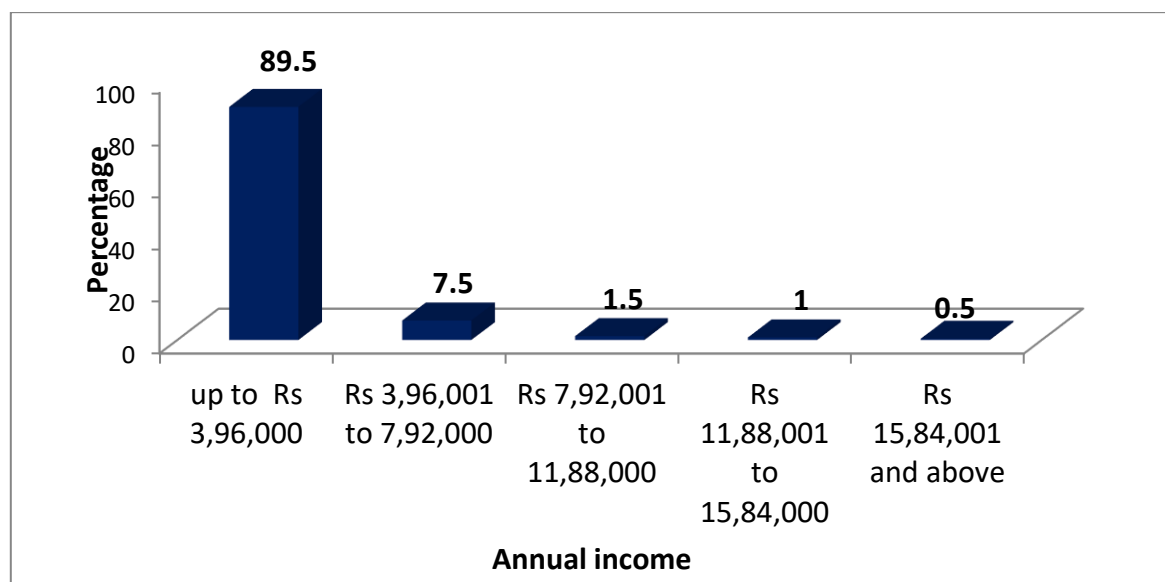


Figure 4: Distribution of respondents according to annual income

In case of individual crops, among respondents cultivating paddy the lowest income observed was Rs. 40,000/- and highest was Rs. 4,00,000/-. In case of rabi sorghum highest income of respondent was of Rs. 2,65,000/- whereas the lowest income was Rs. 40,000. In case of respondents cultivating gram, highest income of respondent was Rs. 3,00,000/- whereas the lowest income was Rs. 50,000/-. In case of green gram highest income of respondent was Rs. 7,00,000/-, whereas the lowest income was Rs. 20,000/-. In case of groundnut highest income of respondent was Rs. 3,50,000/- whereas the lowest income was Rs. 35,000/-. In case of soybean highest income of respondent was Rs. 50,000/- whereas the lowest income was Rs. 10,00,000/-. In case of respondents cultivating onion and tomato the highest income observed was Rs. 20,00,000 and Rs. 15,00,000 respectively whereas lowest income was Rs. 50,000.

4.1.5 Sources of Information

Sources of information refer to the various information channels used by the respondents for getting information about improved technology. The data regarding the sources of information used by the respondents were obtained and they were grouped into three categories given in Table 6. The mean was 8.10 with SD of 2.16.

Table 6: Distribution of the respondents according to their sources of information

Sr. No.	Sources of information (score)	Respondents (n=200)	
		Number	Per cent
1	Low (Up to 6)	48	24.00
2	Medium (7 to 10)	105	52.50
3	High (11 and above)	47	23.50
	Total	200	100.00

The data given in the Table 6 and figure 5 mentioned that 52.50 per cent of the respondents accessed to medium sources of information, while 24.00 per cent and 23.50 per cent of them had low and high sources of information respectively. The above results were in conformity with that of Mandal and De (2013) and Jadhav *et al* (2015).

Further, frequency and per cent of the item wise sources of information used by the respondents were worked out and the findings are presented in Table 9

Table 7: Distribution of respondents by the type of sources of information used by them

Sr. No.	Sources of information (score)	Respondents (n=200)	
		Number	Per cent
A	Individual contact		
1	Gramsevak	08	04.00
2	Agri. Extn. Officer	167	83.50
3	Progressive farmers	62	31.00
4	Krishi Vigyan Kendra	118	59.00
5	Rawe student	01	0.50
6	Local leader	04	04.00
7	Friend / neighbors / relatives	188	94.00
8	Other (private dealers, shop owners etc.)	30	15.00
B	Group contact		
1	Demonstrations	40	20.00
2	Group discussion	149	74.50
3	Educational trip	18	09.00
4	Meetings	156	78.00
5	Others	02	01.00
C	Mass contact		
1	Newspapers	155	77.50
2	Agriculture related literature	32	16.00
3	Television	135	67.50
4	Agril. exihibition	189	95.00
5	Shetkari melawa	174	87.00

Table 7 revealed that a majority (94.00%) of the respondents used friends / relatives / neighbors as their individual sources of information followed by 83.50 per cent who used Agriculture extension officer, 59.00 per cent who used Krishi Vigyan Kendra, 31.00 per cent who used progressive farmers, 15.00 per cent who used private dealers, shop owners etc., 4.00 per cent

who used local leaders, 4.00 per cent who used gramsevak and 0.5 per cent who used RAWES student as their individual sources of information. None of the respondents had contact with Scientist of State Agriculture University.

It is observed that 78.00 per cent respondents used meetings as a source of information in group contact. It was followed by 74.50 per cent of the respondents who used group discussion, 20.00 per cent of the respondents were using demonstrations, 09.00 per cent of the respondents were using educational trips and only two respondents (1.00 %) were using other means of group contact.

Among mass contact sources of information 95.00 per cent respondents used Agricultural exhibition as source of information, followed by 87.00 per cent of the respondents were using shetkari melawa, 77.50 per cent of the respondents were using newspapers, 67.50 per cent of the respondents were using television and 16.00 per cent of the respondents were using agriculture related literature. No respondent used radio as source of information.

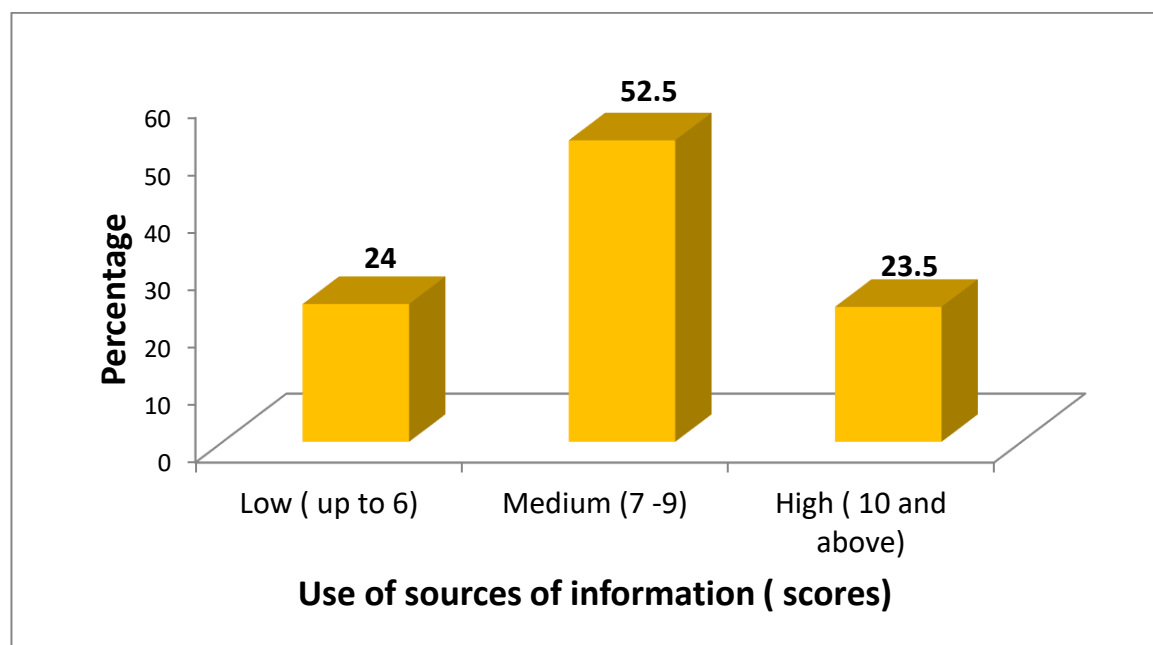


Figure 5: Distribution of respondents according to use of sources of information

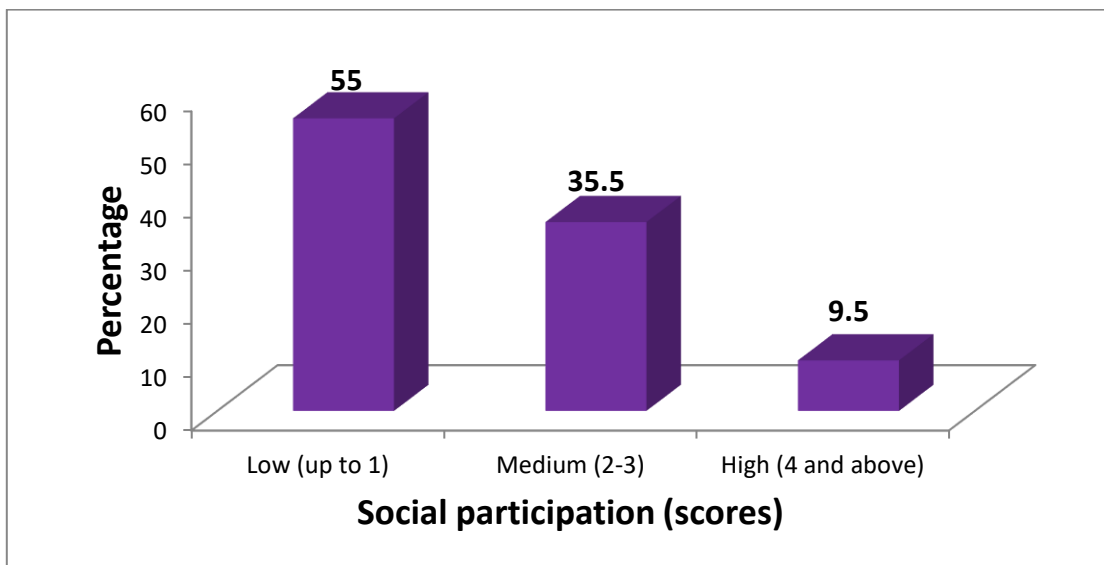
4.1.6 Social Participation

Table 8: Distribution of Respondents according to their social participation

Sr. No.	Social participation (score)	Respondents (n=200)	
		Number	Per cent
1	Low (Up to 1)	110	55.00
2	Medium (2 to 3)	89	35.50
3	High (4 and above)	01	9.50
	Total	200	100.00

Mean = 1.93 S.D. = 0.87

Table 8 and figure 6 indicated that more than half (55.00%) of the respondents had low social participation, while 35.50 per cent of the respondents had medium social participation followed by 9.50 per cent of the respondents were having high social participation. Social participation was thus low for majority of respondents. The finding cited above is similar to that of the findings of Kumar *et al* (2013).



6: Figure Distribution of respondents according to social participation

Further, frequency and per cent of the various sources of information used by the respondents were worked out and the findings are presented in Table 9.

Table 9: Distribution of the respondents by their particulars of social participation used by them

Sr. No.	Social participation (score)	Respondents (n=120)	
		Number	Per cent
1	Grampanchayat	05	02.50
2	Co-operative Institution	109	54.50
3	Self Help Group/ Farmers' group	110	55.00
4	APMC	10	05.00
5	Patasanstha	36	18.00
6	Others	04	02.00

Table 9 revealed that 55.00 per cent of the respondents had social participation in form of self-help groups/farmers group. It was followed by 54.50 per cent of the respondents who were having social participation through co-operative institution, followed by 18.00 per cent of the respondents through patasanstha. Only 5.00 per cent of the respondents participated socially through APMC, while 2.50 per cent of them were participating through Grampanchayat and 2 per cent through other institutions. No respondent had social participation through Panchayat Samiti, Zilha parishad and Youth club.

4.1.7 Cosmopoliteness

The data on cosmopoliteness of the respondents are presented in Table 10. The mean was 4.34 with SD of 0.66

Table 10: Distribution of respondents by their cosmopoliteness

Sr. No.	Cosmopoliteness (score)	Respondents (n=200)	
		Number	Per cent
1	Low (Up to 3)	53	44.16
2	Medium (4 to 5)	61	50.84
3	High (6 and above)	6	5.00
	Total	200	100.00

It is revealed from Table 10 and figure 7 that 50.83 per cent of the respondents were having medium level of cosmopolitanism followed by 44.16 per cent of them who were having low levels of cosmopolitanism. Only 5.00 per cent of them had high level of cosmopolitanism. The result indicated that majority of respondents had medium level of cosmopolitanism. It may be because majority of them had low annual income and cannot afford to go beyond their localities. The findings cited above are similar to the findings of Lawrence and Ganguli (2012).

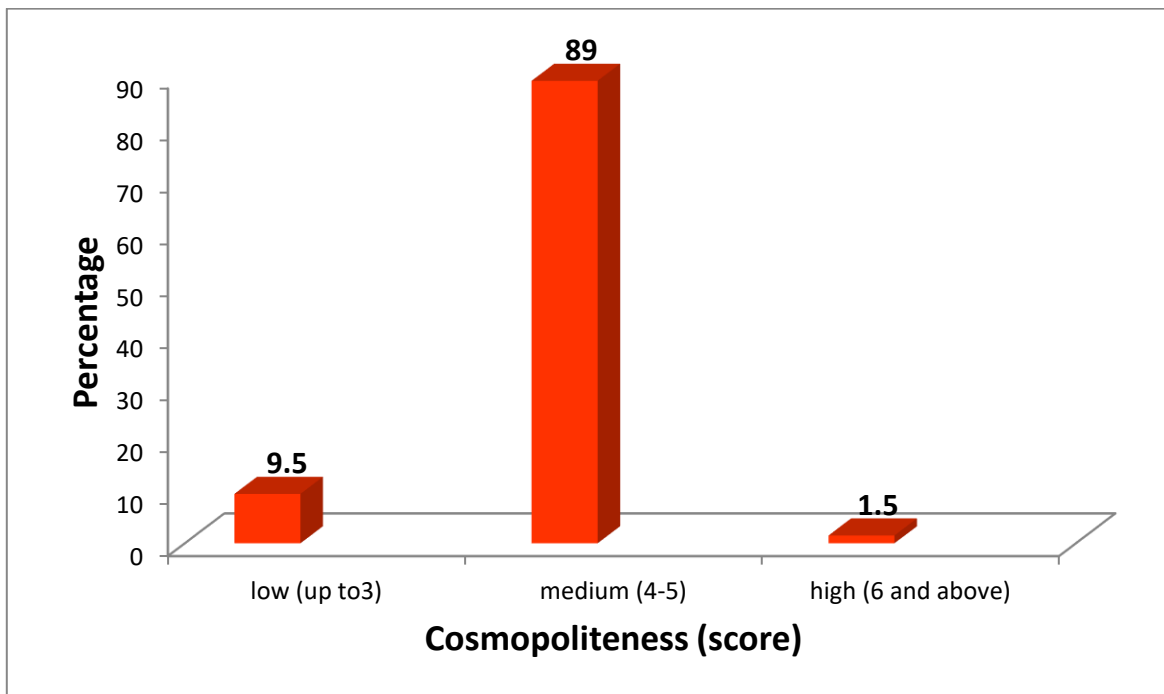


Figure 7: Distribution of respondents according to cosmopolitanism

Further, frequency and per cent of the various cosmopolitanism particulars used by the respondents were worked out and the findings are presented in Table 11.

Table 11: Distribution of the respondents by their particulars of cosmopolitenes

Sr. No	Types of cosmopolitenes	Daily		Weekly		Fortnightly		Monthly		Once in 3 months		Once in 6 months	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Other villages	165	82.50	25	12.50	10	5.00	-	-	-	-	-	-
2	Weekly market	0	0	125	62.50	26	13.00	-	-	-	-	-	-
3	Tehsil place	18	9.00	35	17.50	14	7.00	123	61.50	-	-	-	-
4	Other district place	-	-	-	-	-	-	146	73.00	54	27.00	-	-
5	Headquarter of state	-	-	-	-	-	-	24	12.00	24	12.00	51	25.50
6	Out of state	-	-	-	-	-	-	-	-	-	-	4	2.00

Data from table 11 reveals that 82.50, 12.50 and 5.00 per cent of the respondents visited other villages daily, weekly and fortnightly respectively. The weekly market was visited by 62.50 per cent of the respondents weekly and 13.00 per cent of the respondents fortnightly. Among respondents visiting tehsil place 61.00 per cent visited monthly, 17.50 per cent visited weekly, 9.00 per cent visited daily while 7.00 per cent visited fortnightly.

In case of other district places, 73.00 per cent of the respondents visited monthly while 27.00 per cent visited once in 3 months. Among respondents visiting headquarter of the state, 25.00 per cent respondents visited once in 6 months and 12.00 per cent visited monthly and another 12 per cent once in 3 months. While only 2.00 per cent of respondents went out of state once in 6 months.

4.1.8 Knowledge

Knowledge of farmers regarding improved varieties released by MPKV, Rahuri was tested as mentioned in the methodology.

Table 12: Distribution of respondents according to knowledge about improved varieties

Sr. No.	Knowledge (score)	Respondents (n=200)	
		Number	Per cent
1	Knowledge	158	79
2	No knowledge	42	21
Total		200	100

Table 12 and figure 8 reveal that 79 per cent of the respondents had knowledge about the improved varieties released by MPKV, Rahuri while 21 per cent of them did not have the same. Further crop wise knowledge of variety was investigated and results presented in table 12.1

Table 12.1: Crop wise knowledge of Variety released by MPKV, Rahuri

Sr. No.	Crop and variety		Respondents (n=25/crop)	
			Number	Per cent
1	Paddy	Indrayani	25	100.00
2	Sorghum	Phule Revati	25	100.00
3	Gram	Digvijay	25	100.00
4	Green Gram	Phule Vaibhav	23	92.00
5	Groundnut	Phule Pragati	25	100.00
6	Soybean	J.S.-335	25	100.00
7	Tomato	-	00	0
8	Onion	-	10	20.00

Table 12.1 shows that except tomato and onion (20.00%) crops, respondents had knowledge of varieties released by MPKV, Rahuri.

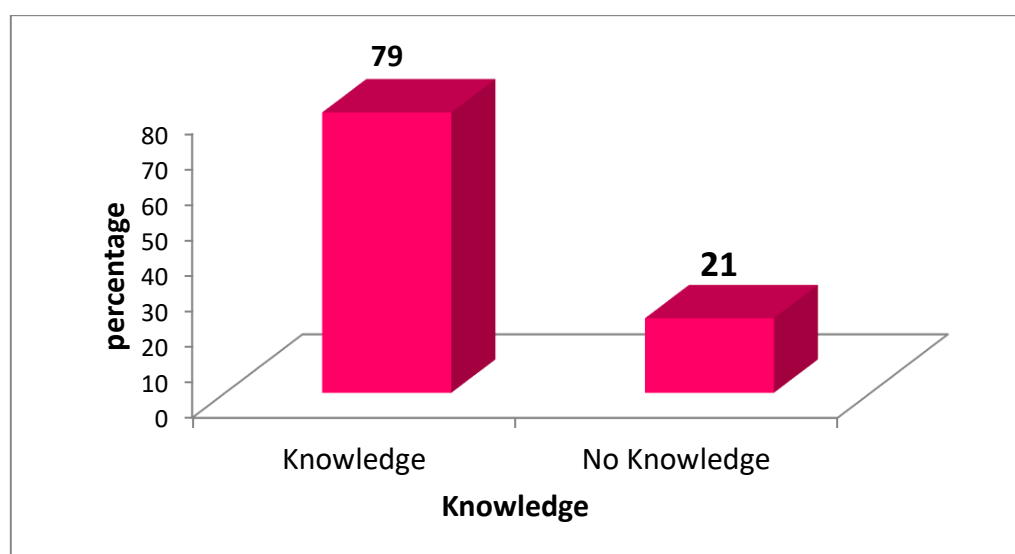


Figure 8: Distribution of respondents according to knowledge about improved varieties

4.2 Adoption of improved Varieties released by MPKV, Rahuri

Initially data of whether the improved variety released by the university was adopted was collected and tabulated as below.

Table 13: Distribution of respondents according to adoption of improved varieties

Sr. No.	Adoption (score)	Respondents (n=200)	
		Number	Per cent
1	Adopters	101	50.50
2	Non-adopters	99	49.50
Total		200	100

Table 13 and figure 9 reveals that about 50.50 percent of the respondents adopted the improved varieties of the various crops released by MPKV, Rahuri, while 49.50 per cent didn't adopt them at all.

Out of the 158 respondents who had knowledge of improved varieties only 101 adopted them and rest 57 did not adopt (table no 12 and 13 data)

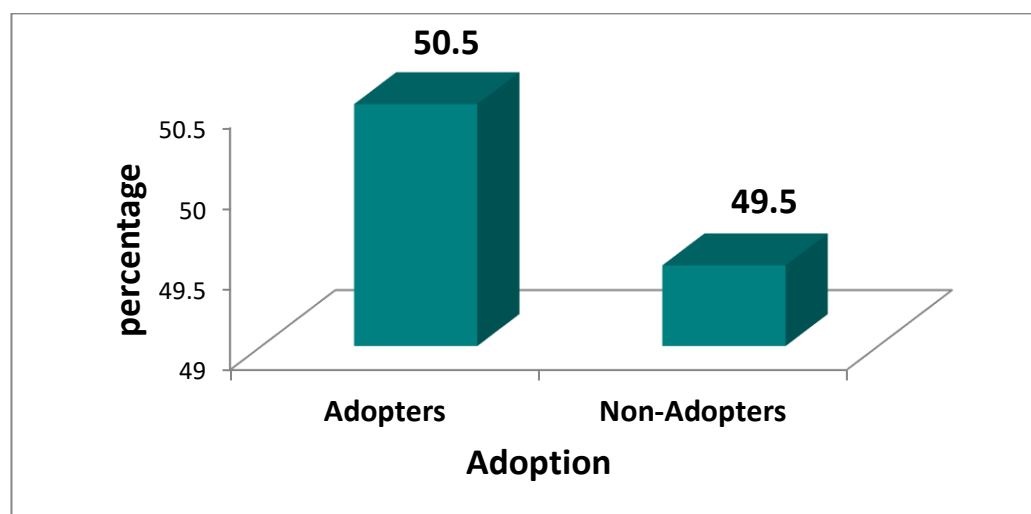


Figure 9: Distribution of respondents according to adoption

Table 14: Crops and Improved varieties which were adopted

Sr. No.	Crop and variety		Respondents (n=25/crop)	
			Number	Per cent
1	Paddy	Indrayani	25	100.00
2	Sorghum	Phule Revati	24	96.00
3	Gram	Digvijay	16	64.00
4	Green Gram	Phule Vaibhav	14	56.00
5	Groundnut	Phule Pragati	05	20.00
6	Soybean	J.S.-335	17	68.00
7	Tomato	-	00	0
8	Onion	-	00	0
Total			101	100

Data in Table 14 indicates that in case of paddy and sorghum there was highest adoption of improved varieties that is 100 and 96 per cent respectively. This was followed by soybean, gram and green gram with 68, 64 and 56 per cent of adoption respectively. Lowest adoption was in groundnut and there was no adoption in case of tomato and onion crops varieties.

Data clearly indicates the dominance of cereal varieties in adoption followed by pulses and oilseeds respectively. Vegetables varieties released by university have no adoption.

4.2.1 Level of adoption according to duration for which variety was adopted

Level of adoption was calculated by making categories of adoption duration of the eight crops among 101 adopters.

Table 15: Level of adoption based on duration of adoption of variety (years)

Sr. No.	Adoption level	Respondents (n=101)	
		Number	Per cent
1	Low (up to 2 years)	24	23.76
2	Medium (2.1 to 3 years)	38	37.62
3	High (3.1 years and above)	39	38.61
Total		101	100

Data in table 15 and figure 10 reveals that almost same number of respondents had adopted the variety for 3 years and above (38.61), and upto 3 years (37.62 per cent), followed by low level of adoption based on duration . It thus means that majority of adopters cultivated the improved varieties of the university for 2.1 years and above. The findings cited above is similar to that of the findings of Patel *et al* (2015).

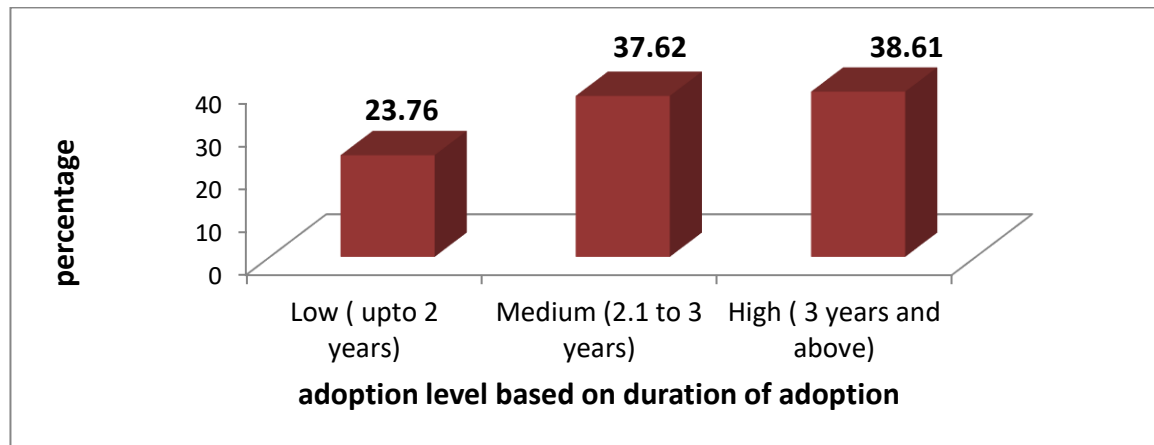


Figure 10: Distribution of respondents according to level of adoption based on duration of adoption

4.2.2 Reasons respondents preferred private varieties over improved varieties of university

It is important to know why the improved varieties of university were not adopted and thus reasons the respondents preferred varieties of private producers' over them would give an insight into the same.

Table 16: Reasons for adoption of varieties of private seed producer (Non-adopters)

Sr. No.	Reasons	Respondents (n=57)	
		Number	Per cent
1	Access to information about new varieties	15	26.31
2	Timely availability of seeds	14	24.56
3	Previous results of varieties were positive	12	21.05
4	Constant follow-up by private entities	08	14.03
5	Positive feedback of other adopters of same variety	08	14.03

Table 16 reveals that majority, i.e. 26.31 per cent farmers among non-adopters said that getting timely information about varieties of private producers was a reason for preferring those varieties. This was followed by 24.56 per cent respondents who said that timely availability of seeds was a reason for adoption. 21.05, 14.03 and 14.03 per cent farmers said that previous positive results, constant follow-up by private entities and positive feedback of fellow farmers about varieties respectively, were reasons for preferring improved varieties of private seed producers.

4.3 Constraints

Data was collected from respondents for the constraints they faced in adoption of improved varieties released by MPKV, Rahuri. The findings are presented in Table 17.

Table 17: Distribution of respondents (non-adopters) according to constraints faced in adoption of improved varieties

Sr. No.	Constraints	Respondents (n=57)	
		Number	Per cent
1	Not getting information of improved varieties	42	42.42
2	Non- availability of seeds	38	38.38
3	Previous results of varieties were negative	04	04.04
4	No technical knowledge regarding cultivation of varieties	05	05.05
5	Negative feedback of other adopters of same variety	03	03.03
6	Non-reliability of seeds other than saved seeds in terms of quality	30	30.30

Feedback from Table 17 reveals that, not getting information of improved varieties released by university was the major constraint in adopting those varieties as told by 42.42 per cent of non-adopters. Non-availability of seeds on time was another constraint as per 38.38 per cent respondents. Remarkably 30.30 per cent of respondents said that saved seeds were more reliable than other seeds.

Not having technical knowledge of cultivation of particular variety, negative previous results of varieties of university, and negative feedback of other adopters of same variety were expressed as constraints in adoption of improved varieties by 05.05, 04.04 and 03.03 per cent respondents respectively. The results were in conformity with Deshmukh *et al* (2007).

Table 17.1: Distribution of respondents (adopters) according to constraints faced in adoption of improved varieties.

Sr. No.	Constraints (adopters)	Respondents (n=101)	
		Number	Per cent
1	Exact time of seed availability not known	70	69.38
2	First come first basis and no facility of advance booking	62	61.38
3	Sales counter not available at all places	56	55.44
4	Limited quantity of seed	42	41.48

17.1 reveals that adopters faced constraint in getting information of availability of seeds as told by 69.38 per cent of farmers. No facility for advance booking as constraint was told by 61.38 per cent of farmers. Also inadequate sales counters and limited quantity of seed was constraint in proper adoption for 55.44 per cent and 41.48 per cent of the farmers respectively varieties released by MPKV, Rahuri.

4.3 Suggestions

Data was collected from respondents for the suggestions regarding adoption of improved Table The findings are presented in Table 18

Table 18: Distribution of respondents (adopters) according to constraints faced in adoption of improved varieties.

Sr. No.	Constraints (adopters)	Respondents (n=101)	
		Number	Per cent
1	Information regarding availability of seed should be made available at village level.	165	82.50
2	Seeds should be made available on the field through proper channels	162	81.00
3	Proper know how of the technicalities involved in cultivating should be conveyed	110	55.00
4	Follow up should be taken	90	45.00

Table 18 reveals that 82.50 per cent of farmers suggested that information regarding availability of seed should be made available at village level. 81 per cent farmers said that seeds should be made available readily. 55 per cent farmers said that know how about cultivating varieties should be known. 45 per cent of the respondents said that follow up regarding variety of seeds should be taken.

5. SUMMARY, CONCLUSION AND IMPLICATIONS

This chapter deals with summary of the findings of the study and implications for the future line of action and research. The present investigation “Study of adoption of improved varieties released by MPKV, Rahuri.” and the constraints and suggestions faced by them in adoption was designed and conducted. Eight crops namely paddy, rabi sorghum, Gram, Green gram, groundnut, soybean, tomato and onion were selected. The study was conducted in Ambegaon, Baramati, Junnar, Khed, Maval, Purandar, and Shirur tehsils of Pune District with 200 respondents.

The research study entitled was planned with following objectives.

1. Profile of respondents
2. Adoption level of improved varieties released by MPKV, Rahuri by respondents
3. Constraints faced by farmers in adoption of improved varieties
4. Suggestions made by the respondents to overcome the constraints

5.1 Summary

5.1.1 Profile of farmers

It was observed from the data that more than half of respondents (67.50 %) were from middle age group, one third of the respondents i.e. 37 per cent had completed their secondary level school education, 37.50 per cent of the respondents had semi-medium (2.01 to 4.00 ha) landholding and annual income of 89.50 per cent of respondents was up to Rs. 3,90,000.

It also revealed that a slightly more than half (52.50 %) of the respondents used medium sources of information, slightly more than half of the respondents (55.00 %) had low level of social participation and 89 per cent of the respondents had medium level of cosmopolitaness. It was observed that 79 per cent of the respondents had knowledge of the improved varieties released by university.

5.1.2 Adoption level of farmers of improved varieties released by MPKV, Rahuri

Data revealed that 50.50 per cent of respondents adopted the improved varieties and almost same number of respondents had medium and high level of adoption i.e. adopted the varieties for more than 2.1 years.

Data also revealed that majority of the respondents (26.31 %) who had knowledge of the improved varieties of the university but did not adopt it, numbered 57 (28.50 % of 200) said that non-access to information of improved variety was reason for non-adoption.

5.1.3 Constraints faced by respondents in adoption of improved variety

Data reveals that, not getting information of improved varieties released by university was the major constraint in adopting those varieties as told by 42.42 per cent of non-adopters. Non-availability of seeds on time was another constraint as per 38.38 per cent respondents. Remarkably 30.30 per cent of respondents said that saved seeds were more reliable than other seeds. Not having technical knowledge of cultivation of particular variety, negative previous results of varieties of university, and negative feedback of other adopters of same variety were expressed as constraints in adoption of improved varieties by 05.05, 04.04 and 03.03 per cent non-adopter respondents respectively

Data reveals that adopters faced constraint in getting information of availability of seeds as told by 69.38 per cent of farmers. No facility for advance booking as constraint was told by 61.38 per cent of farmers. Also inadequate sales counters and limited quantity of seed was constraint in proper adoption for 55.44 per cent and 41.48 per cent of the farmers respectively.

5.1.4 Suggestions made by respondents to overcome the constraints

Data reveals that 82.50 per cent of farmers suggested that information regarding availability of seed should be made available at village level. Respondents who said that seeds should be made available readily were 81 per cent. Respondents who said that know how about cultivating varieties should be known were 55 per cent. Respondents who said that follow up regarding variety of seeds should be taken were 45 per cent.

5.2 Conclusion

The study on the adoption of improved varieties released by MPKV, Rahuri clarified that respondents have medium use of sources of information and cosmopolitanism and have low social participation. More than half of the respondents were middle aged and had annual income up to Rs 3, 90,000/-. Majority of the respondents had completed their secondary level school education and had semi-medium size of land holding. More than two third of the respondents had knowledge about improved varieties released by MPKV, Rahuri.

In case of adoption, slightly more than half adopted varieties released by MPKV, Rahuri and major adoption was in case of varieties of paddy and rabi sorghum and least in case of tomato and onion crops. Adopters had adopted varieties for more than 2.1 years in more than half cases.

Major constraints faced by adopters and non- adopters were regarding access to information regarding released varieties of university and timely unavailability. Suggestions given by respondents are along the similar lines of availability of information and seeds.

5.3 Implications

Based on finding of the study one can safely recommend following implications

1. Information dissemination about varieties should happen through extension agencies like KVK, State agriculture Department, Agri-Research Institutes up to the village level.
2. Availability and accessibility of seeds should be enhanced through increased sales counters in research stations and distribution channels of the university should be spread out so as to reach the farmers on time.
3. In order to increase seed production, progressive farmers should be involved in seed production programmes and motivated to take up seed production. Assistance of Tehsil level seed multiplication centres can be taken in this regard.
4. Efforts should be taken to give information about variety and technical know-how of its cultivation prior to growing season, through different forms of mass media and literature.

6. LITERATURE CITED

- Anonymous, 2014. Agricultural Statistical Information, Pune District.
- Anonymous, 2015. Krushi Darshani, Mahatma Phule Krushi Vidyapeeth, Rahuri
- Badal, P. S., Kumar, P and Bisaria, G. 2007. Determinants of adoption of improved varieties of mungbean : A farm study in Rajasthan. . *Indian Re. J. of Ext. Edu. Vol,(7):35-37*
- Chaudhari, J. K., Patel, B. S. and Parikh, A. H. 2015. Impact of Krishi Vigyan Kendra on knowledge of farmers about improved agricultural technologies of wheat crop. *Guj. J. Ext. Edu. Vol, 26(1):30-32*
- Deshmukh .P. R., Kadam, R. P. and Shinde, V. N. 2007. Knowledge and adoption of agricultural technologies in Marathwada. *Indian Re. J. of Ext. Edu. Vol, 7 (1):41-43*
- Dhayal, B. L. and Mehta, B. M. 2015. Association between personal attributes of farmers with their knowledge and adoption of green gram production technology in Chhotaudaipur District. *Guj. J. Ext. Edu. Vol, 26(2):169-172*
- Dudi, A. and Meena, M. L. 2012. Adoption of improved mustard production technology in Pali district of Rajasthan . *International J. of Ext. Edu. Vol, (8):5-8*
- Ghadge, R. M. 2014. Constraints in adoption of improved production technology of mandarin. *Indian J. of Ext. Edu, Vol, (50), No 1&2:90-92.*
- Ghadge, R. M., Patinge, S.P. 2014. Utilization of information sources and their credibility for farm information perceived by the farmers. *Asian J. Ext. Edu. Vol,(32):87-89*
- Godawat, A. and Bhati, P. 2014. Constraints in adoption of guava cultivation technologies by the rural women. *Asian J. of Ext. Edu. Vol(32):27-29*
- Goswami, B., Ziauddin, G. and Datta, S. N. 2010. Adoption behaviour of fish farmers in relation to scientific fish culture practices in West Bengal. *Indian Res.J. Ext. Edu. Vol, 10 (1): 24-28*
- Hanglem, A., Saravanan, R. and Pradhan, K. 2015. Utilization pattern of communication sources among the farmers of Manipur. *Indian Research J. Ext. Edu. Vol, 15 (1):31-34*
- Jadhav, S.S., Sonawane, H.P., Shirke, V.S. 2014. Factors accountable for adoption of crop insurance scheme in India. *Asian J. Ext. Edu. Vol(32):59-61*

- Jakhar, P. R., Bangarva, G. S., Jat J. R. and Singh, S. 2015. Extent of adoption of recommended cultivation practices of mungbean in Nagaur district of Rajasthan. *Indian Re. J. of Ext. Edu. Vol, 15(1):49-52*
- Jeelani, R., Khandi, S. A., Beig, M. V., Kumar, P. and Bhadwal, M. S. 2014. Relationship of socio-economic profile of Gujjars (pastoralists) with knowledge and adoption of improved animal husbandry practices. *Indian J. of Ext. Edu. Vol,(50) 3&4:36-43*
- Kavad, S. D., Virdia, H. M. and Patel, G. R. 2015. Adoption status of nagli production technologies in the tribal district Dang of Gujarat. *Guj. J. Ext. Edu. Vol, 26(1):10-13*
- Kumar, P. G., Jyosthna, M. K. and Reddy, P. L. 2013. Knowledge and extent of adoption of improved practices of chickpea through KVK interventions. *J.Res. ANGRAU Vol, 41(3):58-63*
- Kumar, P., Rajak, S. K. and Meena, M. S. 2011. Prediction potentialities of socio-personal attributes on adoption of dairy farmers. *Indian Research J. of Ext. Edu. Vol, 11(1):122-123*
- Lawrence, C. and Ganguli, D. 2012. Entrepreneurial behaviour of dairy farmers in Tamil Nadu. *Indian Res. J. Ext. Edu. Vol, 12 (1):66-70*
- Mandal, B. K. and De, D. 2013. Factors affecting sources of information utilization. *Indian J. of Ext. Edu. Vol,(49) 1&2:93-95*
- Meena, S. L., Lakhera, J. P., Sharma, K. C. and Johri, S. K. 2012. Knowledge level and adoption pattern of rice production technology among farmers. *Rajasthan J. of Extn. Edu. Vol,(20): 133-137*
- Mistry, J. J., Vihol, K. J. and Patel, G. J. 2015. Adoption of recommended green gram cultivation technology by tribal FLD farmers. *Guj. J. Ext. Edu. Vol,, 26(1):71-73*
- Nirmala K. and Vasantha, R. 2013. Extent of adoption of system of rice intensification (sri) cultivation by farmers of Mahabubnagar district of Andhra Pradesh: a critique. *J. Res. ANGRAU, Vol, 41(4):49-53*
- P. Ganesh Kumar, M. K. Jyosthna and P. Lakshmi Reddy. Knowledge and extent of adoption of improved practices of chickpea through KVK interventions. *J.Res:ANGRAU, Vol,41(3):58-63*
- Panda, C. K. 2014. Information sources and technology adoption by farmers: An empirical study in Mohanpur block, West Tripura. *International J. of Ext. Edu. Vol,(10):80-87*

- Patel, K. H., Patel, U. M. and Khanorkar, S. M. 2015. Adoption of farmers about scientific cultivation of maize in Panchmahal and Dahod District. *Guj. J. Ext. Edu. Vol, 26(2)*: 223-227
- Patel, N. G., Patel, P. C. and Patel, J. B. 2015. Adoption of no-cost and low-cost technologies of watershed management by tribal farmer. *Guj. J. Ext. Edu. Vol, 26(1)*:86-88
- Patel, P., Patel, M. M., Badodia, S. K. and Sharma, P. 2014. Entrepreneurial behaviour of dairy farmers. *Indian Res. J. Ext. Edu Vol, 14 (2)*:46-49
- Prasad, D., Bareth, L. S., Jhingoniya, H. K., Keshri, A. K. and Sharma, S. 2015. Knowledge level of farmers about improved rice cultivation technology. *Indian J. of Ext. Edu. Vol, 51(3&4)*:108-111
- Roy, S., Bhagat, R. and Rao, D. U. M. 2007. Level of knowledge and extent of adoption of farmers on recommended gladiolus production practices. *Indian Re. J. of Ext. Edu. Vol, 7(2 & 3)*:69-71
- Sarada, O. and Kumar, G. V. S. 2013. Knowledge and Adoption of Recommended Production technology by cotton farmers. *J.Res. ANGRAU Vol, 41(4)*: 54-60
- Shirke, V. S., Thakur, S.V., Sonawane, H.P. 2014. Knowledge and Adoption of Plant Protection measures followed by the mango growers. *Asian J. of Ext. Edu. Vol (32)*:120-123
- Singh, P. K., Barman, K. K. and Varshney, J. G. 2011. Adoption behaviour of vegetable growers towards improved technologies. *Indian Re. J. of Ext. Edu. Vol, 11(1)*:62-65
- Soni, A. N., Soni, N. V. and Soni, D. N. 2015. Usefulness of information about maize production practices given during krushi mahotsav. *Gujarat J. Ext. Edu. Vol, (26)*:36-39
- Venkataramulu, M., Kumar, J. H., and Vishnu Vardhan, D. 2014. A comparative study on constraints in zero tillage and conventional maize cultivation. *The Journal of Research ANGRAU Vol, 42(2)*:30-34

APPENDIX

Appendix-I

H¥\$ {f ‘hm {dÚmb¶, nwUo
H¥\$ {f {dñVma {d^mJ
‘hmË‘m ‘w\$bo H¥\$ {f {dÚmnrR>, amhpar ¶oWyZ {dH\$ {gV Ho\$boë¶m
gwYm[aV dmUm\$À¶m Adb\$~ZmMm Aä¶mg

à~\$YH\$ - Hw\$. nyZ‘ {dbmg nmQ>o ‘mJ©Xe©H\$ - S>m°. nëbdr Xm. gy¶©d\$er

äíZmdbr

{d^mJ - n{hbm

- 1. eoVH\$è¶mMo Zm\$d ...
- 2. Jm\$d ... VmbwH\$m ...
{Oëhm ... nwUo ^«‘UÜdZr ...
- 3. d¶ ...
- 4. {ejU ...
- 5. EHy\$U dm{f©H\$ CËnÞ ...

A.H«\$.	CËnÞmMm ‘mJ©	CËnÞ
1.	eoVrVyZ	
2.	eoVr gb½Z	
3.	Aä¶mgmImbrb {nH\$mVyZ	
4.	ZmoH\$ar	
5.	ì¶dgm¶	
6.	BVa	
	EHy\$U é.	

6. YmaU Ho\$b\$obr O‘rZ

A.H«\$.	O{‘ZrMm àH\$ma	joÌ (ho³Q>a)
1.	~mJm¶V	
2.	{Oam¶V	
3.	nS>rH\$	
	EHy\$U	

7. ‘m{hVrMo ñlmoV

(gmYmaU eoVrgmR>r Am{U gwYm[aV dmUm\$À¶m ‘m{hVrgmR>r)

A.H«\$.	‘m{hVr òmoV	eoVrgmR>r		gwYmarV dmUmgmR>r	
		hmo¶	Zmhr	hmo¶	Zmhr
A)	<u>¶p³VJV g\$ñH©\$ ‘mÜ¶‘o</u>				
1.	J«m‘godH\$				
2.	H¥\$ {f {dñVma A{YH\$mar				
3.	g\$emoYH\$ (H¥\$ {f {dÚmnrR>)				
4.	H¥\$ {f {dkmZ H ĐĐ ({deofk)				
5.	àJVerb eoVH\$ar				
6.	amdo {dÚmWu				
7.	ñWm{ZH\$ ZoVo				
8.	{‘Ì / eoOmar / ZmVodmB©H\$				
9.	BVa				
~)	<u>¶p³VJV g\$ñH©\$ ‘mÜ¶‘o</u>				
1.	àmĚ¶{jHo\$				
2.	JQ> MMm©				
3.	ejj{UH\$ ghb				
4.	g^m / ~jR>H\$				
5.	BVa				
H\$)	<u>gm‘w{hH\$ g\$ñH©\$ ‘mÜ¶‘o</u>				
1.	dV©‘mZnÌ				
2.	H¥\$ {f {df¶H\$ gm{hĚ¶				
3.	AmH\$medmUr				
4.	XÿaXe©Z				
5.	H¥\$ {f àXe©Z				
6.	eoVH\$ar ‘oimdo				

A.H<\$.	'm{hVr òmoV	eoVrgmR>r		gwYmarV dmUmgmR>r	
		hmo¶	Zmhr	hmo¶	Zmhr
7.	BVa				

8. gm'm{OH\$ g\$ñWmVrb gh^mJ -

A.H<\$.	g\$ñWoMo Zm\$ð	g^mgX	
		hmo¶	Zmhr
1.	J«m'n\$Mm¶V		
2.	n\$Mm¶V g{'Vr		
3.	{Oëhm n[afX		
4.	ghH\$mar g\$ñWm		
5.	~MV JQ>		
6.	¶wdH\$ n\$M		
7.	ejj{UH\$ g\$ñWm		
8.	H¥\$f CËnP ~Oma g{'Vr		
9.	nVg\$ñWm		
10.	BVa		

9. ~mø OJVmer g\$ñH©\$ -

A.H<\$.	g\$ñWoMo Zm\$ð	hmo¶	Zmhr	g\$ñH\$m©Mm H\$mbmdYr		
1.	AmR>dS>çmMm ~mOma			XaamoO	n\$YadS>m	'{hZm
2.	Vmbw³¶mMo {R>H\$mU			AmR>dS>m	n\$YadS>m	'{hZm
3.	BVa {Oëô¶mMo {R>H\$mU			AmR>dS>m	n\$YadS>m	'{hZm
4.	amÁ¶mMo 'w»¶mb¶			'm{gH\$	Ìi'm{gH\$	fÝ'm{gH\$
5.	amÁ¶m~mhoa			'm{gH\$	Ìi'm{gH\$	fÝ'm{gH\$
6.	BVa			'm{gH\$	Ìi'm{gH\$	fÝ'm{gH\$

{d^mJ - Xbgam

1. dmUm~Ôb 'm{hVr ...

- Aä¶mgmImbrb {nH\$... ^mV/aã~r
Ádmar/ha~am/'yJ/gmo¶m{~Z/^wB©'yJ/Q>mo'mQ>mo/ H\$m\$Xm
- dmU

A) eoVH\$è¶mH\$S>o {nH\$ {dÊ¶mV ¶oUmè¶m BVa {nH\$m\$Mr ‘m{hVr -

A.H«\$.	{nH\$	joĭ (ho.)	dmU
1.			
2.			
3.			
4.			
5.			

~) Aä¶mgmImbrb dmU dmnaÊ¶mV ¶oUmam H\$mbmdYr ... df} ‘{hZo

H\$) Adb\$~Zm~Ôb ‘m{hVr ...-

A.H«\$.	Vnerb	hmo¶	Zmhr
1.	dmU ‘.’w\$.H¥\$. {d.Zo {dH\$ {gV Ho\$bobo Amho H\$m\$?		
2.	dmU ‘.’w\$.H¥\$. {d.Mo Zgob Va H\$maUo -		
	A) ‘m{hVr Z {‘iUo		
	~) CnbãYVm ZgUo		
	H\$) dmU Z nadS>Uo		
	S>) dmUmMm AJmoXaMm AZw^d Mm\$Jbm ZgUo		
	B©) {nH\$ bmJdS>r~Ôb Vm\$ {ĪH\$ ‘m{hVr ZgUo		
	’\$) BVa eoVH\$è¶m\$À¶m ZH\$mamĒ‘H\$ ‘Vm\$Mm / AZw^dmMm à^md		

A.H«\$.	Vnerb	hmo¶	Zmhr
3.	‘.’w\$.H¥\$. {d. {edm¶ BVa dmU (ImOJr) KoÊ¶mMr H\$maUo		
	A) ‘m{hVr {‘iUo		
	~) CnbãYVm AgUo		
	H\$) dmU nadS>Uo		
	S>) dmUmMm AJmoXaMm AZw^d Mm\$Jbm AgUo		
	B©) ImOJr H\$ \$nZr H\$Sy>Z gVVMm nmR>nwamdm KoVbm OmUo		
	’\$) BVa eoVH\$è¶m\$À¶m gH\$mamĒ‘H\$ ‘Vm\$Mm / AZw^dmMm à^md		

H\$) eoVH\$è¶m\$Zr {Xbobo gēbo -

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