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Prashant Sinoriya

1) Assistant Professor,
Department of Agriculture,
Mandsaur University, Mandsaur,
Madhya Pradesh, India
2) College of Agriculture,
Jawaharlal Nehru Krishi Vishwa
Vidyalaya, Jabalpur,
Madhya Pradesh, India

Dr. VK Pyasi

College of Agriculture,
Jawaharlal Nehru
Krishi Vishwa Vidyalaya,
Jabalpur, Madhya Pradesh,
India

Mamta Vyas

Assistant Professor, Department
of Agriculture, Mandsaur
University, Mandsaur,
Madhya Pradesh, India

Corresponding Author:**Prashant Sinoriya**

1) Assistant Professor,
Department of Agriculture,
Mandsaur University, Mandsaur,
Madhya Pradesh, India
2) College of Agriculture,
Jawaharlal Nehru Krishi Vishwa
Vidyalaya, Jabalpur,
Madhya Pradesh, India

Profile of sesame growers and identify the communication channels in the process of adoption of new technology of sesame in block Prathavipur district Tikamgarh

Prashant Sinoriya, Dr. VK Pyasi and Mamta Vyas

Abstract

Sesame (Sesamum indicum L.) is a very ancient and important annual oil seed crop in the World. India is a major producer of this crop in the world and occupies well over 38% of total acreage and contributes about 26 percent of the total production. Sesame is usually rich in oil (50%) and protein (18-20%). Nearly 78 percent of the sesame seed produced in India is used for oil extraction, 2.5 percent for planting purposes and the rich in used in confection and in religious Hindu ceremonies. Nearly 73 percent of the oil is used for edible purposes, 8.3 percent of hydrogenation, 4.2 percent for industrial purposes in the manufactures of paints, pharmaceuticals and insecticides. Seeds are eaten fried and mixed with sugar and in several forms in sweet meals. A hundred gram of seeds provided 592 calories. Sesame oil is important cooking oil in south India. It is really the poor man's substitute for 'ghee'. It is also used as a perfumed oil as it does not itself possess any strong order, especially after it is kept for some time and is able to absorb the fragrant essence of sweet-scented flowers. It is also used as a cattle feed specially for milch animal. It can be used as manner. It has a vast field of applications such as edible purposes, in industries like paints, pharmaceuticals, insecticides, cosmetics, soap making etc. Sesame is also used as a cattle feed especially for milch animals and as manure due to presence of 6-6.2% N. 2-2.2% P and 1-1.2% K in its cake (Singh *et al.* 2009).

Keywords: Sesame, adoption, farmers, technology, innovative, production, communication channel

Introduction

Sesame (*Sesamum indicum L.*) has many different names, which vary from one country to another. It is known as benniseed, benne, gingelly, gengelin, Tila, and sim-sim or semsemin in Africa, Southern United States, India, Brazil, Sanskrit, and Hebrew, respectively. It belongs to Pedaliaceae family, it is the seeds of tropical annual *sesamum indicum*. Sesame was discovered in its original home in Africa and then moved to both China and India, where it is considered one of the oldest and most important oil seeds known to mankind. Furthermore, it is distinguished with economically important and widely distributed overall the world, however, it is heavily grown in developing countries compared to developed countries. The sesame varieties spread throughout the Middle East are comparable to those found in Africa, where they are thought to have moved to it from Africa through Egypt. Sesame has been classified in different colors varies from white, yellow, red, brown, gray, to black.

Sesame seeds are used in various food and snack preparations as well as insalad dressing. The importance of the sesame crop in the whole world is increasing due to its a rich source of calcium, phosphorus, and protein, in addition, to being an economic oil. Sesame seeds contain the highest oil compared to any other oilseed to an extent of 50% and above. Most of the sesame seeds are used for oil production which is extensively used for cooking purposes and a small percentage is also used in cosmetics, perfumery industries, and pharmaceuticals, while the rest is used for edible purposes.

In Madhya Pradesh sesame is mainly grown in Chhatarpur, Tikamgarh, Sidhi, Shahdol, Morena, Shivpuri, Sagar, Damoh, Jabalpur, Mandala, East Nimar and Seoni districts of the state. The average yield of sesame in M.P. is 387 kg/ha. Being in Central Plateau and Hills region VIII of agro-climatic zone. (Anonymous, 2012-13) ^[1].

In Madhya Pradesh this crop covers total area 266920 hectare with production of 158070 tone and productivity 592 kg per hectare (MP Krishi). In Tikamgarh district has 40792 hectare with production of and productivity 367 kg/hectare.

Objectives of the Study

1. To study the profile of sesame growers.
2. To identify the communication channel in the process of adoption of new technology of sesame.

Review of Literature**1. Profile of Selected Farmers**

This chapter presents the findings of the past research works related to the present problem by going through the professional research journals, articles, documents, approved theses, books and magazines in order to keep up-to-date information which are presented in following sub heads.

1. Profile of sesame growers.
2. Communication channels in the process of adoption of new technology of sesame production.

1.1 Age

- A. Asati (2000) [2] found that out of total, 50 per cent of the sesame growers belonged to young age group. He concluded that majority of the farmers (86%) were of middle age.
- B. Khaterkar (2004) [11] reported that majority of the soybean growers belonged to old age group.
- C. Rajput (2005) [23] reported that majority of the respondents belonged to middle age group.

1.2 Education

- A. Rajput (1993) [38] found that 44.00 per cent respondents had education up to middle level.
- B. Asati (2000) [2] concluded that (35.00%) of the sesame growers had primary level of education.

1.3 Annual Income

- A. Pachouri (1990) [17] reported that 48 per cent of sesame growers had low annual income.
- B. Kawale *et al.* (2003) [10] found that majority of the respondents belonged to medium annual income group
- C. Mahoriya (2006) [15] found that majority of farmers had low income.
- D. Patidar (2007) [19] found that higher percentage (59.17%) of respondents belonged to medium annual income group.
- E. Raghuvansi (2010) [22] concluded that higher percentage of the soybean growers i.e. 41.67 per cent had medium annual income.

1.4 Occupation

Prajapati (2006) [36] reported that majority of the growers (61.67%) belonged to farming occupation category.

1.5 Size of Land Holding

- A. Prajapati (2006) [36] reported that more than half of the total (51.66%) respondents had small size of land holding.
- B. Garg (2010) [7] reported that higher percentage (55.83%) of respondents had medium size (2.1 to 3 ha) of land holding.
- C. Khobragade *et al.* (1988) [12] found that majority (41.00%) of the respondents had marginal land holding.

1.6 Area under Sesame

- A. Sagar *et al.* (2004) [22] concluded that majority of the small and marginal farmers are associated with the cultivation of sesame in Sundarbans.
- B. Prajapati (1997) [21] reported that majority of the responded growing pulses and oilseed crops had medium size of land holding.

1.7 Social Participation

- A. Kawale *et al.* (2003) [10] revealed that majority of the sesame growers were having membership in only one social organization.
- B. Singh (2003) [32] concluded that majority of the sesame growers (80.00%) had no participation in any social organization.
- C. Rajput (2005) [23] reported that majority of the sesame growers (76.67%) had low participation in any organization.

1.8 Contact with Extension Agencies

- A. Singh and Singh (1999) [31] concluded that majority of respondents were having had low contact with extension participation with extension agencies.
- B. Garg (2010) [7] reported that higher percentage (50%) of respondents had low contact with extension agencies.

1.9 Mass Media Exposure

- A. Prajapati (2006) [36] reported that maximum (51.67%) respondents had poor mass media exposure.
- B. Patidar (2007) [19] found that higher percentage of farmer (68.33%) was belonged to low mass media exposure.

1.10 Innovativeness

Rangnathan (1997) [24] noticed that majority of the respondents had low category regarding innovativeness.

B. Dependent Variable**1.11 Adoption Level**

- A. Singh *et al.* (2002) [30], reported that an adoption gap evident for recommended HYV, seed treatment fertilizer application and plant protection measure for the crop Bajra Sesame and Guar among both beneficiary and non-beneficiary farmer.
- B. Raghuvansi (2010) [22] concluded that majority of respondents (52.50%) exhibited low adoption behaviors of improved soybean production technology.

2. Communication Channel in the Process of Adoption of New Technology of Sesame Production

- A. Duhnai and Rao (1969) [6] observed gram Sevak was the most common source of the first information.
- B. Joshi *et al.* (2002) [9] revealed that the RAEO was most important sources of information for the contact farmers followed by most progressive farmer and other contact farmer among attributes of contact farmers the attributes which show positive and significant relationship with there information seeking behavior should be considered during selection of contacts farmers under the T&V system.
- C. Dubey (2011) [5] concluded that a study on adoption of improved agriculture farm practices in Barale block and concluded that VLWs was the first change agent working neighbours, friends and relatives,

3. Relationship between Dependent and Independent Variables**3.1 Age**

- A. Aske (2008) [3] reported that the age of soybean growers had no association with adoption.
- B. Machhar *et al.* (2015) [14] reported that age was significantly but positively correlated with the technological gap

3.2 Education

- A. Prajapati (1997) ^[21] reported that close association between education level of the farmers and their adoption regarding improved technology of pulse and oilseed crops in demonstration.
- B. Sharma *et al.* (2005) ^[26] reported that education had positive and significant association with adoption.
- C. Singh (2009) ^[29] reported that the education level of farmers had significant association with adoption of oil seed production technology.

3.3 Total annual Income

- A. Shinde (1997) ^[27] reported that annual income had positive and significant correlation with adoption of groundnut production technology.
- B. Lokhande (2007) ^[13] reported that total annual income of sesame growers were positively and significantly relation with adoption of IPM.

3.4. Size of Land Holding

- A. Girase *et al.* (1991) ^[8] observed that no significant association was observed in respect of size of land holding with the adoption of groundnut production technology by the farmer.
- B. Sharma *et al.* (2005) ^[26] reported that size of land holding had non-significant association with adoption.

3.5 Area under Sesame Crop

- A. Meti *et al.* (1997) ^[16] concluded that area covered under groundnut was positive association with adoption of groundnut production technology.
- B. Shinde (1997) ^[27] reported that area covered under groundnut was significant correlation with adoption of groundnut production technology.

3.6 Contact with Extension Agencies

- A. Wabhitkar *et al.* (1990) ^[35] found that the contact with development agencies of the farmers was observed to be positively and significantly association with adoption of production technology.
- B. Singh (1999) ^[31] revealed that extension contact was found to have positive significant relationship with adoption level.

3.7 Innovativeness

- A. Bhadoriya *et al.* (2011) ^[4] revealed that nine variables namely education, size of land holding, credit availability, social participation, contact with extension personnel, innovativeness, cosmopolitanism, knowledge about organic farming and annual income were found having significant association with dependent variable perception of farmers about organic farming.
- B. Garg *et al.* (2010) ^[7] revealed that the independent characteristics of farmers i.e. education, size of family, social participation, size of land holding, credit availability, annual income, source of information, contact with extension personnel, mass media exposure, innovativeness, cosmopolitanism, agricultural belief and knowledge were found significantly correlated with their adoption behavior about organic farming while age was found to be non-significant.
- C. Pawar *et al.* (2012) ^[20] the study was conducted to determine the extent of utilization regarding eco-friendly practices among the tribal farmers of Sidhi district of Madhya Pradesh. The study indicates that the characteristics of the tribal farmers like, size of land

holding, farming experience, sources of information, contact with extension agencies, mass-media exposure, innovativeness, economic motivation, risk orientation. Decision making had significant relationship with their utilization pattern of eco-friendly farming practices at 0.05 level of probability.

4. Credibility of the Various Communication Channels as Perceived by the Sesame Growers

1. Umale (1979) ^[33] revealed that the overall credibility ranks were in the favour of village workers demonstration, neighbours, farm magazines, progressive farmer and friends in descending order as there mean was greater than the overall mean. The credibility sources and channels were agriculture extension officer, newspapers, exhibition, radio and relatives. Concluded that through the farmer placed credibility to the informal information sources but adoption rate was higher among those who used formal information sources. The finding of this study suggests that there is a necessary of changing the information on sources credibility of the farmer in order to develop their rationality which helps in making them to adopt more innovation.
2. Vijayaraghavan and Subramania (1981)^[34] concluded that for the garden land farmers, the most credible source of information was Deputy Director Agriculture Officer followed by Gram Sevek, relatives, friends and neighbours, literature and commercial agencies. For the dry land farmer s the most credible source of information was Gram Sevek followed by friends and neighbours, Deputy Director Agriculture Officer, radio, commercial agencies and literature. In the both cases the least credible source was agencies and literature.

Method and Material

Sampling Technique Used

1. Locale of the Study

The study was conducted in Tikamgarh district of Madhya Pradesh. Tikamgarh district is located in the North part of the state. It lies between North latitude 24.26° to 25.34° and East longitude 78.26° to 79.21° the shape of district is triangular. It is surrounded in the West by Lalitpur of Uttar pradesh, in the East by Chhatarpur, in the North by Jhansi and in the South by Sagar districts. The western and eastern boundries are formed by two big rivers. The district takes its name from the headquarter town as Tihri, in Orchha state. In 1783 Raja Vikramajit shifted his capital from Orchha town to Tihri and renamed it as Tikamgarh, but it was officially recognized in 1887. The name adopted in the honour of Lord Krishna, Tikam being on of his appellations.

The total geographical area of the Tikamgarh district is 5048.00 sq.Km. and the population of 1444920 (2011 census), of which 7,59,891 are males (50.9%) and remaining 6,85,029 are females (49.1%) the literacy level 73.30 percent in male and 50.70 per cent in female (2011).

The district Tikamgarh covers an area of 5.04 lakh ha, out of which 2.56 lakh ha comes under net sown area. The district has two important agriculture seasons viz., kharif and Rabi. In kharif, mainly soyabean, groundnut, maize, arhar, moong and in rabi mainly wheat and gram are sown. The oilseed crops grown in the district are rape and mustard, groundnut, linseed, sesame, soyabean.

3. Selection of Block

Tikamgarh district consists of 6 blocks. The study was confined in Prathvipur block, which was selected purposively on the basis of small area covered and less production of sesame crop.

Table 1: Block wise distribution of area, production and productivity of sesame in Tikamgarh district 2014-15

S. No.	Name of Block	Area	Production	Productivity
		(ha.)	(Quintals)	(kg/ha)
1.	Tikamgarh	4840	19940.8	412
2.	Baldevgarh	7215	25252.5	350
3.	Jatara	9210	33616.5	365
4.	Palera	9012	32893.8	365
5.	Niwari	6410	21794	340
6.	Prathvipur	4105	15188.5	370

(Source: District Director of Agriculture office Tikamgarh)

3. Selection of Villages

A list of sesame growing villages of Prithvipur block was prepared with the help of RAEs and out of which 10 villages were selected randomly.

4. Selection of Respondents

A list of farmers of each selected villages, who were growing

sesame crop has been prepared with the help of respective RAEs and other officials. Sesame crop growers were selected by using proportionate random sampling method hence, the total number of selected farmers were 120.

The name of the selected villages and number of respondents selected from each villages are given in Table 3.2

Table 2: Village wise distribution of sesame growers and selected respondents (sesame growers) of Prathvipur block.

S. No	Name of selected villages	Total no. of sesame growers	No. of selected respondents
1.	Madiya	150	08
2.	Mavai	275	15
3.	Acharumata gram	90	06
4.	Nigora	220	12
5.	Luhargao	130	09
6.	Prathvipur	300	18
7.	Chandrapura	280	19
8.	Sukerbhata	150	09
9.	Senuganv	380	14
10	Sujanpur	150	10
	Total	2125	120

Table 3: Selection of Variables, definitions, measurements, scoring procedure and categorization.

S. No.	Variables	Measurements
A. Independent Variables		
Socio economic Variables		
1	Age	Chronological age
2	Education status	Trivedi & Pareek (1963)
3	Total annual income	In rupees
4	Occupation	Trivedi & Pareek (1963)
5	Size of land holding	In hectares
6	Area under sesame crop	In hectares
7	Social Participation	Self-scoring
Communication Variables		
8.	Information source Utilization	Nandapurkar(1982)
9	Contact with ext. agencies	Self-scoring
10	Mass media exposure	Desai (1977)
Psychological Variables		
11	Innovativeness	Self-scoring
12	Economic motivation	Supre & Singh (1969)
13	Scientific orientation	Supre & Singh (1969)
B. Dependent Variable		
14	Adoption of new technology of sesame production	Self-scoring

The relevant variables for the present study were identified and selected on the basis of extensive review of available literature and through discussion with the experts in the field of extension education. All the important variables, needed for investigation have been considered in line with the objectives were incorporated in this study.

Variables, their Operationalization Measurements

Keeping in view the objectives of the study, the independent

and dependent variable for the study were as follows:-

5. Variables and their Measurement

A Independent Variables

- Age:** Age was operationalised as the number of years an individual has completed at the time of interview and was measured as per chronological age of individual. On the basis of data collected, the categories developed were as follows:-

Table 4: Table basis on age factor

S. No.	Categories	Scores
1.	Young age	Up to 35 years
2.	Middle age	36 to 60 years
3.	Old age	Above 60 years

2. Education

It refers to the formal education attained by an individual. All the respondents were classified into four groups according to the number of years of their education:

Table 5: Table basis on education criteria

S. No.	Categories	Scores
1.	Illiterate	0
2.	Up to Primary School	1
3.	Middle School	2
4.	High and higher secondary school	3
5	Collegelevel	4

3. Size of Land Holding

It refers to an area of total cultivated land possessed by the respondents (in hectares) for the purpose of cultivation. The respondents were categorized in the following categories.

Table 6: Table basis on size of land holding

S. No.	Categories	Scores
1.	Marginal farmers	(Up to 1 ha)
2.	Small farmers	(1.01 to 2 ha)
3.	Medium farmers	(2.01 to 4 ha)
4.	Large farmers	(Above 4 ha)

4. Area under Sesame Crop

It refers to an area (in hectare) of land possessed by a respondent for the purpose of cultivation of sesame crop and is measured on the basis of allotment of scores. Scores of 1, 2, 3, n were allotted for an area of 1, 2, 3, n hectare of land under sesame. The categories of land under sesame formulated were-

Table 7: Table basis on area under sesame crop

S. No.	Categories	Scores
1.	Area Up to 1 ha	1
2.	Area 1.1 to 2 ha	2
3.	Area 2.1 to 4 ha	3
4.	Area above 4 ha	4

5. Contact with Extension Agencies

Extension contact has been operationally defined as the frequency of contact of respondents with extension personnel and extension agencies for seeking information about improve farming practices of sesame crop. It was measured on three point continuum as most often, often and the never and were give score 2, 1 and 0, respectively. On this basis of range of score the respondents were categorized into three groups, as-

Table 8: Contact with extension agencies

S. No.	Categories	Score
1.	Low extension contact	Up to 3
2.	Medium extension contact	4-6
3.	High extension contact	Above 6

6. Innovativeness

Innovativeness is operationally defined as the degree to which a farmer is relatively earlier in adopting new ideas. It is a

degree of mental preparedness to perceive the new recommended eco-friendly practices. A three point's scale is used to measure the innovativeness of respondents. The scores were assigned for expression of respondents against each statement were 2, 1, and 0 for fully agree, partially agree, disagree. The total score of each respondent was calculated and according to the score obtained by them the respondents were categorized into following three categories.

Table 9: Table basis on innovativeness

S. No.	Categories	Scores
1.	Low innovativeness	1 to 3
2.	Medium innovativeness	4 to 6
3.	High innovativeness	7 to 9

Dependent Variable

7. Adoption of New Technology of Sesame Crop Production

It refers to the actual use of the technology of sesame crop production. The basic object of the whole agricultural research is to ensure maximum utilization of new technology of sesame crop by the crop growers. To measure the adoption level, responses were recorded on three-point continuum as complete, partial and no adoption and assigned the scores of 2, 1 and 0, respectively. On the basis of range of scores, the respondents were categorized into low, medium and high groups.

Table 10: Table basis on adoption of new technology of sesame crop production

S. No.	Categories	Scores
1.	Low adoption level	1 to 10
2.	Medium adoption level	11 to 21
3.	High adoption level	22 to 32

8. Instruments and Methods of Data Collection

The interview schedule was designed for collection of the relevant information of selected variables. The questions in interview schedule framed were simple, clear and directly related to the purpose of the study and were arranged in logical sequence. The data were collected personally with the help of a pre-tested interview schedule from respondents in Prathvipur block in order to be sure of the correctness in response. The respondents were personally contacted. They were assured that the information given by them would be kept confidential and it would only be used for the academic purposes.

The relevance of each question in the context of the objectives of the study, their logical order and working of question etc. were carefully checked.

Practically, all the respondents had answered the questions fully, which was indicative of the fact that good rapport could be established between the investigator and the respondents.

Processing and Statistical Analysis of Data

Data collected were qualitative as well as quantitative. The quantitative data were interpreted in terms of percentage and the qualitative data were tabulated on the basis of approved categorization method as described earlier. The following statistical techniques were used in the study.

1. Percentage
2. Mean
3. Chi-square
4. Rank order.

A. Percentage

Percentage was used for making simple comparison. For calculating percentage, frequency was multiplied by 100 and divided by total number of observation of respondents in the particular category.

B. Mean

The mean is defined as the arithmetic average of distribution of scores. It is determined by adding the scores and dividing the sum by the number of scores. Symbolically the mean is given below:

$$\bar{X} = \frac{\sum X_i}{n}$$

Where, \bar{X} = As a symbol for the mean of sample, Σ = Sum of the total Number, n = Total number of scores in the distribution

C. Chi-Square

Test to determine whether two attributes are independent by comparison of observed frequencies related to expected frequencies, the chi-square test was applied.

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

D. Procedure

First we have to calculate the expected value of the two nominal variables. We can calculate the expected value of the two nominal variables by using this formula:

Where, E_i = expected value, N = total number

After calculating the expected value, we will apply the following formula to calculate the value of the Chi-Square test of Independence:

- Chi-Square test of Independence
- Observed value of two nominal variables
- Expected value of two nominal variables

Validity and Reliability of Instrument

Validity refers to whether the data collection instrument measure what is supposed to measure. The validity of interview schedule for this study was maximized by taking the following steps:-

1. The interview schedule was thoroughly discussed with the members of the authority, advisory committee and their suggestions were incorporated.
2. Pre-testing of the interview schedule provide an additional check for *improving* the instrument
3. The relevance of each question in terms of the objectives was checked carefully
4. Reliability of an interview schedule refers to its consistency. It has been observed property, that the interview had reliability before it was used as a data collection instrument

Hypotheses of the Study

Relevant hypotheses were formulated on the basis of the study and was tested in the null form, as follows: _

1. There is no significant association between age of sesame crop growers and their adoption level of new technology of sesame crop production.
2. There is no significant association between level of education of sesame crop growers and their adoption level of new technology of sesame crop production.

3. There is no significant association between occupation of sesame crop growers and their adoption level of new technology of sesame crop production.
4. There is no significant association between annual income of sesame crop growers and their adoption level of new technology of sesame crop production.
5. There is no significant association between total size of land holding of sesame crop growers and their adoption level of new technology of sesame crop production.
6. There is no significant association between area under sesame crop of sesame crop growers and their adoption level of new technology of sesame crop production.
7. There is no significant association between social participation of sesame crop growers and their adoption level of new technology of sesame crop production.

Result

Profile of Sesame Growers

The variables selected and studied as independent variables had age, education, total annual Income, occupation, size of land holding, area under sesame crop, social participation, information source utilization, contact with extension agencies, mass media exposure, Economic motivation, scientific orientation and adoption of new technology of sesame production are presented here.

1. Age

Table 11: Distribution of sesame growers according to their age:

S. No.	Categories	Frequency	Percentage
1.	Young (up to 35 years)	20	16.66
2.	Middle age (36 to 60 years)	72	60.00
3.	Old age (Above 60 years)	28	23.34
Total		120	100.00

The data of the table 4.1 reveals that out of the total 120 sesame growers, 60.00 per cent belonged to middle age group, 23.34 per cent belonged to old age and 16.66 per cent belonged to young age group.

Thus, It may be concluded that majority of Sesame growers (60.00%) had of middle age group.

2. Education Level

Table 12: Distribution of sesame farmers according to their education level

S.No.	Categories	Frequency	Percentage
1	Illiterate	23	19.17
2.	Primary education	51	42.50
3.	Middle education	15	12.50
5.	Higher secondary education	20	16.67
6.	College education	11	9.16
Total		120	100.00

The data of the table 4.2 reveals that out of the total sesame growers, 42.50 per cent of the respondents received education up to primary level, followed by 19.17 percent, illiterate level, 16.67 per cent were having higher secondary education, 12.50 per cent had of middle education level and 9.16 per cent had having education up to college level.

Thus, it can be concluded that the majority of sesame growers (42.50%) had having education up to primary level.

3. Annual Income

Table 13: Distribution of sesame growers according to their annual income

S. No.	Categories	Frequency	Percentage
1.	Low(Rs.30000 to 100000)	38	31.67
2.	Medium(Rs.100001 to 170000)	62	51.67
3.	High(Rs. 170001 to 240000)	20	16.66
Total		120	100.00

Table 4.4 reveals that out of the total sesame growers 51.67 percent had having medium annual income, followed by 31.67 percent had low annual income and only 16.66 percent of the sesame had high annual income. Therefore, it can be concluded that higher percentage (51.67%) of sesame growers had medium annual income.

4. Occupation

Table 14: Distribution of sesame crop growers according to occupation

S. No.	Categories	Frequency	Percentage
1.	Solely farming	42	35.00
2.	Farming + labour	30	25.00
3.	Farming + Cast occupation Dairy	28	23.33
4.	Farming +Shop keeping +Self employment	12	10.00
5.	Farming + services	8	6.67
Total		120	100

The data of the table 4.4 reveals that out of the total 120 sesame growers, 35.00 per cent had solely depend on farming as their main occupation. As regard to other subsidiary occupations had concerned,25.00 percent followed by farming +labour, 23.33 percent had forming +caste occupation +dairy, 10.00 per cent had farming +shop keeping +self-employment and 6.67 percent had forming +services as their main occupation.

Thus, it may be concluded that the higher percentage of sesame growers (35.00%) had solely engaged in farming as their main occupation.

5. Size of Land Holding

Table 15: Distribution of sesame farmers according to their land holding:

S.No.	Categories	Frequency	Percentage
1.	Marginal farmers (Up to 1 ha.)	12	10.00
2.	Small farmers (1.1 to 2 ha)	28	23.33
3.	Medium farmers(2.1 to 4 ha)	55	45.83
4.	Large farmers (Above 4 ha)	25	20.84
Total		120	100.00

The data of the table 4.5 reveals that out of the total, 45.83 per cent growers had medium land holding, followed by 23.33 per cent had small holding, 20.84 per cent had large land holding and only 10.00 per cent had marginal land holding. Thus, it may be concluded that the higher percentage of sesame growers (45.83%) had having medium land holding.

6. Area under Sesame Crop

Table 16: Distribution of sesame crop growers according to their area under sesame crop

S.No.	Area covered	Frequency	Percentage
1.	Area up to 1 ha.	25	20.83
2.	Area 1.1 to 2 ha	48	40.00

3.	Area 2.1 to 4 ha	35	29.17
4.	Area Above 4 ha	12	10.00
Total		120	100.00

The data of the table 4.6 reveals that out of the total, 40.00 per cent sesame growers were having small land holding, followed by 29.17 per cent were having medium land holding, 20.83 per cent had marginal land holding and 10 per cent had large land holding. Thus, it may be concluded that the higher percentage of sesame growers (40.00%) had having small land holding.

7. Social Participation

Table 17: Distribution of sesame farmers according to their social participation:-

S. No	Categories	Frequency	Percentage
1.	Low social participation(up to 5)	50	41.67
2.	Medium social participation(6 to 10)	62	51.66
3.	Large social participation (11 to 14)	8	6.67
Total		120	100.00

The data of the table 4.7 shows that out of the total 120 sesame growers, 51.66 per cent had medium level of participation, followed by 41.67 per cent had low level of social participation, 6.67 per cent had high level of participation, it may be concluded that the higher percentage of sesame growers (51.66%) per cent had having medium level of social participation.

8. Contact with Extension Agencies

Table 18: Distribution of sesame crop growers according to their contact with agencies

S.No.	Categories	Frequency	Percentage
1.	Low (Up to 3)	85	70.83
2..	Medium (4 to 6)	25	20.84
3.	High (Above 6)	10	8.33
Total		120	100.00

The data of the table 4.9 reveals that out of the total 120 sesame growers, 70.83 per cent had low contact with extension agencies, followed by 20.84 per cent had medium level of contact with extension agencies, 8.33 per cent had high level of contact with extension agencies. Thus, it may be concluded that the higher percentage of sesame growers (70.83%) had having low contact with extension agencies.

9. Mass media Exposure

Table 19: Distribution of sesame farmers according to their mass media exposure

S.No.	Categories	Frequency	Percentage
1.	Low (1 to 3)	78	65.00
2.	Medium (4 to 6)	28	23.33
3.	High (7 to 9)	14	11.67
Total		120	100.00

The data of table 4.10 indicates that out of total sesame growers, 65.00 per cent had in the category of low mass media exposure, followed by 23.33 per cent had medium mass media exposure, and only 11.00 per cent growers had found in high mass media exposure. Thus, it may be concluded that the majority of the total growers (65.00%) had low exposure to mass media.

10. Innovativeness

Table 20: Distribution of sesame crop growers according to their innovativeness:

S.No.	Categories	Frequency	Percentage
1.	Low (1 to 3)	65	54.16
2.	Medium (4 to 6)	32	26.67
3.	High (7 to 9)	23	19.17
	Total	120	100.00

The data of table 4.10 indicates that out of total sesame growers, 54.16 per cent had in the category of low innovativeness, followed by 26.67 per cent had medium category of innovativeness, and only 19.17 per cent growers had found in high level of innovativeness. Thus, it may be

concluded that the high majority of the total growers (54.16%) had low level of innovativeness.

11. Adoption Level

To identify the communication channel in the process of adoption of new technology of sesame production:

Table 21: Distribution of the respondents based on the use of different communication channels in the process of adoption of new technology of sesame production.

Stages of adoption process	Communication channels					
	Interpersonal Channels		Mass media		Total	
	Fre.	%	Fre.	%	Fre.	%
Awareness	76	63.33	44	36.67	120	100
Interest	98	81.66	22	18.34	120	100
Evaluation	83	69.17	37	30.83	120	100
Testing	78	65	42	35	120	100
Evaluation	67	55.83	53	44.17	120	100
Mean	80.4	67	39.6	33	120	100

It is clear from the above table that in awareness stage the maximum numbers of respondent 63.33 per cent had using interpersonal channels as communication channels. In the mass media channels maximum numbers of respondents 36.67 per cent had used as communication channels.

In interest stage the maximum numbers of respondent (81.66%) had using as interpersonal channels for adopting of new technology. In the mass media channels maximum numbers of respondent 18.34 per cent had used communication channels for adopting new technology.

In evaluation stage the maximum number of respondents 69.17 percent had using as interpersonal channels for adopting of new technology. In the mass media channels maximum number of respondents 30.83 per cent had used communication channels for adopting new technology.

In testing stage the maximum number of respondents 65 percent had using as interpersonal channels for adopting of new technology. In the mass media channels maximum number of respondents 35 per cent had used communication channels for adopting new technology.

In the last stage of adoption the maximum numbers of respondent 55.83 per cent used interpersonal channels for

adopting of new technology. In the mass media channels the maximum numbers of respondent 44.17 per cent had used communication channels for adopting new technology.

Thus, it can be concluded from the data the higher per cent of respondents (67%) had using interpersonal channels as the most effective communication channels in the process of adoption of new technology of sesame production.

Table 22: Distribution of sesame crop growers according to their Adoption level

S. No.	Categories	Frequency	Percentage
1.	Low (up to 10)	36	30.00
2.	Medium(11to21)	65	54.16
3.	High (Above 21)	19	15.84
	Total	120	100.00

The data of the table 4.2.2 reveals that out of the total sesame growers, 54.16 per cent had medium adoption level, followed by 30.00 per cent had low adoption level and 15.84 per cent had high adoption level. Thus, it may be concluded that the higher percentage of sesame growers (54.16%) had having medium adoption level.

Table 23: Association between education of sesame growers and adoption level in adoption level:

S. No	Education	Adoption level			Total
		Low	Medium	High	
1	Illiterate	16 (69.56)	5 (21.73)	2 (8.69)	23 (100.00)
2	Up to Primary education	6 (11.76)	41 (80.39)	4(7.84)	51 (100.00)
3	Up to Middle education	7 (46.66)	5 (33.33)	3 (20.00)	15 (100.00)
4	Up to Higher secondary education	4 (20.00)	9 (45.00)	7 (35.00)	20 (100.00)
5	Up to College education	3 (27.27)	5 (45.45)	3 (27.27)	11 (100.00)
	Total	36	65	19	120.00

(Figures in parentheses indicate percentage)

As the cell frequency had less than five; therefore, it was pooled for the purpose of calculating chi-square test and table

be as follows

Table 24: Association between annual income of sesame growers and adoption level:

S. no.	Annual income	Adoption level			Total
		Low	Medium	High	
1	Low	21 (55.26)	14 (36.84)	03 (7.89)	38 (100.00)
2	Medium	12 (19.35)	43 (69.35)	7 (11.29)	62 (100.00)
3	High	3 (15.00)	8 (40.00)	9 (45.00)	20 (100.00)
	Total	36	65	19	120

(Figures in parentheses indicate percentage)

As the cell frequencies had less than five; therefore, it was pooled for the purpose of calculating chi-square test and table be as follows

Table 25: Association between annual income of sesame growers and adoption level:

S.No.	Annual Income	Adoption level		Total
		Low	Medium+ High	
1	Low Income	21	17	38
2	Medium Income + High Income	15	67	82
	Total	36	84	120

$\chi^2 = 15.19$, Significant at 0.01 level of probability with 1 d.f. Table value= 6.635

Table 4.2.5 shows the association between annual income of growers and adoption level in sesame production technology. It is clear from the data of the table that out of 38 sesame growers, who had under low annual income, 55.26 per cent had low adoption level followed by 36.84 per cent medium and 7.89 per cent had high adoption level in new technology of sesame production. While out of 62 medium income

growers 69.35 per cent of respondents had medium and 19.35 per cent had low adoption level and 11.29 per cent high adoption level of new technology of sesame production, While out of 20 high income growers 45 per cent of respondents had high and 40 per cent had medium and, 15 per cent had low adoption level of new technology of sesame production.

Table 26: Association between size of land holding of sesame growers and adoption level:

S. NO	Land Holding	Adoption level			Total
		Low	Medium	High	
1	Marginal (Up to 1 ha)	7 (58.33)	4 (33.33)	1 (8.33)	12 (100.00)
2	Small (1.1 to 2 ha)	10 (35.71)	13 (46.42)	5 (17.85)	28 (100.00)
3	Medium (2.1 to 3 ha)	11 (20.00)	37 (67.27)	7 (12.72)	55 (100.00)
4	Large (above 3 ha)	8 (32.00)	11 (44.00)	6 (24.00)	25 (100.00)
	Total	36	65	19	120

(Figures in parentheses indicate percentage)

As the cell frequency had less than five; therefore, it was pooled for the purpose of calculating chi-square test and table be as follows :-

Table 27: Association between size of land holding of sesame growers and adoption level

S. No	Land Holding	Adoption level			Total
		Low	Medium	High	
1	Marginal + Small	17	17	6	40
2	Medium	11	37	7	55
3	Large	8	11	6	25
	Total	36	65	19	120

$\chi^2 = 8.58$, Non-Significant at 0.05 level of probability with 1d.f. Table value = 5.991

Table 4.2.6 reveals that out of 12 sesame growers having marginal land holding, 58.33 per cent had low adoption level, 33.33 per cent had medium and 8.33 per cent had high adoption level. While out of 28.00 sesame growers having small land holding, 46.42 per cent had medium, 35.71 per cent had low and 17.85 per cent had high adoption level. Whereas out of 55 sesame growers having medium land holding, 67.27 per cent had medium, 20.00 per cent had low and 12.72 per cent had high adoption level. Out of 25.00 sesame growers having large land holding, 44.00 per cent had medium, 32.00 per cent had low and 24.00 per cent had high

adoption level towards improved sesame production technology.

The chi-square value 8.58 was found significant at 0.05 level of probability with 2 degree of freedom hence, it can be concluded that there was significant association between size of land holding and adoption level of new technology of sesame production.

Discussion

5.1 Profile of Sesame Growers

1. Age

The study inferred that higher percentage (60%) of the respondents belonged to middle age group (36-60 years). This finding is in accordance with the results obtained by Parey (2000), Rajput (2005) [23], Mahoviya (2006) [15], Dwivedi (2007)

2. Education

In case of education, maximum percentage of sesame growers (42.50%) was found to be educated up to primary education level category. This finding is supported by Kawale *et al.* (2003) [10], Lokhande (2007) [13] and Raghuwanshi (2010) [22], Rajput (1993) [38]

3. Total annual Income

It is evident from the study that maximum percentage sesame growers (51.67%) were having medium income. This finding

is supported by Kawale *et al.* (2003) ^[10], Raghuwansi (2010) ^[22], Prajapati (2006) ^[36] and Patidar (2007) ^[19].

4. Occupation

The finding regarding occupation revealed that maximum numbers of sesame growers (35.00%) were having solely engaged in farming as their main occupation. This finding is supported by Prajapati (2006) ^[36].

5. Size of Land Holding

The finding regarding total size of land holding revealed that maximum number of sesame growers (45.83%) were having medium land holding. This finding is supported by Garg (2010) ^[7].

6. Area under Sesame Crop

The finding regarding total area under sesame crop revealed that maximum number of sesame growers (40.00%) were having medium land holding. This finding is supported by Prajapati (1997) ^[21].

7. Social Participation

The findings regarding social participation revealed that higher percentage of sesame growers (51.66%) were in medium social participation category. This finding is supported by Kawale *et al.* (2003) ^[10].

9. Contact with Extension Agencies

The findings regarding contact with extension agencies revealed that maximum numbers of sesame growers (70.83%) were having low contact with extension agencies. However, Singh and Singh (1999) ^[31] and Garg (2010) ^[7] reported that the maximum number of respondents were in low contact with extension agencies.

10. Mass media Exposure

The findings regarding mass media exposure revealed that maximum number of sesame growers (65.00%) had low level of mass media exposure. The finding is supported by Prajapati (2006) ^[36] and Patidar (2007) ^[19].

11. Innovativeness

The findings regarding innovativeness revealed that maximum number of sesame growers (54.16%) had low level of innovativeness. The finding is supported by Rangnathan (1997) ^[24].

12. Adoption Level

The findings regarding adoption level inferred that most of the sesame growers (54.16%) had medium adoption level. The results of Lokhande (2007) ^[13] support the above finding.

5.2 Identify the communication channel in the process of adoption of new technology of sesame production

Regarding the use of different communication channels in the process of adoption of new technology of sesame production maximum percentage of respondents (64%) were using interpersonal channels. This finding is supported by Dubey (1961), Roy *et al.* (1968), Duhnai and Rao (1969) ^[6], Chouhan *et al.* (2001) Joshi *et al.* (2002) ^[9] and Singh *et al.* (2002) ^[32].

5.3 Association between Independents and Dependant Variables

It is clear from the results that out of variables regarding socioeconomic, communication and psychological variables, viz., age education, total annual income, occupation, area under sesame crop, social participation, information source utilization, contact with extension agencies, mass media exposure, innovativeness scientific orientation by sesame growers. However, the variable viz. size of land holding was found to have no relationship with adoption new technology of sesame production. The variable-wise discussion is presented below.

The age of sesame growers had showed significant association with adoption of new technology of sesame production. This leads to the rejection of the hypothesis Ho-1. The work of Wabhitkaret *et al.* (1999) ^[35] a Sharma *et al.* (2005) ^[26] support the present finding.

Summary, Conclusion and Suggestions for Further Work

Summary

Sesame (*Sesamum indicum* L) is a very ancient and important annual oil seed crop in the world (Asatii, 2000) it is very important crop due to its edible OH, protein content protein quality, vitamins and amino acids. Sesame seeds have approximately 50 per cent oil and 25 per cent protein. Sesame is one of the most important oil seed crops of the world cultivated over an area of 7.8 million ha with a production of about 3.84 million metric tonnes of grains and the productivity of 0.48 tonnes per ha in 2010. It is very high prized oil crop of India. Recently, India and China are the world largest producer of sesame crop. In India sesame crop occupies an area of 1.82 million ha with production 0.62 million tonnes and its productivity is 0.34 tonnes per ha.

Communication of farm information is a crucial factor in the modernization of agricultural technology. The research in this field is growing fast but the communication is not taking place with the same speed. It must be considered as one of the prime objective of the present research work to increasing the margin and profit among the farmers. But there is the lack of communication between the farmers implementing the practices and actually recommended by the scientists. Individuals intend to use different communication media for obtaining the new technology. For accepting any innovation by the former in various socio - personals and farm situations, different types of communication media are required. The farmers use information from various sources like the neighbors, friends, relatives, other progressive formers, RAEOs, agriculture scientists (as inter personal channels) and news papers, radio, television (as mass media channels) etc Hence, keeping in view the importance of the various communication channels in adoption of sesame production technology, an attempt will be helpful in evolving a better communication channel.

Objectives of the Study

1. To study the profile of sesame growers.
2. To identify the communication channel in the process of adoption of new technology of sesame production.

For this study, the multi-stage random sampling technique was use for selection of block, villages and respondents. The study was carried out in one block i.e. Prathvipur block of Tikamgarh district of Madhya Pradesh, which was selected purposively for the study on the basis of small area and less production of sesame crop. The total sample size was 120 sesame growers selected from 10 villages. The study was focused to know the adoption level of sesame growers in

relation to socio-personal, psychological and communicational variables of the farmers i.e. age, education, total annual income, occupation, size of land holding, area under sesame crop, social participation, information source utilization, contact with extension agencies, mass media exposure, cosmopolitaness and scientific orientation were selected as independent variables, while adoption of new technology of sesame production as dependent variable. The primary data were collected personally by interviewing the selected respondents with the help of structural and pre-tested interview schedule. The secondary data were collected from various government departments, journals, publications and statistics department the data were analyzed through computer using frequency, percentage, chi-square test and association between dependent and independent variables.

2. Conclusions

After the collection of data and its statistical processing, the major findings of the present study can be summarized as follows:-

6.1 Profile of Sesame Growers

1. It was observed that the majority of the farmers (58.33%) were formally not educated.
2. The majority of the farmers (78.33%) were formally educated.
3. The higher percentages of the farmers (38.33%) had in low annual income category.
4. The higher percentages of the farmers (35.00%) had in solely farming occupation category.
5. The higher percentages of the farmers (43.33%) had in medium size of land holding category.
6. The higher percentages of the farmers (36.67%) had in medium area under sesame crop.
7. The majority of the farmers (66.67%) were in low social participation category.
8. The majority of the farmers (63.33%) were in low information source utilization category.
9. The majority of farmers (58.33%) were in no contact with extension agencies category.
10. The majority of farmers (58.33%) were in low mass media exposure.
11. More than half of the total farmers (63.33%) were in low cosmopolitaness category.
12. The majority of farmers (61.67%) were in medium scientific orientation category.
13. More than half of the total farmers (63.33%) were in medium adoption level category.

Identify the Communication Channel in the Process of Adoption of New Technology of Sesame Production

Maximum numbers of respondent who were using RAEOs as interpersonal channel at over all stages of adoption process was 28.67 percent followed by 26.00 per cent were using neighbours and 25.00 percent were using progressive farmers for adopting of new technology. In the mass media channels maximum numbers of respondent 11.60 per cent were used television followed by 05.70 per cent were used newspapers and 03.50 per cent were used radio.

Association between Independents and Dependent Variables

The association between various attributes of sesame growers like age, education, total annual income, occupation, area under sesame crop, social participation, information source

utilization, contact with extension agencies, mass media exposure, cosmopolitaness and scientific orientation, were found to be significant with adoption of new technology of sesame production., whereas only size of land holding has showed non-significant association with adoption of new technology of sesame.

Credibility of the Various Communication Channels as Perceived by the Sesame Growers

The finding of the present investigation indicate that the credibility of the various communication channels as perceived by the growers in adoption of new technology of sesame production were the interpersonal communication channels at over all stages of adoption process was RAEOs (25.33%) was ranked 1st by the growers followed by progressive farmers (25.00%) was ranked 2nd, neighbors (21.67%) was ranked 3rd. whereas regard to mass media communication channels the growers ranked television (15.00%) was ranked 1st followed by newspapers (07.50%) was ranked 2nd and radio (05.50%) was ranked 3rd.

Suggestions for Further Work

1. The present study was confined to ten villages only. Hence, the results may not be applicable to large area.
2. In this study, the dependent and independent variables were limited and therefore, further studies may be taken up based on situational and infrastructure variables.
3. Replication of research may be planned for studying different sesame growing areas under various agro-climatic zones of the state.
4. For appropriate generalization, similar work should be undertaken on a large scale in different categories of farmers.
5. More intensive statistical techniques should be used for improving contribution of different variables which might be given more strength to the study.

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