IMPACT ANALYSIS OF DEMONSTRATION ON TRANSPLANTING METHOD OF REDGRAM CULTIVATION IN BIDAR DISTRICT OF KARNATAKA STATE

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IMPACT ANALYSIS OF DEMONSTRATION ON TRANSPLANTING METHOD OF REDGRAM CULTIVATION IN BIDAR DISTRICT OF KARNATAKA STATE

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BY

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CERTIFICATE

This is to certify that the thesis entitled **"IMPACT ANALYSIS OF DEMONSTRATION ON TRANSPLANTING METHOD OF REDGRAM CULTIVATION IN BIDAR DISTRICT OF KARNATAKA"** submitted by **Mr. RAMAKRISHNA S HOSAKOTI** for the degree of **MASTER OF SCIENCE (AGRICULTURE)** in **AGRICULTURAL EXTENSION EDUCATION** to the University of Agricultural Sciences, Raichur, is a record of research work carried out by him during the period of his study in this university, under my guidance and supervision and the thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar titles.

Place : Raichur

Date : June, 2012

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RAICHUR

JULY, 2012 (RAMAKRISHNA S HOSAKOTI)

Affectionately Dedicated to

My Amazing Family

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Introduction

I. INTRODUCTION

Agriculture is one of the most important professions in both developed and developing countries which provide food stuff to human beings and raw materials to various agro- based industries. It continues to be the main stay of Indian economy and an effective antidote to poverty and unemployment. Recognizing its importance in the economic development of the country, sustained efforts have been made for improving agriculture during the successive five year plans. A number of policy decisions have been taken to give a high priority to agriculture and of late, the production of pulses have been identified as the thrust area considering the dietary, economic and other associated factors.

Pulses play an important role in Indian agricultural economy as they are rich sources of proteins and constitute 10 to 15 per cent of India's food grain diet. Major portion of Indian population belongs to vegetarian group and every person on an average is required to consume 70 to 80 gm of pulses per day in order to maintain good health and physique, according to the recommendations of Indian Council of Medical Research.

India is the largest producer and consumer of pulses in the world accounting for 33 per cent of the world area and 27 per cent of the world production of pulses. In India, pulses were grown on 23 million hectares area with a production of 15 million tones, with a yield of 600 kg per hectare (agropedia.iitk.ac.in, 2010). Besides their high nutritional value, pulse crops have a unique characteristic of maintaining and restoring soil fertility through nitrogen fixation. Their cultivation improves the physical characteristics of the soil through their deep and well spread root system. The pulse crops add more nitrogen to the soil than the nitrogen provided by the chemical fertilizers.

Redgram or Tur or Arhar (*Cajanus cajan* (L) Millsp) belongs to family Fabaceae' and is a protein rich staple food and consumed in the form of split pulse as Dal, but also consumed as vegetable in many countries. Redgram is of dietary importance with seed protein content of about 21 per cent, which is highest in the case of legumes. It is originated in Asia and being cultivated from 3000 years. It is a perennial shrub and a short annual crop in India and as a perennial in many other countries, where pods are harvested at regular interval. The crop has deep root system and cultivated in wide range of soils from black clay to sandy soil, but very sensitive to waterlogged conditions. Being a drought resistant crop, it is suitable for dryland farming. The main producing regions are Indian subcontinent, Eastern Africa and Central

America. It ranks second important pulse crop next to bengalgram. It finds important place in farming systems adopted by small holding peasants in large number of developing countries.

Redgram is grown throughout the world especially in South Asia, Eastern and Southern Africa, Latin America, Caribbean countries and Australia. According to FAO statistics, worldwide redgram was grown in about 4.64 million hectares and its production was 3.43 million tonnes having productivity of 780 kg per ha in 2008.

India occupies 90 percent of world redgram area and accounts for 80 per cent of world production of redgram. In India redgram is mainly grown in Maharashtra, Madhya Pradesh, Rajasthan, Uttar Pradesh, Andhra Pradesh and Karnataka. Maharashtra is the leading producer of redgram followed by Madhya Pradesh (www.indiastat.com). According to fourth advanced estimates of 2010-11 released redgram occupies an area of 4.42 million hectares and production of about 2.89 million tonnes, having an average yield of 655 kg per ha.

In Karnataka redgram is largely grown in northern parts, especially in Gulbarga and Bidar districts. Hyderabad- Karnataka region is called as pulse bowl of Karnataka and redgram is one of the most important pulse crop grown in this region. The state occupies an area of about 6.04 lakh hectares with a production of 2.79 lakh tonnes, having an average productivity of 487 kgs per ha. Gulbarga has an area of about 3.37 lakh hectares with production of 1.53 lakh tonnes and a productivity of 479 kg/hectare. Bijapur with an area of 1.04 lakh hectares, with production of 31,050 tonnes with a productivity of 314 kg per hectares stands second, while Bidar having an area of 67000 hectares and production of 49,647 tonnes with an average productivity of 780 kg per hectare holds third position.

Improvement in agriculture is possible with the adoption of new and modern farming agro-techniques. Which new agriculture techniques are disseminating through extension methods. Extension methods like demonstration, training, field days, group meeting, krishimela and field visit etc., are some of the major weapons for introducing the findings of modern research in agricultural practices to increase agricultural production in particular on sustainable income of the rural masses in general.

Demonstration is one of the best methods to disseminate the new technology. These methods are used as tools by the extension worker to effect desirable changes in the behavior of rural masses, arrange the best learning situations, and provide opportunities in which useful communication and interaction take place between extension workers and farmers. The purpose of using demonstration method is to prove that new practice is superior to the one

being used currently, to convince and motivate extension clientele to try a new practice, and to set up long-term teaching-learning situation. Hence demonstration is a useful method to introduce a new technology and practice for a large group of interested people with the background of 'seeing is believing' in effectively transferring improved technology, know-how and do-how to the farmers.

There are two types of demonstration viz. result demonstration and method demonstration. Result demonstration is an educational test to prove the advantages of recommended practices and to demonstrate their applicability to the local condition. It is conducted by a farmer under the direct supervision of an extension worker. Method demonstration is used to show the techniques of doing things or carrying out new practices. Result demonstration is one of the most powerful extension teaching methods particularly useful for those farmers who are illiterate and believe in seeing. The result demonstration teaches farmers why a new practices or input should be adopted by comparing it with a commonly used local practice. This technique is often used in such situations where farmers are not ready to believe and accept what is being said by the extension worker. The purpose of using the result demonstration is to prove that the new practice is superior to the one currently being used, to persuade extension clientele to try the new practice. A successful demonstration can produce positive results for extension workers and developing confidence in them. It is a teaching method, which extension workers who are new to an area, might want to use to establish their credibility in the community.

Recent technological intervention of transplanting method of redgram cultivation is one of the alternate agronomic practices to overcome late sowing and related lower yields of redgram. In addition to advantages of low pest and disease occurance and higher marginal returns. This technique involves rising of seedlings in polythene bags in the nursery for one month and transplanting the seedlings with the onset of monsoon after the soil profile is uniformly wet.

This method uses lesser seed, chemical inputs and promotes soil biotic activities in and around plant roots, enhanced through liberal applications of compost and harrowing that aerates the soil. Further transplanting at wider spacing allows enough sunlight to reach the leaves of each redgram plant thus reducing competition for water, space and nutrients resulting in the spread of roots and healthy growth of plants. These changed practices with lower inputs counter-intuitively lead to improved productivity and yield. Now it is cultivated mainly in Bidar and Gulbarga districts in the days to come it may occupy larger redgram

cultivated area in the state especially in northern parts of Karnataka. During 2010-11, about 4360 hectares of area was under transplanted Redgram (KVK, Bidar). It is one of the recently adopted techniques in the study region and gaining importance in redgram farming community and it improves production and productivity. Hence the present study is proposed to know the different dimensions of redgram cultivation in the changed scenario with the following specific objectives.

Objectives of investigation

1. To study the personal, socio-economic and psychological characteristics of respondents
2. To study the knowledge and adoption level of respondents regarding demonstration on transplanting method of redgram cultivation
3. To find out the relationship between selected independent variables by the respondents with their knowledge and adoption level
4. To elicit the constraints in adoption of transplanting method of redgram cultivation

Scope of the study

As discussed earlier in the context of assessing the impact of demonstrations, it is necessary to assess how far these demonstrations have created impact on knowledge gained in respect of transplanting method of redgram cultivation practices and the level of adoption of the transplanting method of redgram cultivation practices of demonstration and non-demonstration farmers. Further, it is also to know the relationship between personal and socio-psychological characteristics of farmers and their change in knowledge and adoption. There is also need to know the radiation effect that is how far these demonstrations have created impact on other farmers. The study is also aimed to identify the constraints faced by farmers in adoption of transplanting method of redgram cultivation practices.

Limitations of the Study:

This study was of ex-post facto nature and has its own limitation as the cause and effects already occurred before conducting study. Therefore, in depth study of this nature is very much required to analyze the bottlenecks of this research study. The research has its own limitation, as it is only part of M.Sc. programme and the researcher cannot devote full time to undertake in depth study. Therefore, it has its own limitation as a time constraint. The locale of the study was only limited to three taluk where transplanting method of redgram

cultivation was grown as a pure crop in large areas and the results cannot be generalized for the entire state.

Most of the data collected was based on the expressed opinion of the respondents. Therefore, the study may not be free from usual bias, which is involved with the respondents in social investigations.

Review of Literature

II. REVIEW OF LITERATURE

A brief review of literature is an integral part of any investigation as it not only gives an idea on the work done in the past, but also provides the basis for interpretation and discussion of the findings. The present study was designed to know the impact analysis of demonstration on transplanting method of redgram cultivation practices by the farmers. Considerable efforts are made to review the available literature having direct or indirect bearing on present study. For the sake of convenience, the available related reviews are presented under the following headings.

2.1 Knowledge level of the respondents

2.2 Adoption level of the respondents

2.3 Personal, socio-economic and psychological characteristics of the respondents

2.4 Relationship between selected independent variables of the respondents with their knowledge and adoption level

2.5 Constraints faced by the farmers in the adoption of transplanting method of redgram cultivation practices

2.6 Cost and returns of transplanting method of redgram production

2.1 Knowledge level of respondents

Radhakrishna Murthy (1969) while studying the impact of National Demonstration programme conducted in Andhra Pradesh revealed that, majority of the farmers were aware of national Demonstrations, over 42 per cent had knowledge about the crops grown during National Demonstration plots, About 50 per cent of them knew the demonstrators and only 12 per cent of farmers had knowledge about the purpose of National demonstration.

Pathak *et.al.,* (1979) indicated that the difference in the level of knowledge between the participant of National demonstration and Non-participants in relation to the improved practices of Jute and Wheat crops was highly significant, but in the case of rice cultivation it was not significant.

Channabasiah (1981) reported that there was significant difference between participant and non-participant farmers of Redgram demonstrations regarding knowledge about improved practices of Redgram cultivation.

Kamarudeen (1981) conducted a study on the impact of National Demonstration programme on paddy cultivation in Trichur district and revealed that, the neighbouring farmers of the demonstrated plots were superior to the control farmers in respect to their level of knowledge about the demonstrated practices.

Hirevenkanagoudar, L.V., (1984) revealed that, the participant farmers of the National demonstrations had significantly higher knowledge about the demonstrated practices when compared to the non-participant farmers.

Nikam and Singh (1984) found that, the level of knowledge about improved agricultural practices of the tribal farmers who participated in the National demonstrations in Dholia district of Maharashtra was superior to that of the non-participant farmers.

Ranganatha (1990) revealed that, there was highly significant difference between participant and non-participant farmers in a demonstration about the overall knowledge of recommended practices of Groundnut cultivation.

Subramaniam (1992) revealed that, the differences in knowledge level of participant and non-participant farmers in a demonstration were significant.

Budihal *et al.*, (1994) noted that after the training, increase in knowledge level was seen to the tune of 64.00 per cent in grafting, 53.00 per cent in budding and 38.00 per cent in layering techniques. Further, it was interesting to note that need based skill oriented training had enhanced the knowledge level and resulted in increase in adoption level.

Ingle (1997) observed that 90.00 per cent of the trained farmers of KVK knew soil type required for summer groundnut. As regards sowing time, about 95.00 per cent of trained farmers were acclimatized. Whereas, 96.66 per cent of the trained farmers were knowing about seed rate. About seed treatment with fungicides 55.66 per cent, trained farmers knew. Fifty per cent of the trained farmers knew the rhizobium culture treatment. Regarding the fertilizer dose, 75.00 per cent of trained farmers knew the recommended dose.

Sharma *et al.,* (1997) revealed that majority of the trained (72.50%) and untrained farmers (64.77 %) of KVK were found in medium level of knowledge regarding maize production technology.

Veeraiah *et al*., (1998) revealed that majority of the trained farmers of KVK had medium level of knowledge (61.33 %) about recommended critical skills in rainfed groundnut cultivation, followed by low level of knowledge (20.00 %) and high level of knowledge (18.67 %).

Sharma and Sharma (1999) found that majority of adopted farmers had extremely high knowledge regarding extension programmes carried out by KVK. Non-adopted farmers had medium to high knowledge regarding extension programmes carried out by KVK at Churu district of Rajasthan.

Ahmed and Philip (1999) inferred that most of the trainees in all the four subject matter *viz.,* kitchen gardening (55.50 %) mushroom cultivation (42.50 *per cent*), layer farming (52.56 %) and fresh water pisciculture (52.50 %) showed medium level of knowledge gain after undergoing the training in the respective field.

Gogoi *et al.,* (2000) reported that the level of knowledge of the trained framers on recommended practices of rice was significantly higher than non-trained farmers.

Satyanarayana and Punna Rao (2000) conducted a study in West Godavari district of Andhra Pradesh on knowledge of oil palm growers revealed that about 60.00 per cent of the oil palm growers possessed medium knowledge while 28.00 per cent and 12.00 per cent had high and low knowledge about the recommended technology, respectively.

Raghunandan (2004) reported that about 17.50 per cent of respondents had the complete knowledge of contour cultivation purpose. Majority of respondents possessed the knowledge of reduces soil erosion and conserves soil moisture (62.50%), followed by reduced cost of cultivation (50.00%) and directly improves soil fertility (26.25%).

Rathod (2005) was observed that, majority (60.83%) of the respondents were found to belong to medium level of knowledge category. One fourth (25.84%) of the respondents had fallen in high knowledge category followed and 13.33 per cent of the respondents in to category.

Kharatmol (2006) revealed that 53.33 and 18.33 per cent of trained and untrained respondents belonged to medium knowledge level category while 25.00 per cent (trained) and 18.33 per cent (untrained) of the respondents belonged to high knowledge level whereas 21.66 per cent and 43.33 per cent of the trained and untrained respondents had low knowledge level respectively.

Binkadakatti (2008) in his study stated that 38.75 per cent of trained and 17.50 per cent of untrained farmers were belonged to high overall knowledge level category, while, 36.25 per cent of trained and 35.00 per cent of untrained respondents were belonged to medium overall knowledge level category. Whereas, 25.00 per cent trained and 47.50 per cent of untrained respondents were belonged to low knowledge level category.

Sidram (2008) conducted a study on analysis of organic farming practices in pigeonpea in Gulbarga district of Karnataka state and found that majority of the respondents (63.33%) belonged to the medium knowledge level category, while 23.33 and 13.33 per cent of the respondents belonged to high and low adoption categories, respectively.

Sureshkumar (2009) study on technological gap in recommended soybean cultivation practices by the soybean growers and found that majority of the respondents (70.66%) belonged to the medium knowledge level category, while 18.00 per cent and 11.34 per cent of the respondents belonged to high and low adoption categories, respectively.

Raghavendra (2010) conducted a study on an impact front line demonstration of sunflower farmers knowledge and adoption- A study in Bijapur district of Karnataka found that among Demonstration farmers 30.00 per cent belong to high level knowledge category, 55 per cent belong to medium knowledge category and 15.00 per cent of farmers belong to low knowledge category. While, among other farmers, 16.67 per cent belong to high knowledge category, 36.66% belong to medium knowledge category and 46.67 per cent belong to low knowledge category.

2.2 Adoption of recommended practices respondents

Rao (1971) revealed that, there was significant difference in the extent of adoption of improved practices between the farmers of the demonstration village and adjacent villages. It was found that majority of the farmer demonstrators had exhibited medium level of adoption, where as the non-participant farmers clustered under low level of adoption.

Sing and Singh (1974) found that, the percentage of adopters was more in the National demonstration villages than in the control villages and the difference in the mean adoption scores of the two categories was significant.

Oliver *et al.,* (1975) reported that, 64 per cent of the farmers who participated in the cultural operations in the demonstration plots had adopted one or/more of the practices recommended for the crop.

Behera and Sahoo (1975) revealed that, out of the 118 farmers interviewed, only 5 had adopted the demonstrated practices fully, while 32 had partially adopted the demonstrated practices.

Pathak *et al.,* (1979) reported that, the difference in the adoption levels was significant between farmer demonstrators and neighbouring farmers in relation to improved practices of Jute, Paddy and Wheat crops.

Kamarudeen (1981) found that, the neighbouring farmers of the National demonstration plots were superior to other farmers in relation to their extent of adoption of the recommended practices of paddy.

Kibey *et al.,* (1984) reported that, National demonstrations were very successful and effective in communicating improved agricultural technologies to tribal farmers and also in increasing their adoption of improved technologies.

Nikam and Singh (1984) found that, adoption level of tribal farmers who participated in National demonstrations were superior to that of the non-participant tribal farmers.

Subramaniam (1992) revealed that, the difference between participant and non-participant farmers with respect to adoption of improved practices in Sunflower crop was significant.

Meti and Hanchinal (1994) conducted a study on the adoption pattern of the cultivation practices of sunflower crop among the farmers in Raichur district of Karnataka found that 42.00 per cent of farmers were using private agency seeds and recommended varieties, 43.33 per cent had used higher seed rate while equal per cent of (18.00%) of farmers used recommended quantity and less than recommended quantity, majority of farmers (66.66%) apply less than recommended quantity of FYM and 66.66 per cent had applied more than recommended chemical concentration.

Ankulwar *et al.* (2001) conducted a study in Lathur district of Maharashtra state on sunflower farmers and noticed that 61.33 per cent respondents did not adopt the irrigation schedule, while 24.67 per cent respondents adopted irrigation schedule completely and 14.00 per cent of them adopted partially. About 50.67 per cent respondents adopted recommended plant protection measures partially while 40.00 per cent adopted it fully and 9.33 per cent respondents did not adopt plant protection measures.

Nagaraj and Katteppa (2002) in their study on adoption of improved cultivation practices of groundnut by farmers of Tumkur and Chitradurga districts of Karnataka state observed that 38.60 per cent of big farmers belonged to medium adoption category. In contrast to this a similar percentage (37.50%) of small farmers belonged to low level adoption category and more number of farmers (36.90%) belonged to medium level of adoption.

Rathod (2005) in his study indicates the categorization of respondents in to three levels of adoption namely, low, medium and high, based on the criteria of mean and standard deviation, majority (55.83%) of the respondents were found in the medium level of adoption category followed by high (26.66%) and 17.51 per cent of the respondents fallen under low category.

Kharatmol (2006) in his study revealed that 45.00 per cent of trained respondents belonged to high adoption level category while 40.00 per cent trained respondents belonged to medium adoption level whereas 15.00 per cent of the trained respondents had low adoption level.

Binkadakatti (2008) revealed that, 47.50 per cent of trained and 12.50 per cent of untrained respondents were belonged to medium adoption level category. While, one third of (33.75%) trained and 5.00 per cent of untrained respondents were belonged to high adoption level category. Whereas, 18.75 per cent of the trained and 82.50 per cent of untrained respondents had low adoption level category.

Sidram (2008) in his study indicated that 69.17 per cent of respondents belonged to medium adoption category with mean score of 33.4 and with mean yield of 3.86 q/acre. While, 20.00 and 10.83 per cent of respondents belonged to high and low adoption category with mean scores 37.31 and 29.05 and mean yield of 4.29 q/acre and 3.34 q/acre, respectively.

Raghavendra (2010) in his study evident that majority of Demonstration framers belong to high and medium adoption category (48.33 per cent and 38.33 per cent

respectively). Only 13.33 per cent of farmers belong to low adoption category. While, among other farmers majority of them belong to low and medium adoption category (40 per cent and 38.33 per cent respectively). About 21.66 per cent of farmers belong to high adoption category.

2.3 Personal, socio-economic and psychological, characteristics of the respondents

2.3.1 Age

Kamble (1998) conducted a study on impact of Krishi Vigyan Kendra training on participant rural women found that, majority of the respondents who participated in the KVK training programmes were of young age (80.00 %), followed by middle age (18.33 %) and only 1.66 per cent respondents were in old age group.

Patil (2000) conducted a study on adoption of banana production technology under drip irrigation observed that, majority of the banana growers (58.33 %) were from middle age group followed by young age (24.17 %) and old age group (17.50 %).

Karpagam (2000) conducted a study in Erode district of Tamil Nadu state and indicated that; majority (70.83%) of the turmeric growing farmers belonged to middle aged group.

Babanna (2001) conducted a study on arecanut growers in Shimoga district and stated that 38.40 per cent of growers belonged to old age, 35 per cent of them were middle aged and 26.66 per cent of the growers were young.

Wase (2001) conducted a study on knowledge and adoption of farmers about Jayanti chilli cultivation observed that, majority of chilli growers (52.50 %) were in the age group of 36 to 50 years that is middle age category.

Raghunandan (2004) in his study on knowledge and adoption level of soil and water conservation practices by farmers in northern Karnataka reported that 45.00 per cent of the respondents (45.33%) belonged to the middle age group, followed by old age (36.25%) and young age group (18.75%), respectively.

2.3.2 Education

Channal (1995) in a study on share holders and non-share holders of sugarcane growers in Belgaum district reported that 43.00 per cent of the share holders were under the

category of primary and middle school followed by high school and PUC (36.00%), illiterate (17.00%) and graduate (4.00%), while in case of non-share holders 40.00 per cent had studied up to primary and middle school followed by high school and PUC (38.00%), graduates (12.00%) and illiterate (10.00%).

Sunil Kumar (2004) revealed that, in respect of formal education obtained, 14.16 per cent were illiterate, 15.75 per cent of the respondents had received education up to middle age school, whereas, 22.50 per cent of them received education up to high school, while the other 10.80 and 10.00 per cent of the respondents received education up to PUC and graduation level respectively.

Patil (2005) investigated knowledge, extent of participation and benefits derived by participant farmers of the watershed development programme in Raichur district and reported that nearly 30.00 per cent of the respondents had education up to high school, followed by middle school (28.00%) and primary school (27.33%). Nearly 12.00 per cent of them were illiterates, while a meager 4.00 per cent of them had education up to college and degree programme.

Kharatmol (2006) in his study stated that, 30.00 per cent of trained and 15.00 per cent of untrained respondents were educated up to college, followed by high school (31.66% and 26.66 %), middle school (15.00% and 13.33%) and illiterates (10.00% and 11.67%) primary school (6.66% and 28.33%). Whereas, 6.66 and 5.00 per cent the trained and untrained respondents were graduates.

Binkadakatti (2008) in his study revealed that, 30.00 per cent of the trained and 36.25 per cent of the untrained respondents were educated up to middle school, followed by high school (20.0% and 10.00%), primary school (22.50% and 21.25%), college (12.50 and 12.50%) and illiterates (10% and 5%). whereas, 5 per cent each trained and untrained farmers were graduates.

Raghavendra (2010) in his study stated that 41.67 per cent of demonstration farmers and 63.33 per cent of other farmers were illiterates. Whereas, 25.00 and 21.67 per cent of demonstration farmers and 13.33 and 10.00 per cent of other farmers had education up to primary school and high school, respectively. And very negligible number of demonstration and other farmers (1.67 %) had education up to college level.

2.3.3 Farming Experience

Chandregowda (1997) in his study on chrysanthemum in eastern dry zone of Karnataka reported that, majority of the farmers had low farming experience (48.33%) followed by medium (34.67%) and high (17.00%) farming experience respectively.

Natikar (2001) in his study found that majority of the respondents had medium farming experience (48%) followed by high (45%) and low (7%) farming experience, respectively.

Nagaraj (2002) in his study revealed that, a large majority of the respondents had four to eight years of experience in sugarcane cultivation as indicated by 85.41 per cent of the respondents, whereas, 13.85 per cent of the respondents mentioned 9 to 12 years as their sugarcane farming experience. Negligible per cent (0.83%) had the experience of more than 12 years in the sugarcane cultivation practices.

Vinay Kumar (2005) in his study reported that, 53.33 per cent of the respondents belonged to low experience category followed by medium (45.00%) and high (1.67%) farming experience.

Binkadakatti (2008) in his study revealed from the data that, 72.50 per cent of trained and 70.00 per cent of untrained farmers were belonged to medium experience category, followed by low experience (10.00% and 16.25%) and high experience category (17.50% and 13.75%).

Sidram (2008) revealed about the experience of farmers in farming and experience in organic pigeonpea cultivation. Nearly one third farmers (30.83%) had high experience in farming where as majority (69.17%) had low experience. In case of organic farming experience, majority (82.50%) of the respondents had low experience, while only 17.50 per cent of the respondents had high experience in organic pigeonpea cultivation.

2.3.4 Land holding

Hanumanaikar (1995) in a study on sunflower growers reported that, 70 per cent of respondents were big farmers. Whereas, 17.50 and 12.50 per cent were medium and small farmers, respectively.

Saravanakumar (1996) in his study in Krishnagiri taluka of Dharmapuri district in Tamil Nadu observed that, majority of the mango growers (64.18%) had medium land holding while 21.66 per cent and 14.66 per cent had small and big land holdings, respectively.

Shashidhara (2004) in his study on influencing factors and constraints in drip irrigation of horticulture farmers of Bijapur district revealed that, majority (34.99%) of the respondents belonged to big land holders category followed by medium category (29.99%) and semi medium category (21.68%), whereas only 13.33 per cent of them belonged to small farmers category.

Kharatmol (2006) in his study revealed that 26.67 per cent of trained respondents and 15.00 per cent of untrained respondents belonged to medium category, followed by marginal category (21.67% and 25.00%) semi medium category (20.00% and 28.33 % untrained), large farmer category 18.33 per cent trained and 13.33 per cent untrained and small farmers category (13.33 % and 18.33%) respectively.

Nagadev and Venkataramaiah (2007) based on their study reported that 39.33 per cent of respondents fall under semi medium category, 20.00 per cent had medium land holding while 26.67 per cent possessed small land holding and marginal of 12.00 per cent, only meager number (2.00%) had large land holding.

Binkadakatti (2008) in his study revealed that, 61.25 per cent of trained farmers and 53.75 per cent of untrained farmers are were belonged to medium farmers category, followed by semi medium farmers (22.50% and 35.00%), big farmers (13.75% and 10.00%) and small farmers (2.50% and 1.25%), category. Whereas, none of the framer was belonged to marginal farmer category.

Sidram (2008) carried out a study on analysis of organic farming practices in Pigeon pea in Gulbarga district of Karnataka state and reported that majority (60.83%) of the respondents belonged to big land holders category followed by 23.33 and 15.83 per cent of the respondents belonged to medium and small land holders categories, respectively.

2.3.5 Annual income

Angadi (1999) conducted a study on knowledge, adoption and marketing pattern of Pomegranate growers in Bagalkot district and reported that majority (65%) of the pomegranate farmers belonged to medium level income (Rs. 99,000-257000) followed by

27.50 per cent and 7.50 per cent fell under low (<99000 Rs.) and high (Rs. 257000 and above) annual income, categories.

Babanna (2001) carried out a study on information source consultancy and training needs of farmers in Arecanut cultivation under Tungabhadra command area in Shimoga district and revealed that 61.66 per cent of the respondents belonged to medium income category while 23.40 and 15.00 per cent were under low and high income categories, respectively.

Suresh (2004) in his study Entrepreneurial behavior of milk producers in Chittoor district of Andhra Pradesh reported that, majority of milk producers were in medium income group (80.33%) followed by high and low income groups i.e., 15.00 per cent and 4.17 per cent, respectively.

Prabhu (2006) in his study on management orientation and economic performance of Chrysanthemum growers in northern Karnataka observed that more than half (54.16%) of the respondents belonged to low income category (Rs<40,000) whereas 30.00 and 15.84 per cent of the respondents belonged to high (Rs> 60,000) and medium (Rs 40,000 – 60,000) income categories, respectively.

Nayak (2007) conducted a study on management practices of Pineapple growers in Karnataka and reported that 46.24 per cent of the respondents belonged to high annual income followed by medium (25.63%), semi medium (17.50%) and (10.63%) low annual income categories.

Binkadakatti (2008) in his study indicated that, 45.00 per cent of trained and 41.25 per cent of untrained respondents were belonged to semi medium income category, followed by low income (32.50% and 33.75%) and medium income category (13.75% and 18.75%). Whereas, 8.75 per cent of trained farmers and 6.25 per cent of untrained farmers were belonged to high-income categories.

Raghavendra (2010) in his study stated that 43.33 per cent of demonstration farmers belongs to medium annual income level category followed by low and high (31.67 and 25.00 per cent) respectively. Whereas, 46.67, 31.67 and 21.67 per cent of non-demonstration farmers belongs to low, medium and high annual income category, respectively.

2.3.6 Innovativeness

Vijay Kumar (2001) indicated that 47.50 per cent of respondents fell in low category followed by 31.66 per cent in medium category and 20.84 per cent in high category.

Bhagyalaxmi *et al.* (2003) observed that majority (69.44%) of the respondents had medium innovativeness followed by 15.56 and15.00 percent of respondents having high and low innovativeness, respectively.

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

Nagesh (2005) observed that majority (63.33%) of the respondents had medium innovativeness followed by 18.33 per cent respondents each having high and low innovativeness in the vegetable seed production.

Kharatmol (2006) in his study indicated that 38.33 per cent 26.67 per cent of trained and untrained respondents belonged to high innovativeness category followed by medium (36.66%) and 23.33%) and low (25.00% and 50.00%) innovativeness categories, respectively.

Sidram (2008) in his study revealed that nearly half (45.00%) of respondents had medium innovativeness with mean score of 12.17, while, 32.50 and 22.50 per cent of respondents had low and high innovativeness with mean score of 10.71 and 16.05, respectively.

2.3.7 Risk orientation

Vijaykumar (2001) conducted a study on entrepreneurial behavior of floriculture farmers in Ranga Reddy district of Andhra Pradesh and indicated that majority (33.34%) of the respondents fell under low risk taking ability, followed by 35 per cent and 26.66 per cent of them were in the categories of medium and high level of risk taking ability, respectively.

Chandramouli (2005) in his study on entrepreneurial behaviour of farmers in Raichur district of Karnataka revealed that 40.83 per cent of the respondents had low risk taking ability, followed by high (35.00%) and medium (24.17%) risk taking ability, respectively.

Nagesh (2005) conducted a study on entrepreneurial behaviour of vegetable seed producing farmers of Haveri district and revealed that 56.7 per cent of the respondents had medium risk orientation followed by 22.5 and 20.8 per cent of the respondents having low and high risk orientation, respectively.

Maraddi (2006) carried out an analysis of sustainable cultivation practices followed by Sugarcane growers in Karnataka and observed that high level of risk orientation was noticed in 18.89 per cent of the Sugarcane growers, whereas medium level of risk orientation was possessed by 48.89 per cent and remaining 32.22 per cent of growers had low risk orientation.

Kharatmol (2006) in his study revealed that more than one third of the trained respondents (43.33%) and 41.66 per cent of untrained respondents belonged to medium risk orientation category, whereas 28.33 per cent of trained and 26.33 per cent of untrained respondents belonged to high level of risk orientation category respectively while, 28.33 per cent of trained and 31.67 per cent of untrained respondents belonged to low level of risk orientation categories.

Sushma (2007) in her study on analysis of entrepreneurship development in women through EDP trainings revealed that majority of the trained women entrepreneurs (61.55%) had medium level of risk bearing ability while 10.76 per cent and 27.69 per cent of them had high and low level of risk taking ability, respectively.

Binkadakatti (2008) revealed that, nearly half of the trained respondents (47.50%) and nearly one third of the untrained respondents (43.75%) were belonged to medium risk orientation category, whereas, 28.75 per cent of trained and 18.75 per cent of untrained respondents were belonged to high level of risk orientation category. while, 23.75 per cent of trained and 37.50 per cent of untrained respondents were belonged to low level of risk orientation category.

Sidram (2008) in his study nearly half (46.67 per cent) of the respondents had low risk orientation with mean score of 2.06. While, 29.17 and 24.17 per cent of respondents had medium and high risk orientation with mean scores of 3.85 and 4.83 respectively.

2.3.8 Achievement motivation

Palaniswami and Sriram (2001) observed in their study on modernization characteristics of sugarcane growers that, 72.11 per cent of respondents belonged to medium level of achievement motivation category, while 14.28 and 13.61 per cent of respondents belonged to high and low level of achievement motivation category, respectively.

Nagesh (2005) in his study on study on Entrepreneurial behaviour of Vegetable seed producing Farmers of Haveri district revealed that 71.66 per cent of vegetable seed production

farmers had medium achievement motivation followed by more or less equal percentage of respondents in low (15.00%) and high (13.33%) achievement motivation, respectively.

Ravi (2007) conducted study on entrepreneurial behavioural characteristics of SC and ST farmers of Gulbarga district and reported that 30.00 per cent of the farmers belonged to high achievement motivation category followed by low (32.50%) and medium (37.50%) achievement motivation categories.

Binkadakatti (2008) revealed that, 40.00 per cent of trained and 36.25 per cent of untrained respondents were belonged to medium achievement motivation category, whereas, 33.75 per cent of trained and 18.75 per cent of untrained respondents were belonged to high achievement motivation category, followed by 26.25 per cent of trained and 45.00 per cent of untrained respondents were belonged to low achievement motivation category.

Sidram (2008) in his found that 46.67 per cent of respondents were in medium achievement motivation category with mean score of 7.02, followed by 36.67 and 16.67 per cent of respondents in low and high achievement motivation category with mean score of 4.84 and 10.11, respectively

Raghavendra (2010) in his study about 50 per cent of demonstration farmers belong to medium level of achievement motivation, where as only 30.00 and 20.00 per cent of respondents, while, 53.33, 28.33 and 18.33 per cent of the Non-demonstration farmers belonging to low, medium and high achievement motivation category, respectively.

2.3.9 Scientific orientation

Palaniswamy and Sriram (2001) observed in their study on modernization characteristics of sugarcane growers that, 70.75 per cent of respondents belonged to medium level of scientific orientation category. Whereas, 17.01 and 12.24 per cent of respondents belonged to high and low level of scientific orientation category, respectively.

Nagaraj (2002) in his study stated that, majority (67.08%) of the respondents had medium level of scientific orientation respect of improved package of agril. practices. the high level scientific orientation was seen in 22.08 per cent of the respondents. Whereas, only 10.83 per cent of the respondents had low level of scientific orientation.

Kharatmol (2006) in his study observed that nearly an equal per cent (43.33%) of the trained and untrained respondents were found in medium scientific orientation category. While, 35.00 per cent of trained and 28.33 per cent of untrained respondents belonged to high scientific orientation category. Whereas 21.67 per cent and 28.33 per cent of the trained and untrained respondents were found in low scientific orientation.

Sidram (2008) in his study found that majority (69.17%) of the respondents belonged to medium scientific orientation category, while only 16.67 and 14.17 per cent respondents belonged to high and low scientific orientation category.

Raghavendra (2010) in his study found that majority (40.00%) of demonstration farmers belonged to medium scientific orientation category, while 31.67 and 28.33 per cent respondents belonged to low and high scientific orientation category, respectively. But 58.33, 35.00 and 6.67 per cent of other farmers belongs to low, medium and high scientific orientation category, respectively.

2.3.10 Mass media utilization

Thangavel *et al.* (1996) revealed that 60.00 and 52.00 per cent of the respondents had low level of mass media exposure in wet and dry areas, respectively, 28.00 and 34.00 per cent of both wet and dry areas had high level of mass media exposures.

Raghavendra (1997) in his study on knowledge and adoption behaviour of arecanut farmers of South Canara district, Karnataka state reported that 48 per cent of the growers were in the category of high mass media use, followed by 39 per cent of growers under low mass media use, remaining 13 per cent of the growers were in medium category.

Krishnamurthy *et al.*, (1998) found that mass media participation was relatively higher (83%) in case of adopters as compared to the non-adopters of weedicides in paddy.

Dhamodharan and Vasanthkumar (2001) noticed that above half (53.33%) of the respondents had medium level of mass media expressed followed by 40.00 per cent of the respondents with high level of mass media exposure.

Shashidhara (2003) in his study reported that 41.11 per cent of the respondents belonged to medium level mass media participation followed by low level (35.56%) of mass media participation, whereas 23.33 per cent of respondents were noticed high mass media participation.

Suresh (2004) in his study entrepreneurial behaviour of milk producers in Chittoor district of Andhra Pradesh reported that, 64.17 per cent of respondents were exposed to mass media to a moderate extent followed by 21.25 per cent to low extent and 14.58 per cent to high extent.

Kharatmol (2006) in his study revealed that 36.66 per cent of the trained respondents belonged to high mass media participation category. While, an equal per cent (31.66%) of farmers belonged to high and low mass media participation categories. Whereas, 38.33, 33.33 and 28.33 per cent of untrained respondents were found to be in high, low and medium mass media participation category respectively.

2.3.11 Extension participation

Saravanakumar (1996) conducted a study on mango growers in Krishnagiri taluka of Dharmapuri district in Tamil Nadu and observed that, majority of the respondents never participated in various extension activities namely demonstration (83.34%), training programmes (70.83%) and discussion meeting (67.50%). About (68.33 %) and (54.17%) of the mango growers participated occasionally in 'field day' and 'tour', respectively.

Yaligar (1997) reported that 34.42 per cent of soybean growers had participated in one or more extensions activities. Further, among the participated respondents, 35.29 per cent had attended demonstrations followed by training programme (24.49%), krishimela (23.24%) and meetings (15.68%).

Angadi (1999) conducted a study on knowledge, adoption and marketing pattern of Pomegranate growers in Bagalkot district and revealed that majority of the respondents had not participated in various extension activities namely, discussion with extension personnel (98.76%), group meetings (75.23%) and training programmes (72.50%). Whereas 43.75 and 38.13 per cent of the respondents participated regularly in extension activities like method demonstration and krishimela, respectively.

Kanavi (2000) conducted a study on the knowledge and adoption behaviour of sugarcane growers in Belgaum district of Karnataka reported that, none of the respondents participated regularly in training and demonstrations. Nearly one third (31.33%) of respondents participated in Krishimela. Whereas, very less number of respondents participated in extension activities like farm visits (1.33%), group discussion (2.66%) and study tour (4.00%), whereas, 20 per cent participated occasionally in Krishimela followed by training (4.66%), group discussion (4.00%), demonstration and farm visits (2.00%) each and study tour (0. 66%).

Shashidhara (2003) conducted a study on drip irrigation farmers of Bijapur district and revealed that, 45.83 per cent of the respondents participated in group meetings followed by exhibition (41.66 per cent) and 18.33 per cent of the respondents participated in Krishimela.

Raghavendra (2004) conducted a study on knowledge and adoption level of post harvest technology by red gram cultivators in Gulbarga district and found that, 24.66 per cent of the respondents were participated regularly in agricultural exhibitions, demonstrations (22.67%) conducted in their villages.

Sunil Kumar (2004) in his study in Belgaum district of Karnataka revealed that, nearly 23.00 per cent of respondents participated regularly in agricultural exhibition followed by 20.83 per cent in demonstrations. Majority of them never attended in activities like training (66.67%), educational tour (94.17%) and field visits (92.05%).

2.3.12 Sources of information

Raghavendra (1997) in a study on knowledge and adoption behaviour of arecanut farmers of South Canara district, Karnataka state, revealed that 50 per cent of the arecanut growers consulted progressive farmers for cultivation practices of arecanut followed by mass media sources 25 per cent and institutional sources 20 per cent.

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

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

Kumar (1998) in his study on knowledge, adoption and economic performances of banana growers, reveal that a major proportion 50 per cent of the banana growers had consulted neighbours and friends to get information regarding banana cultivation.

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

2.4 Relationship between selected independent variables and their knowledge and adoption of transplanting method of redgram cultivation practices

2.4.1 Relationship between selected independent variable with their knowledge

Independent variable	Year	Respondents	Nature of relationship
Age			
Kanavi	2000	Sugarcane growers	Non-Significant
Rathod	2005	Sugarcane growers	Non-Significant
Binkadakatti	2008	Biofertilizer farmers	Non-significant
Education			
Karpagam	2000	Turmeric growers	Significant
Veda Murthy	2002	Arecanut growers	Significant
Kavaskar and Govind	2006	Banana growers	Significant
Thippeswamy	2007	Coconut growers	Significant
Hinge	2009	Wine grape growers	Significant
Farming experience			
Bhatol	1989	Paddy growers	Significant
Tawde	1994	Paddy growers	Significant
Maraddi	2006	Sugarcane growers	Significant
Land holding			
Krishnamurthy	1999	Rice growers	Significant
Kharatmol	2006	Vermicompost	Significant
Binkadakatti	2008	Biofertilizer farmers	Significant
Annual income			
Kharatmol	2006	Vermicompost	Non-significant
Binkadakatti	2008	Biofertilizer farmers	Non-significant
Innovativeness			
Rathod	2005	Sugarcane growers	Significant
Kharatmol	2006	Vermicompost	Significant
Raghavendra	2010	Sunflower farmers	Significant
Risk orientation			
Birajdar	1999	Grape growers	Significant

Kavaskar and Govind	2006	Banana growers	Significant
Maraddi	2006	Sugarcane growers	Significant
Hinge	2009	Wine grape growers	Significant
Achievement motivation			
Chandregowda and Jayaramaiah	1996	Paddy farmers	Significant
Reshmy	1998	Big and small farmers	Significant
Binkadakatti	2008	Biofertilizer farmers	Significant
Scientific orientation			
Ranganath	1997	Rice farmers	Significant
Anasuya	1997	Cotton farmers	Significant
Reshmy	1998	Banana growers	Significant
Mass media utilization			
Siddaraju	1992	Grape growers	Significant
Birajdar	1999	Grape growers	Significant
Kharatmol	2006	Vermicompost	Significant
Thippeswamy	2007	Coconut growers	Significant
Hinge	2009	Wine grape growers	Significant
Extension participation			
Kalasriya *et al.*	1997	Cotton growers	Significant
Meti	1998	Cotton growers	Significant
Kanavi	2000	Sugarcane growers	Significant
Rathod	2005	Sugarcane growers	Significant
Kharatmol	2006	Vermicompost	Significant
Source of Information			
Sharanappa	2011	Paddy farmers	Significant
Manjunatha	2011	Cotton farmers	Significant

Above reviews give an insight those variables like education, land holding, farming experience, mass media participation, extension participation, sources of information, innovativeness, risk orientation, achievement motivation and scientific orientation were having significant relationship with knowledge level of the respondents. While age and annual income were non-significant relationship with knowledge level.

2.4.2 Relationship between selected independent variable with their adoption

Independent variable	Year	Respondents	Nature of relationship
Age			
Rathod	2005	Sugarcane growers	Non-Significant
Kharatmol	2006	Vermicompost	Non-Significant
Binkadakatti	2008	Biofertilizer farmers	Non-Significant
Education			
Venkatesh Prasad *et al.*	1999	Paddy farmers	Significant
Kanavi	2000	Sugarcane growers	Significant
Kalaskar *et al.*	2001	Cotton growers	Significant
Rathod	2005	Sugarcane growers	Significant
Rai and Singh	2010	Cotton growers	Significant
Farming experience			
Chandregowda and Jayaramaiah	1996	Paddy growers	Significant
Karthikeyan *et al.*	1996	Sugarcane growers	Significant
Shinde *et al.*	2000	Farmers	Significant
Binkadakatti	2008	Biofertilizer farmers	Non-Significant
Land holding			
Shivakumar	1997	Rice farmers	Significant
Krishnamurthy	1999	Rice farmers	Significant
Ranganatha	1997	Paddy growers	Significant
Thippeswamy	2007	Coconut growers	Significant
Rai and Singh	2010	Cotton growers	Significant
Annual income			
Raghavendra	1997	Arecanut growers	Significant
Reshmy	1998	Coconut growers	Significant
Kumar	1998	Banana growers	Significant

Rai and Singh	2010	Cotton growers	Significant
Innovativeness			
Raghupathi	1994	Command area farmers	Significant
Meti	1998	Cotton growers	Significant
Rathod	2005	Sugarcane growers	Significant
Kharatmol	2006	Vermicompost	Significant
Risk orientation			
Meti	1998	Cotton growers	Significant
Venkatesh Prasad *et al*.	1999	Paddy farmers	Significant
Venkatesh Prasad and Sidda Ramaiah	2000	Paddy and groundnut growers	Significant
Rathod	2005	Sugarcane growers	Significant
Achievement motivation			
Chandregowda and Jayaramaiah	1996	Paddy farmers	Significant
Reshmy	1998	Big and small farmers	Significant
Binkadakatti	2008	Biofertilizer farmers	Significant
Scientific orientation			
Ranganath	1997	Rice farmers	Significant
Anasuya	1997	Cotton farmers	Significant
Kharatmol	2006	Vermicompost	Significant
Mass media utilization			
Venkatesh Prasad *et al*.	1999	Paddy farmers	Significant
Kanavi	2000	Sugarcane growers	Significant
Kharatmol	2006	Vermicompost	Significant
Binkadakatti	2008	Biofertilizer farmers	Significant
Extension participation			
Meti	1998	Cotton growers	Significant
Kanavi	2000	Sugarcane growers	Significant

Rathod	2005	Sugarcane growers	Significant
Kharatmol	2006	Vermicompost	Significant
Rai and Singh	2010	Cotton growers	Significant
Source of information			
Sharanappa	2011	Paddy farmers	Significant
Manjunatha	2011	Cotton farmers	Significant

Above reviews give an insight those variables like education, farming experience, land holding, annual income, extension contact, mass media participation, extension participation, risk orientation, achievement motivation and scientific orientation were having significant relationship with knowledge level of the respondents.

2.5 Constraints faced by the respondents in adoption of transplanting method of redgram cultivation practices

Jagdale and Nimbalkar (1993) indicated that, sowing of Rabi Jowar was due to uncertain rains, lack of knowledge about two bowl seed drill, non-availability of improved seed were the major constraints.

Shivaraj (1996) conducted a study on knowledge and adoption level of IPM practices by Red gram growers of Gulbarga district and revealed that non availability of pheromone traps, lack of knowledge in the selection of integrated pest management and lack of guidance were the major constraints which came in the way of adoption of IPM practices in Redgram.

Sangram (1997) observed that red gram growers were facing problems of non-availability of IPM materials in the market (28.24%), labour shortage (28.84%) and high wages (11.54%) per cent respectively in the adoption of IPM practices.

Kumar (1998) carried out a study on knowledge, adoption and economic performance of banana growers in Bangalore district reported that, the farmers faced the problems of lack of technical guidance, pests and diseases, high investment, low price for the fruits, fluctuation in the prices and exploitation by the middleman.

Thyagarajan and Vasanthakumar (2000) conducted a study on constraints in getting high yield in rice in south Arcot district of Tamil Nadu, and revealed that, ‘lack of reasonable

support price ’was found to be the first important constraint by 36.33% followed by ‘high cost of inputs’ expressed by 34.00 per cent of respondents.

Mutkule *et al.* (2001) conducted a study on constraints in adoption of chilli technology in Nanded district of Maharashtra, and observed that, majority of the respondents (93.33%) experienced the constraints like ‘insecticides and pesticides were costly’ followed by ‘fluctuation of prices of chilli’ (86.00%).

Nagaraj (2002) conducted a study on knowledge of improved cultivation practices of sugarcane and their extent of adoption by farmers in Bhadra command area of Davanagere district and reported that majority of the respondents faced the problem of high cost of fertilizer (92.48%), followed by delay in release of loan by the banks (81.65%), high rate of interest (80.82%), delay in transport of harvested cane from field by the factory (76.23%), delay in issuing permit by the factory (76.23%), improper guidance from the extension workers (72.90%), delay in payment by factory (69.57%) and shortage of labour (49.57%).

Maraddi *et al.* (2004) conducted a study on constraints in adoption of Cotton production technologies in Malaprabha Command area of Karnataka and reported that many of constraints were related to economic (75.00%) and technical guidance (71.66%) as compared to other categories of constraints related to inputs (67.58%), production (60.00%) and marketing (57.77%).

Thiranjangowda (2005) conducted a Study on Cultivation and Marketing Pattern of Selected Cut Flowers in Belgaum District revealed that, high investment in poly house (75.00%), problems of pests and diseases (65.00%), high cost of fertilizers (45.00%) and high cost of plant protection chemicals (17.50%), are the main constraints regarding gerbera flower cultivation.

Nayak (2007) carried out a study on management practices of Pineapple growers in Karnataka and revealed that cent per cent of respondents were facing the problem of lack of regulated markets, where as almost all the farmers faced the problem of low market price for the produce (97.50%). Micronutrient deficiency in soil (92.50%), lack of storage facility (88.12%), lack of technical guidance (85.63%), lack of processing units (80.00%), non availability and high labour charges (70.63%) were the other reported problems. Further less than sixty per cent of respondents expressed problems of exploitation from pre-harvest

contractors and middle men (57.50%) and non availability of required quantity of fertilizers in time (33.12%).

2.6 Cost and returns of transplanting method of redgram production

Pandurangadu and Raju (1990) in a study conducted in Andra Pradesh revealed that an alarming rise in the cost of cultivation of cotton was largely attributed to the increased use of expensive and broad-spectrum chemicals, such as synthetic pyrethroids. It is suggested that all farmers adopted IPM practices, which involve the use of low–cost but effective pest killing technique like pheromone traps and biological control methods.

Razack (2000) studied the economics of IPM in paddy and cotton in Tamil Nadu and reported that IPM farmers have gained Rs.1142 per hectare in paddy and in cotton Rs. 6821.27 per hectare. It was further observed that gain in cotton was mainly due to the reduction in pesticide use rather than increase in yield of cotton.

Rajaram *et al.* (2000) in a study of comparison of Integrated Pest Management and chemical control with traditional practices in cotton crop in Tamil Nadu between 1996 and 1999 revealed that the cost benefit ratio of the IPM system was 1:2.2 and 1:2.4 during 1996-97 and 1997-98 respectively compared to the chemical control value of 1:1.5 and 1:1.3 respectively.

Korikantimath *et al.* (2000) in their study found that the gross and net returns of the mixed cropping system of chilli with cotton were Rs. 24640.00 and Rs. 13054.60 per hectare, respectively while benefit cost ration was Rs. 2.13.

Kerutagi *et al.* (2000) in their study revealed that the total cost of cultivation of brinjal per hectare was Rs. 60,576.13. The gross returns and net returns were found to be Rs. 2, 14,750.00 and 1, 54,173.87, respectively and benefit cost ratio was Rs. 3.55.

Radha and Choudhary (2005) conducted study on costs and returns in cotton seed production vis-à-vis commercial production of cotton in Andhra Pradesh and revealed that the per acre total cost of production of cotton seed (Rs.74, 412) was higher than that of commercial cotton production (Rs.26, 461), of which human labour occupied the major share in both cotton seed production (53.86%) as well as commercial cotton production (19.03 %). The operational costs of all the items were comparatively higher in seed production (Rs.68,101/acre) over commercial production (Rs.16,166/ acre). This was due to the

additional operations like gap filling, rouging, emasculation, pollination, etc., involved in cotton seed production. Thus, the operational costs took the major share of 91 per cent in seed production as compared to 61 per cent in commercial production. It revealed that seed production gives positive returns with the cost-benefit ratio of 0.29:1.00 when compared to commercial production (1.00:0.35).

Methodology

III. METHODOLOGY

This chapter deals with research methods and techniques used in the study. It mainly describes the procedure followed in the selection of districts, taluka, villages and respondents. Besides description of study area, variables and their measurement procedure, data collection method and use of statistical tools have also been outlined. They are presented in the following headings.

3.1 Research design

In the present investigation, ex-post facto research design was employed. This design was appropriate because of the phenomenon had already occurred. Ex-post-facto research is the most systematic empirical enquiry in which the researcher does not have any control over independent variables as their manifestation has already occurred or as they are inherent and not manipulatable thus, inferences about relations among variable were made without direct intervention from concomitant variation of independent and dependent variables.

3.2 Selection of the district

The study was conducted in Bidar district of Karnataka state during the year 2010-11. Bidar district was purposively selected for the study because of this district is considered as pulse bowl of Karnataka state where in pulses like Blackgram, Greengram, Redgram and Bengal gram are grown in 195407 ha area. Among these pulses, the share of redgram is 67,000 ha area. Bidar district had highest area under transplanting method of redgram cultivation (4360 ha).

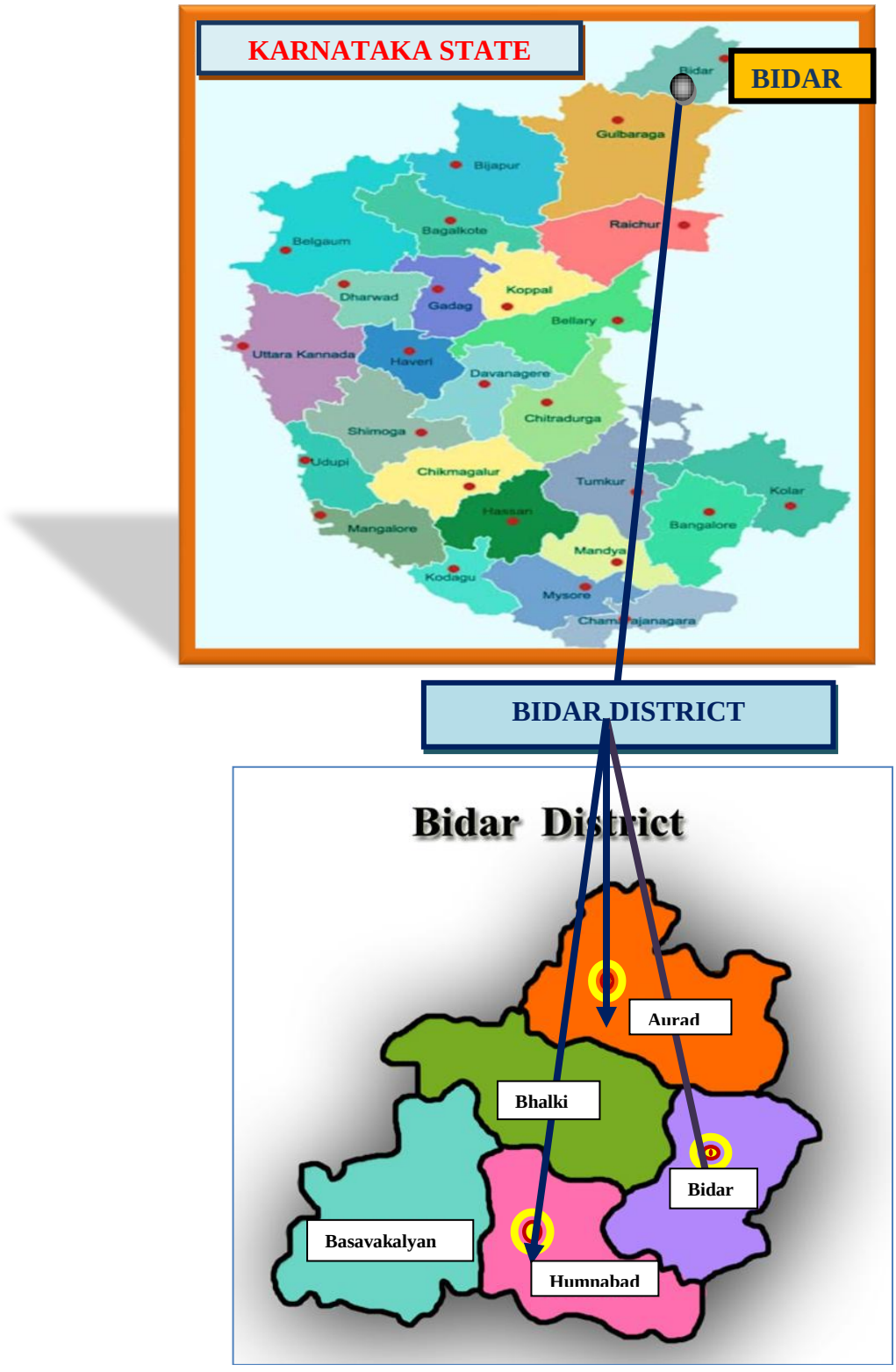


Fig.1: Map showing the study area

3.3 Brief description of study area

The Bidar district is situated between 17°35'' and 18°25'' North latitudes and 74°42' and 73°39' east longitudes and lies in the extreme north of the state. Its maximum length from east to west is 93.4 km and from north east to south west 11.52 km. The district has geographical area of 5,451 sq.km with 4, 74,224 ha of agricultural land of which 1, 71,807 ha is the cultivable land. The district receives an average rainfall of 890.60 mm per year. It is situated at a height of 618.7 mt above the mean sea level. It is surrounded by Andhra Pradesh and Maharashtra states at North – East and west directions, respectively and Gulbarga district at south direction.

The soil type is red laterite and medium to deep black soil. Bidar district lies under agricultural zone-1(Northern transitional zone). The district receives *Kharif* rains from July to September and *Rabi* rains in the month of October to December. The major crops in the *Kharif* season among cereals are Paddy, Jowar *etc*., among pulses are Redgram, Greengram, Blackgram, Horsegram *etc*., and among oil seeds are Groundnut, Sunflower, Safflower and with respect to commercial crops Sugarcane and Cotton are being grown.

Since the pulses occupy the majority of the area in Bidar district and is considered as "PULSE BOWL OF KARNATAKA" along with Gulbarga district. The agro-climatic conditions are best suited for pulse crops cultivation. The area under redgram crop in Karnataka during the year 2009-10 was 6, 04,375 ha with a production of 2, 81,954 tonnes. Whereas the total area under the cultivation of redgram in Bidar district was 67,000 ha and production was 50,220 tonnes and the total area under the transplanting method of redgram cultivation in Bidar district were 4,360 ha.

3.4 Selection of taluks

Bidar district comprises of five taluks namely, Aurad, Basav Kalyn, Bhalki, Bidar, and Humnabad. Out of five taluks, three taluks namely Aurad, Bidar and Humnabad were purposively selected, because they had highest area under transplanting method of red gram cultivation and highest number of demonstrations on transplanting method of redgram cultivation was conducted by KVK, Bidar.

3.5 Selection of villages

From each taluka, four villages and from each village, ten farmers were selected by following highest number of demonstration on transplanting method of redgram cultivation farmer available in the village and highest area under transplanting redgram cultivation . The

villages selected were Hudagi, Nimbur, Chitaguppa and Talamadagi from Humnabad taluka. Astur, Magadal, Janawad and Rajgera from Bidar taluka. Jojana, Gadikushanoor, Shambelli and Naganapalli from Aurad taluka. Thus totally twelve villages were selected for the study.

3.6 Selection of the respondents

List of farmers from each of the twelve selected villages was obtained. From each village, ten farmers were selected by following random sampling procedure. Again from each village, five farmers from the list who have undergone demonstration on transplanting redgram conducted by KVK, Bidar and five non-demonstration farmers who were practicing transplanting method of redgram cultivation from the each village were randomly identified for making total sample size was one hundred and twenty (i.e. 60 demonstration and 60 non-demonstration farmers). Thus 120 farmers formed the total sample for study**.**

Selection of the respondents

n=120

Taluks	**Villages**	**Respondents**		**Total**
		Demonstration farmers (n_1)	**Non-demonstration farmers (n_2)**	
Humnabad	Hudagi	5	5	10
	Nimbur	5	5	10
	Chitaguppa	5	5	10
	Talamadagi	5	5	10
Bidar	Astur	5	5	10
	Magadal	5	5	10
	Janawad	5	5	10
	Rajgera	5	5	10
Aurad	Jojana	5	5	10
	Gadikushanoor	5	5	10
	Shambelli	5	5	10
	Naganapalli	5	5	10
Total (n)		**60**	**60**	**120**

3.7 Variables for the study

3.7.1 Dependent variables

In the light of objectives set for the study the dependent variables considered were;

1. Knowledge
2. Adoption

3.7.2 Independent variables

Based on the review of literature and discussion with the scientists of UAS, Raichur and Extension functionaries of Department of Agriculture, the following independent variables were selected for the study.

1. Age
2. Education
3. Land holding
4. Annual income
5. Farming experience
6. Extension participation
7. Mass media utilization
8. Source of information
9. Innovativeness
10. Risk orientation
11. Achievement motivation
12. Scientific orientation

3.8 Operationalization and measurements of the variables

3.8.1 Dependent variables

3.8.1.1 Knowledge

Knowledge was operationally defined, as the extent to which the demonstration on transplanting method of redgram cultivation techniques was knew by the respondents.

For the present study an operational measure for knowledge was developed by constructing a “teacher made knowledge test”. The knowledge test was constructed based on the package of practices developed for transplanting method of redgram cultivation by University of Agricultural Sciences, Raichur. Lists of 30 cultivation practices were developed

for the purpose and each practice was administered in the form of questions to respondents to obtain the response from transplanting redgram growers. The questions were provided with multiple choice answers. The questions and answers pertaining to knowledge test were carefully designed in consultation with experts, specialized in transplanting method of redgram cultivation and other KVK staff. The questions covered full range of cultivation practices beginning from variety selected till the crop yield. The answers were quantified by giving one score to the correct answer and zero score to the incorrect one. As a result the maximum score that one could get was 30 and the minimum was zero. The total knowledge score for individual respondent was calculated by summing up the number of items correctly answered. After computing knowledge level score, the respondents were grouped in to low, medium and high categories based on the mean and standard deviation as shown below.

Knowledge category	**Score**
Low	(Mean – 0.425SD)
Medium	(Mean ± 0.425SD)
High	(Mean + 0.425SD)

The above procedure was followed by Angadi (1999).

3.8.1.2 Adoption

In the present study, adoption referred to the acceptance and practice of some or all the recommended cultivation practices of demonstration on transplanting method of redgram.

Based on the review of literature and in consultation with KVK, Bidar subject matter specialists and experts, improved transplanting method of redgram cultivation practices were identified namely, variety, seed rate, thinning practices, age of the seedling, transplanting time, recommended spacing, recommended doses etc. The important practices, which were related to the transplanting method of redgram cultivation, were selected to know the adoption pattern. Thus, total 25 practices were selected for the study. The scores for each of the individual practices adopted were arrived by viewing relative importance of the practices in consultation with specialist. The following score were given for full, partial and non-adoption of the recommended practices.

Adoption level	**Score**
Full adoption	2
Partial adoption	1
Non adoption	0

The partial adoption was arrived at taking into cognizance any deviation from the recommendation. The maximum score that respondents could obtain was 50 and the minimum was zero. Depending upon the total score obtained by each of the respondent, they were grouped into three categories with mean and standard deviation as a measure of check and expressed as below

Category	**Score**
Low	(Mean – 0.425SD)
Medium	(Mean ± 0.425SD)
High	(Mean + 0.425SD)

3.8.2 Independent variables

Based on the past research studies and in consultation with experts, the variables which were found directly or indirectly related to knowledge and adoption of demonstration on transplanting method of redgram cultivation practices were identified for the study. Variables such as age, education, farming experience, land holding, annual income, innovativeness, risk orientation, achievement motivation, scientific orientation, mass media utilization, extension participation and sources of information were selected for the study. The method followed for categorizing each variable is given below. The results were expressed in frequency and percentages.

3.8.2.1 Age

It is referred to the chronological age of the respondent at the time of investigation. The age of the respondents was recorded as mentioned by them in completed years. The respondents were categorized in to three age groups based on the procedure followed by Karpagam (2000).

Category	**Age (in years)**
Young	Up to 30 years
Middle	31 to 50 years
Old	Above 51 years

3.8.2.2 Education

It is operationalized as the number of years of formal education the person/ respondent has undergone. For each year of schooling, a score of one was given. The respondents were grouped into different categories based on procedure followed by Shashidhara (2004).

Category	Education
Illiterate	Cannot read and write
Primary school	1-4th standard
Middle school	5-7th standard
High school	8-10th standard
Pre-university	11th and 12th standard
Graduate	Above 12th standard

3.8.2.3 Farming experience

Experience refers to the number of years followed farming as their livelihood practices by the respondent. The scoring pattern followed by Chandargi (1996) was used in the study with suitable modification. Based on the mean and standard deviation of the scores obtained, the respondents were categorized into low, medium and high categories.

Category	Range
Low	Below (mean – 0.425SD)
Medium	Between (mean ± 0.425SD)
High	Above (mean + 0.425SD)

3.8.2.4 Land holding

It is the actual land owned by the family of farmers in acres. The conversion procedure as specified in the notification brought out by Government of India circular on 280-12/16/19-RD-III-Vol-X dated 15 November, 1991 (Anonymous, 1992) was used. Accordingly one acre of wet land is to three acres of dry land. The respondents were categorized based on the procedure followed by Hiremath (2000).

Category	Land holding
Marginal farmer	Up to 2.50 acres
Small farmer	2.51 to 5.00 acres
Semi-medium farmer	5.01 to 10.00 acres
Medium farmer	10.01 to 25.00 acres
Big-farmer	More than 25.00 acres

3.8.2.5 Annual income

It was measured by considering the total income of the family from all the sources. The classification was as suggested by Ministry of Rural Development, Government of India was used and the same was followed by Deepak (2003).

Category	**Income (Rs. /annum)**
High income	Above Rs. 51,000
Medium income	Rs. 34,001 to 51,000
Semi-medium income	Rs. 17,001 to Rs.34,000
Low income	Up to Rs. 17,000

The results were expressed in frequency and percentage for each category.

3.8.2.6 Innovativeness

It is the degree to which a farmer is relatively earlier in adopting the innovations when compared to others. The variable was quantified by using the scale developed by Moulik and Rao (1973) and as followed by Ningareddy (2005) was used with suitable modifications.

This scale includes five statements; the scoring pattern followed is as given below

Statements	**Scores**				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Positive items	5	4	3	2	1
Negative items	1	2	3	4	5

sThe total score obtained by a respondent on this scale formed the innovativeness score for that respondent. The scores obtained for each statement were summed up to get the total score of the individual. The maximum and minimum scores an individual could obtain were 25 and 5, respectively. Further, the respondents were grouped into three categories using mean and standard deviation as measure of check.

Category	**Score**
Low	Less than (X – 0.425 SD)
Medium	In between (X ± 0.425 SD)
High	More than (X + 0.425 SD)

3.8.2.7 Risk orientation

It is the degree to which a farmer is oriented towards risk and uncertainty in agriculture and has the courage to face the various risks involved in agricultural aspects.

Nagaraja (1989) developed a scale for measuring risk orientation of farmers. The scale contained six statements. The same scale was used in the present study. First and fourth statements were negatively keyed and all other were positively keyed. In case of positive statements a score of one was assigned for the positive response (agree) and zero score for negative (disagree) response. This was reverse in the case of negative statements. The scores were added to get total score of the respondents. Minimum and maximum score one can get is 0 and 6, respectively. Later the respondents were grouped into the three categories based on total risk orientation scores using mean and standard deviation.

Category	**Score**
Low	(Mean – 0.425SD)
Medium	(Mean ± 0.425SD)
High	(Mean + 0.425SD)

3.8.2.8 Achievement motivation

It is defined as the degree to excel regardless of social rewards. It is the desire to do well not so much for the sake of social recognition or prestige, but to attain an inner feeling of personal accomplishment. In the present study, the achievement motivation is defined as the value associated with an individual who drives him to excel in farming and related field and there by attain a sense of personal accomplishment.

The achievement motivation scale developed by Singh (1978) was used in the present study. The scale has six statements in the form of questions. Each question has three alternative answers. The respondent has to tick one of the alternatives to each statement.

The questions, 1, 4 and 6 classified as, positive statements were scored as 2, 1 and 0. The scoring is reverse for other selected negative statements. The summed up value gave the total score of the individual farmer. Thus the score ranged from 0 to 12.

To assess the level of achievement, the respondents were categorized as low, medium and high based on mean (x) and standard deviation (SD) as measures of check.

Category	**Score**
Low	(Mean – 0.425SD)
Medium	(Mean ± 0.425SD)
High	(Mean + 0.425SD)

3.8.2.9 Scientific orientation

It is defined as the degree to which a farmer is oriented to the use of scientific methods in agriculture. The variable was quantified by using the scientific orientation scale of Supe (1969), with slight modifications made by Nagaraj (1989). The scale has six statements with three response categories as 'Agree', 'Undecided' and 'Disagree', for five statements (except statement No. 2) a score of two was assigned to 'Agree' response, a score of one for undecided and zero score for 'Disagree' response. The scoring procedure was reverse in the case of second statement.

The summation of the score obtained by a farmer for all the six statements indicates his scientific orientation. The total score ranged from 0 to 12. The level of scientific orientation was categorized as indicated below using the mean and standard deviation as a measure of check.

Category	**Score**
Low	Less than (Mean – 0.425 SD)
Medium	Between (Mean ± 0.425 SD)
High	More than (Mean + 0.425 SD)

3.8.2.10 Mass media utilization

Mass media utilization referred to the degree to which the respondents utilized them in terms of listening to farm broadcast, viewing telecast and reading newspaper. In the present research mass media utilization of respondents was studied according to their possession and extent of utilization. Mass media possession was measured on two point continuum such as,

1. Item possessor/ subscriber
2. Item not possessor/ subscriber

Whereas, extent of utilization was measured on three point continuum i.e., regular, occasional and never. The data has been presented in frequency and percentage. This procedure was adopted by Hiremath (2000).

To assess the level of mass media utilization, the respondents were categorized as low, medium and high based on mean (x) and standard deviation (SD) as measures of check.

Category	**Score**
Low	(Mean – 0.425SD)
Medium	(Mean ± 0.425SD)
High	(Mean + 0.425SD)

3.8.2.11Extension participation

This variable was quantified by following the procedure of extension activities were prepared and the respondent were asked to indicate their extent of participation in each of them. The scoring procedure was followed according to Sowjanya (2007).

Sl. No.	Extension activities	Extension participation		
		Regular	Occasionally	Never
1.	Training	2	1	0
2.	Extension meeting	2	1	0
3.	Field day	2	1	0
4.	Krishi mela	2	1	0
5.	Demonstrations	2	1	0
6.	Field visits	2	1	0
7.	Group discussion	2	1	0
8.	Educational tour	2	1	0

3.8.2.12 Sources of information

Sources of information refer to the frequency with which the sources or channel is consulted by the transplanting method of redgram growers in order to seek information regarding recommended production practices of transplanting method of redgram cultivation.

Sl. No.	Sources of information	Consulted	Non-consulted	Rank
1	Agricultural assistant	1	0	
2	Assistant agricultural officer	1	0	
3	Agricultural officer	1	0	
4	Assistant director of agricultural	1	0	
5	Agricultural university SMS	1	0	
6	Private agency extension officer	1	0	
7	Progressive farmers	1	0	
8	Neighbours	1	0	
9	Relatives	1	0	
10	Radio	1	0	
11	News paper	1	0	
12	Farm magazine	1	0	
13	Television	1	0	

To find out the pattern and extent of consultation of information sources by the farmers the source were listed and the farmers were asked to indicate whether they had consulted or not against each of the information sources and then these responses are expressed in frequency and percentage. Further, to find out the level of consultation of information each of these sources was expressed in rank. The data obtained was analyzed by using frequency and percentage

3.9 Constraints faced by the farmers

During investigation, respondents expressed many reasons due to which they could not use recommended practices in their farming. The reasons or causes were termed as constraints in the study. The respondents were asked to indicate the constraints faced in adoption of the recommended practices. Obtained problems were expressed in terms of frequency and percentage.

3.10 Cost and returns of transplanting method of redgram production

In the present study the economics of Redgram cultivation was arrived at computing per hectare cost and returns structure. Total operational cost was worked out. The gross returns, net returns and Benefit: cost ratio was calculated by using the below formula

Gross returns (Rs) = Actual per acre yield of redgram x market price (Rs. /tons)

Net returns (Rs) = Gross returns (Rs/acre) -total operational (cost/acre)

Benefit: cost ratio (operational cost) (BCR)

$$\text{BC Ratio} = \frac{\text{Gross returns (Rs/ha)}}{\text{Total operational cost (Rs/ha)}}$$

3.11 Instruments used for data collection

Keeping in view the objectives and variables of the study, a structured interview schedule was prepared by reviewing the previous research studies, consulting and discussing with the experts and professional workers in the field of agricultural extension and state department of agriculture. After construction of schedule and prior to its administration to the sample it was pre-tested by administering it to farmers in non-sample area. On the basis of pre-tested results, necessary modifications and changes were made in the schedule. The final format of the schedule is furnished in Appendix I.

The data were collected by personal interview by researcher using structured interview schedule.

3.12 Statistical tools and tests used

The statistical tools such as mean, standard deviation, frequency, percentage and correlation were employed wherever found appropriate and data were analyzed to draw valid inferences.

Results

IV. RESULTS

The findings of the present investigation are presented in this chapter under the following subheads

4.1 Knowledge level of the respondents with respect to transplanting method of redgram cultivation practices

4.2 Adoption level of the respondents with respect to transplanting method of redgram cultivation practices

4.3 Personal, socio-economic and psychological characteristics of the respondents

4.4 Relationship between selected independent variables of the respondent with their knowledge and adoption level

4.5 Constraints faced by the respondents in adoption of transplanting method of redgram cultivation practices

4.6 Cost and return of transplanting method of regram production

4.1 Knowledge level of the demonstration and non-demonstration farmers with respect to transplanting method of redgram cultivation practices

4.1.1 Overall knowledge level of the respondents

It is observed from the Table 1 and (Fig: 2) that, fifty per cent of demonstration farmers and thirty per cent of non-demonstration farmers were belonged to medium knowledge category, while, 31.67 per cent of demonstration and 21.67 per cent of non-demonstration farmers were belonged to high knowledge category. Whereas 18.33 per cent of demonstration and 48.33 per cent of non-demonstration farmers were belonged to low knowledge category.

4.1.2 Knowledge level of the respondents about the individual practices of transplanting method of redgram cultivation

The results presented in Table 2 indicated that, with regard to nursery management practices cent per cent of demonstration farmers had knowledge about recommended variety, expressed deep black soil as best suited for transplanting method and recommended seed rate. Majority of demonstration farmers had knowledge about age of the seedling for transplanting and two seeds are placed in per polythene bag for seedling preparation (88.33%) followed by materials used for filling the polythene bag and two times daily watering to the seedlings (85.00%), size of the polythene bag for seedling preparation (83.33%), thinning practice (81.67%) and seed treatment (76.67%).

Table 1: Overall knowledge level of the respondents with respect to transplanting method of redgram cultivation

n=120

Sl. No.	Categories	Demonstration farmers (n_1=60)		Non-demonstration farmers (n_2=60)	
		F	%	F	%
1	Low (Mean- 0.425SD)	11	18.33	29	48.33
2	Medium (Mean ± 0.425SD)	30	50.00	18	30.00
3	High (Mean + 0.425SD)	19	31.67	13	21.67
Mean		25.60		14.42	
SD		1.67		4.03	

F-Frequency
%-Percentage

In case of non-demonstration farmers regarding nursery management most of the farmers (91.67%) expressed that deep black soil as a best suited for transplanting method. Majority (75.00%) of the farmers had knowledge about recommended variety. More than fifty per cent of the farmers had knowledge about recommended seed rate (66.67%), followed by age of the seedling for transplanting (53.33%). Fifty per cent of farmers had knowledge about materials used for filling the polythene bag for seedling preparation and thinning practice. Less than fifty per cent of farmers had knowledge about seed treatment (46.67%), followed by size of the polythene bag (43.33%), two seeds are placed in per polythene bag for seedling preparation and two times daily watering to the seedlings (41.67%).

With respect to main field management practices cent per cent of demonstration farmers had knew the correct time for transplanting. Ninety per cent of demonstration farmers had knowledge about the depth of pit in main field for seedling transplant, one seedling transplant per pit, nipping practices and recommended yield. Majority of farmers had known the inter cultivation practices (88.33%) followed by irrigation of water (86.67%), eighty five per cent of them aware of pod borer pest and soybean as the best suited for intercrop, recommended spacing and quantity of FYM application (83.33%), number of plants per acre (81.67%), eighty per cent of farmers aware of wilt diseases, summer ploughing for field preparation (76.67%), seventy five per cent of farmers had known the time of FYM application , with respect to pest control seventy per cent of farmers had correct knowledge. Over fifty per cent of farmers had knowledge about recommended dose of fertilizer application (66.67%) followed by use of growth regulator (65.00%), disease control (63.33%) and gypsum application (61.67%).

In case of non-demonstration farmers with regard to main field management practices majority of the farmers had knowledge about correct time for transplanting (71.67%) and quantity of FYM application (70.00%). Over fifty per cent of farmers had knowledge about irrigation of water (68.33%), followed by inter cultivation practices (66.67%), sixty five per cent of farmers had known the recommended yield, time of FYM application and nipping practices (63.33%). Around sixty (61.67%) per cent of farmers had aware of pod borer pest and wilt disease. Fifty five per cent of farmers had known the one seedling transplant per pit and expressed soybean as the best suited intercrop in transplanting redgram. Fifty per cent of farmers had known the pest control. Less than fifty per cent of farmers had knowledge about depth of pit in main field (48.33%) followed by recommended dose of fertilizer application and disease control (46.67%), recommended spacing (45.00%), total number of plants per acre (43.33%), gypsum application (41.47%) and use of growth regulator (40.00%).

Table 2: Knowledge level of the respondents about individual practices of transplanting method of redgram cultivation

n=120

Sl. No	PRACTICES	KNOWLEDGE LEVEL			
		Demonstration farmers (n_1=60)		Non-demonstration farmers (n_2=60)	
		F	%	F	%
I. Nursery management practices					
1.	Variety (BSMR-736)	60	100.00	45	75.00
2.	Suitable soil type (Deep black soil)	60	100.00	55	91.67
3.	Seed rate (1 Kg/acre)	60	100.00	40	66.67
4.	Seed treatment (With trichoderma @ 4gm/kg of seeds)	46	76.67	28	46.67
5.	Size of the polythene bag (6" x 4" (l x b) with 200 μ gauge)	50	83.33	26	43.33
6.	Materials for filling the polythene bag (Soil, Sand and Compost)	51	85.00	30	50.00
7.	Two seeds are placed in per polythene bag with 1cm depth	53	88.33	25	41.67
8.	Thinning practice	49	81.67	30	50.00
9.	Two times daily watering to the seedlings	51	85.00	25	41.67
10.	Age of the seedling (30-40 days old)	53	88.33	32	53.33
II. Main field management practices					
11.	Summer ploughing (2-3 times done in March-April)	46	76.67	40	66.67
12.	Transplanting time (June)	60	100.00	43	71.67
13.	FYM application (5 tone/acre)	50	83.33	42	70.00
14.	Time for FYM application (3 Weeks before transplanting)	45	75.00	38	63.33
15.	Depth of pit in main field (15 cm)	54	90.00	29	48.33
16.	Spacing (6x3 ft)	50	83.33	27	45.00
17.	Total number of plants (2420 plants/acre)	49	81.67	26	43.33
18.	Seedlings required per pit (One seedling/pit)	54	90.00	33	55.00
19.	Dose of fertilizer (10:23:50 kg/acre NPK)	40	66.67	28	46.67
20.	Soil application (Gypsum @ 45-50 kg/acre)	37	61.67	25	41.67

21.	Growth regulator (NAA (planofix) @ 0.5 ml/lit of water)	39	65.00	24	40.00
22.	Irrigation required (3-4 times)	52	86.67	41	68.33
23.	Intercultivation practices (1-2 times)	53	88.33	40	66.67
24.	Nipping practice (After 50 DAT)	54	90.00	38	63.33
25.	Important pest (Pod borer)	51	85.00	37	61.67
26.	Pest control (Indoxacarb (14.5 SC) 0.3 ml/lit (Avaunt))	42	70.00	30	50.00
27.	Important disease (Wilt)	48	80.00	37	61.67
28.	Disease control (Carbendizim 50 WP 1.0 gm/lit)	38	63.33	28	46.67
29.	Intercrop	51	85.00	33	55.00
30.	Recommended yield (12-14 quintals/acre)	54	90.00	39	65.00

F-Frequency
%-Percentage

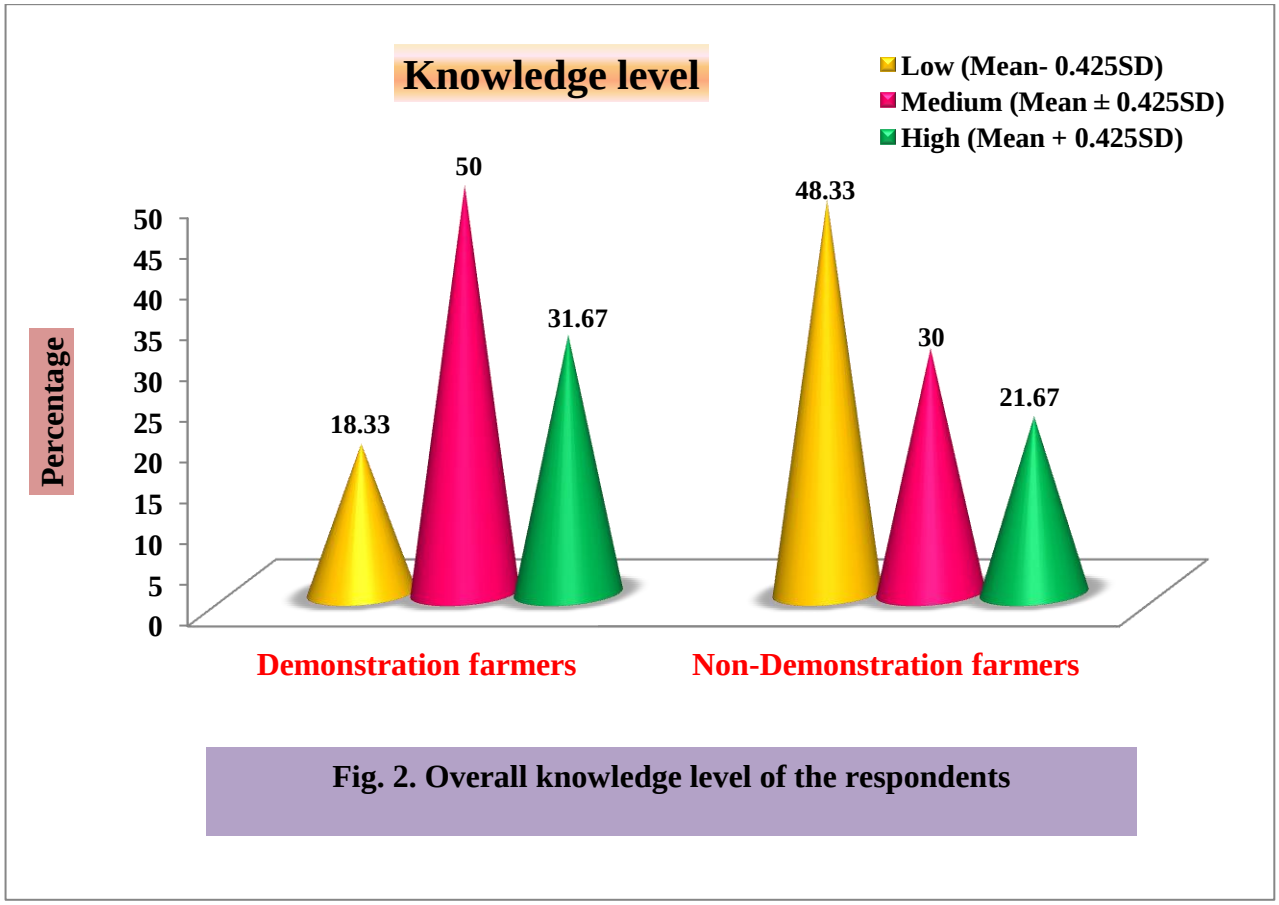


Fig. 2. Overall knowledge level of the respondents

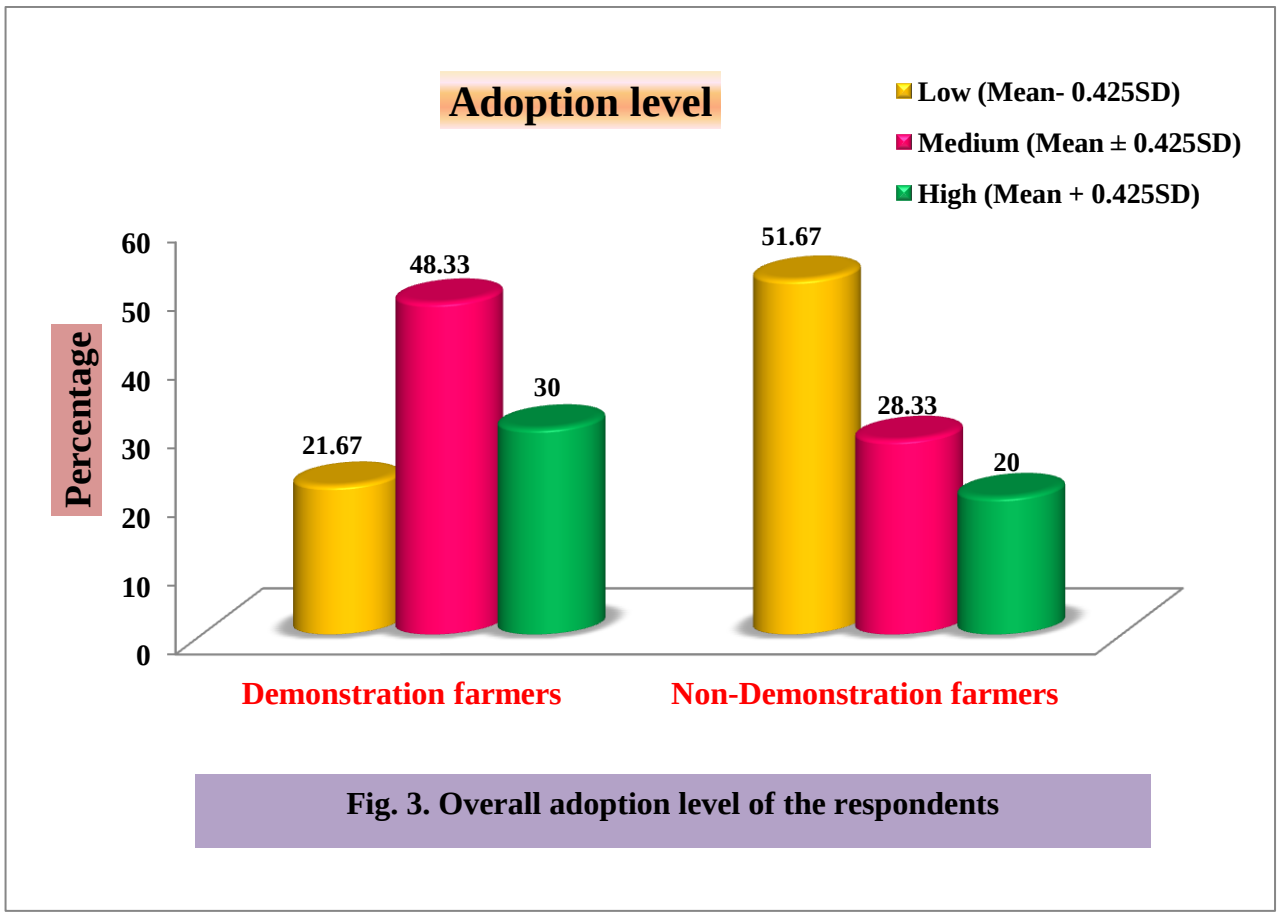


Fig. 3. Overall adoption level of the respondents

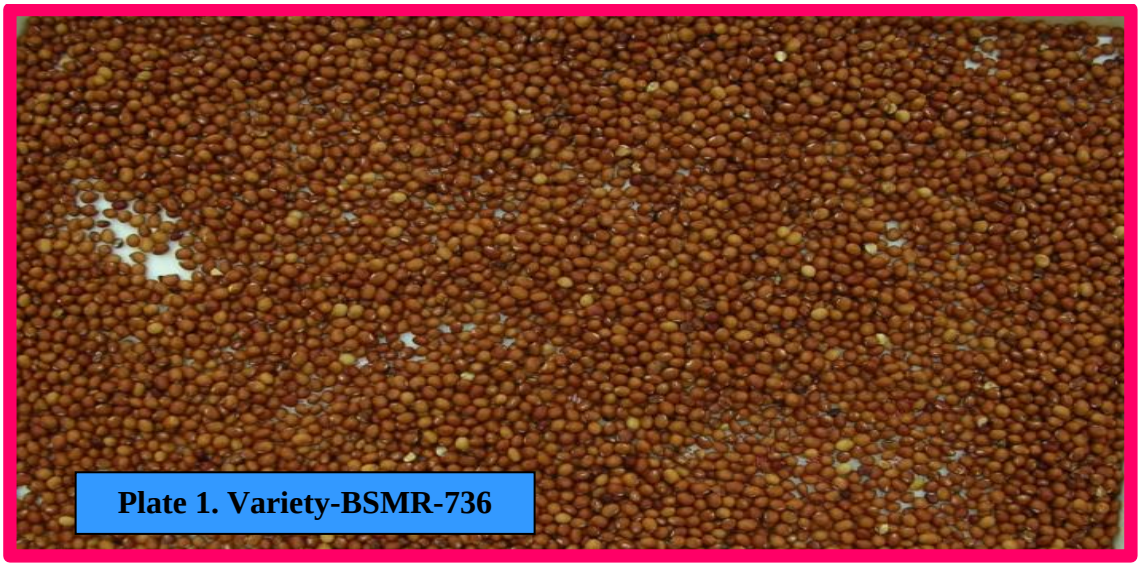


Plate 1. Variety-BSMR-736

Plate 2. Seed treatment with Trichoderma @ 4gm/kg of seeds

Plate 3. Materials filling the polythene bag

Plate 4. Seeds dibbling in polythene bag

Plate 5. Watering to the seedlings

Plate 6. Thinning practices

Plate 7. Seedlings ready for transplanting

Plate 8. Transplanting seedlings

Plate 9. Established Seedlings

Table 3: Overall adoption level of the respondents with respect to transplanting method of redgram cultivation

n=120

Sl. No.	Categories	Demonstration farmers (n_1=60)		Non-demonstration farmers (n_2=60)	
		F	%	F	%
1	Low (Mean- 0.425SD)	13	21.67	31	51.67
2	Medium (Mean ± 0.425SD)	29	48.33	17	28.33
3	High (Mean + 0.425SD)	18	30.00	12	20.00
Mean		42.82		21.50	
SD		3.06		7.38	

F-Frequency
%-Percentage

Table 4: Adoption level of the respondents about individual practices of transplanting method of redgram cultivation

n=120

Sl. no.	Statements	Demonstration Farmers (n_1=60)						Non-demonstration Farmers (n_2=60)					
		FA		PA		NA		FA		PA		NA	
		F	%	F	%	F	%	F	%	F	%	F	%
I. Nursery management practices													
1.	Variety (BSMR-736)	60	100.00	0	0.00	0	0.00	45	75.00	0	0.00	15	25.00
2.	Seed rate (one Kg/acre)	50	83.33	10	16.67	0	0.00	36	60.00	4	6.67	20	33.33
3.	Seed treatment (with Trichoderma)	37	61.67	9	15.00	14	23.33	18	30.00	10	16.67	32	53.33
4.	Two seeds are in per polythene bag	48	80.00	5	8.33	7	11.67	20	33.33	5	8.33	35	58.33
5.	Thinning practice	40	66.67	9	15.00	11	18.33	30	50.00	5	8.33	25	41.67
6.	Two times daily watering to the seedlings	42	70.00	9	15.00	9	15.00	18	30.00	9	15.00	33	55.00
7.	Age of the seedling (30-40 days old)	41	68.33	15	25.00	4	6.67	30	50.00	4	6.67	26	43.33
II. Main field management practices													
8.	Summer ploughing (2-3times done in March-April)	31	51.67	15	25.00	14	23.33	25	41.67	13	21.67	22	36.67
9.	Transplanting time (June)	46	76.67	14	23.33	0	0.00	33	55.00	10	16.67	17	28.33
10.	FYM application (5 tone/acre)	25	41.67	15	25.00	20	33.33	24	40.00	12	20.00	24	40.00
11.	Time for FYM Application	25	41.67	15	25.00	20	33.33	22	36.67	12	20.00	26	43.33
12.	Recommended spacing (6x3 ft)	41	68.33	5	8.33	14	23.33	27	45.00	13	21.67	20	33.33

Sl. no.	Statements	Demonstration Farmers (n_1=60)						Non-demonstration Farmers (n_2=60)					
		FA		PA		NA		FA		PA		NA	
		F	%	F	%	F	%	F	%	F	%	F	%
13.	Total Number of plants per acre (2420 plants/acre)	32	53.33	11	18.33	17	28.33	19	31.67	7	11.67	34	56.67
14.	Depth of pit in main field (15 cm)	42	70.00	10	16.67	8	13.33	20	33.33	9	15.00	31	51.67
15.	One seedling transplant per pit	50	83.33	0	0.00	10	16.67	31	51.67	0	0.00	29	48.33
16.	Recommended dose of fertilizer (10:23:50 kg/acre NPK)	32	53.33	8	13.33	20	33.33	18	30.00	8	13.33	34	56.67
17.	Gypsum applications (45-50 kg/acre)	27	45.00	6	10.00	27	45.00	20	33.33	5	8.33	35	58.33
18.	Growth regulator (NAA @ 0.5 ml/lit)	28	46.67	7	11.67	25	41.67	20	33.33	4	6.67	36	60.00
19.	Irrigation required (3-4 times)	38	63.33	9	15.00	13	21.67	22	36.67	12	20.00	26	43.33
20.	Intercultivation practices (1-2 times)	48	80.00	3	5.00	9	15.00	30	50.00	8	13.33	22	36.67
21.	Nipping practic (After 50 DAT)	49	81.67	4	6.67	7	11.67	31	51.67	5	8.33	24	40.00
22.	Pest management- pod borer (Indoxacarb (14.5 SC) 0.3 ml/lit)	30	50.00	8	13.33	22	36.67	25	41.67	5	8.33	30	50.00
23.	Disease management-wilt (Carbendizim 50 WP 1.0 gm/lit)	29	48.33	8	13.33	23	38.33	21	35.00	4	6.67	35	58.33
24.	Intercrop (Soybean)	35	58.33	7	11.67	18	30.00	25	41.67	7	11.67	28	46.67
25.	Recommended yield obtained	38	63.33	22	36.67	0	0.00	29	48. 33	6	10.00	25	41.67

F-Frequency
%-Percentage

Plate 10. Irrigation

Plate 11.Fertilizer application

Plate 12. Nipping practices

Plate 13. Intercrop Redgram + Soybean

Plate 14. Crop at maturity

4.3 Personal, socio-economic and psychological characteristics of the respondents

4.3.1 Age

The data in Table 5 and Fig:4 revealed that, sixty per cent of demonstration and 46.67 per cent of non-demonstration farmers were belonged to the middle age group, followed by young age of demonstration (23.33%) and non-demonstration farmers (20.00%) and old age group of demonstration (16.67%) and non-demonstration farmers (33.33%).

4.3.2 Education

It is observed from Table 5 and Fig: 5 that, 35.00 per cent of the demonstration and 25.00 per cent of the non-demonstration farmers were educated up to high school, followed by college (25.00% and 13.33%), graduate (16.67% and 3.33%), middle school (11.67 and 23.33%) and primary school (6.67% and 16.67%) respectively. whereas, only five per cent of demonstration and 18.33 per cent of non-demonstration farmers were illiterates.

4.3.3 Farming experience

The data in Table 5 and Fig:6 revealed that, 53.33 per cent of demonstration and 48.33 per cent of non-demonstration farmers were belonged to medium experience category, followed by high experience (28.33% and 23.33%) and low experience category (18.33% and 28.33%), respectively.

4.3.4 Land holding

The distribution of respondents according to land holding from Table 5 and Fig:7)revealed that, 46.67 per cent of demonstration and 30.00 per cent of non-demonstration farmers were belonged to medium farmers category, followed by big farmers (33.33% and 25.00%), semi medium farmers (13.33% and 20.00%) and small farmers (6.67% and 16.67%) category. Whereas, none of the demonstration and meager (8.33%) per cent of the non-demonstration farmers were belonged to marginal farmer categories.

4.3.5 Annual income

The results from the Table 5 and Fig:8 indicated that, sixty five per cent of demonstration and 36.67 per cent of non-demonstration farmers were belonged to high income category, followed by medium income (23.33% and 28.33%) and semi medium income category (8.33% and 15.00%). Whereas, 3.33 per cent of demonstration farmers and 20.00 per cent of non-demonstration farmers were belonged to low income categories.

Table 5: Distribution of the respondents according to their personal, socio-economic and psychological characteristics

n=120

Sl. No.	Characteristics	Demonstration farmers (n_1=60)		Non-demonstration farmers (n_2=60)	
		F	%	F	%
1.	**Age**				
1	Young (up to 30 yrs)	14	23.33	12	20.00
2	Middle (31 to 50 yrs)	36	60.00	28	46.67
3	Old age (>51 yrs)	10	16.67	20	33.33
2.	**Education**				
1	Illiterates	3	5.00	11	18.33
2	Primary (1-4th)	4	6.67	10	16.67
3	Middle (5th -7th)	7	11.67	14	23.33
4	High school (8th -10th)	21	35.00	15	25.00
5	College (11th -12th)	15	25.00	8	13.33
6	Graduate (12th & above)	10	16.67	2	3.33
3.	**Farming experience**				
1	Low (Mean- 0.425SD)	11	18.33	17	28.33
2	Medium (Mean ± 0.425SD)	32	53.33	29	48.33
3	High (Mean + 0.425SD)	17	28.33	14	23.33
Mean		18.60		18.48	
SD		8.68		8.28	
4.	**Land Holding**				
1	Marginal Farmers (up to 2.5 acres)	0	0.00	5	8.33
2	Small Farmers (2.51 to 5.00 acres)	4	6.67	10	16.67
3	Semi Medium Farmers (5.01 to 10.00 acres)	8	13.33	12	20.00
4	Medium Farmers (10.01 to 25.00 acres)	28	46.67	18	30.00
5	Big Farmers (>25.00 acres)	20	33.33	15	25.00
5.	**Annual Income**				
1	High income (>51000)	39	65.00	22	36.67
2	Medium income (34001-51000)	14	23.33	17	28.33
3	Semi medium Income (17001-34000)	5	8.33	9	15.00
4	Low income (up to 17000)	2	3.33	12	20.00

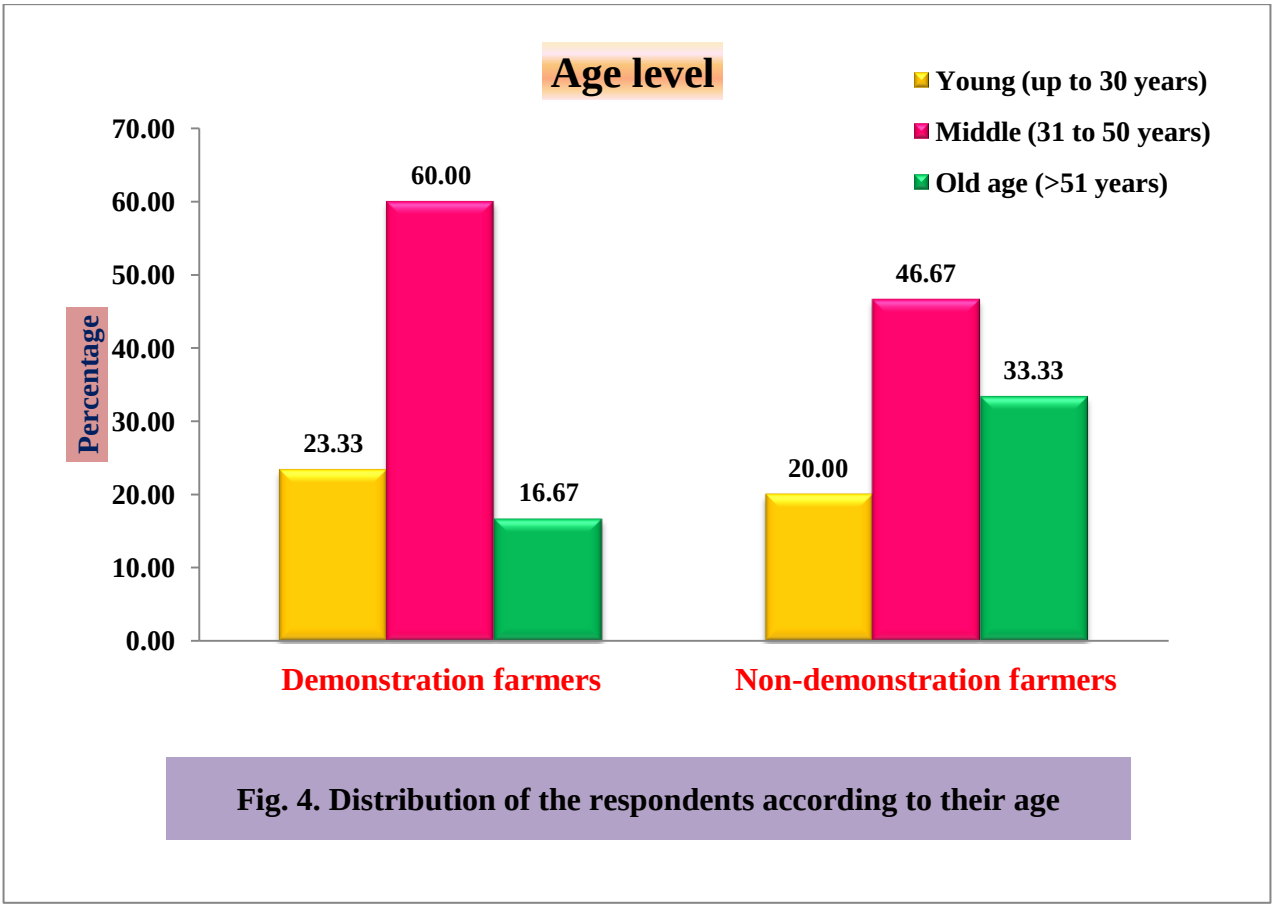


Fig. 4. Distribution of the respondents according to their age

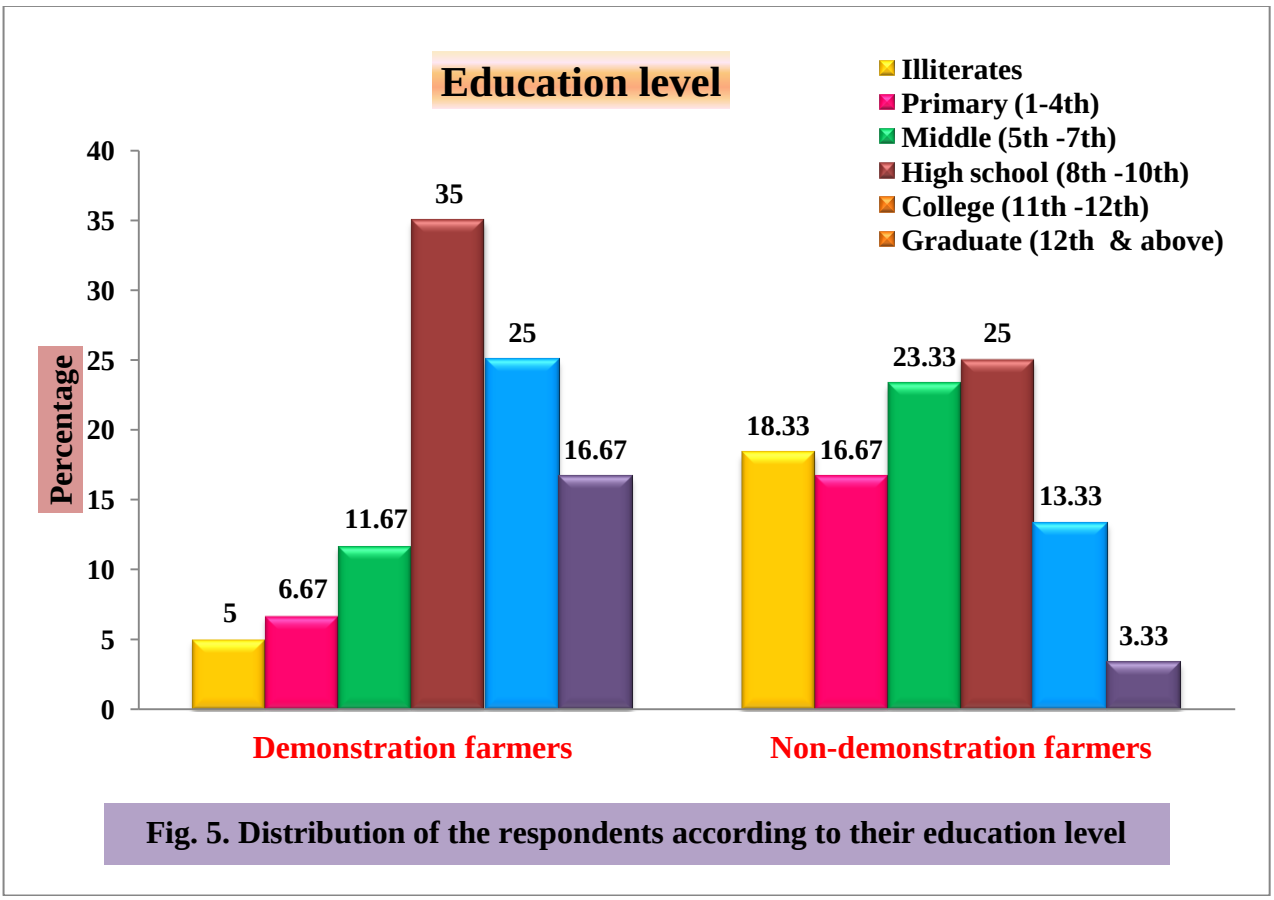


Fig. 5. Distribution of the respondents according to their education level

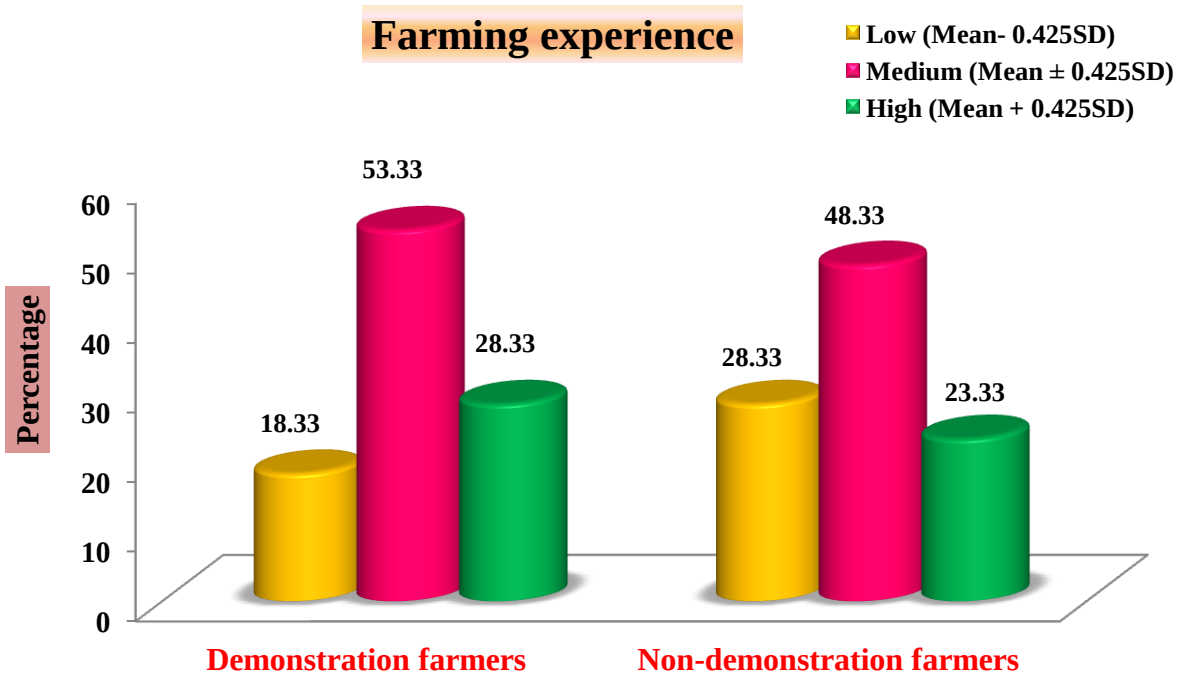


Fig. 6. Distribution of the respondents according to their farming experience

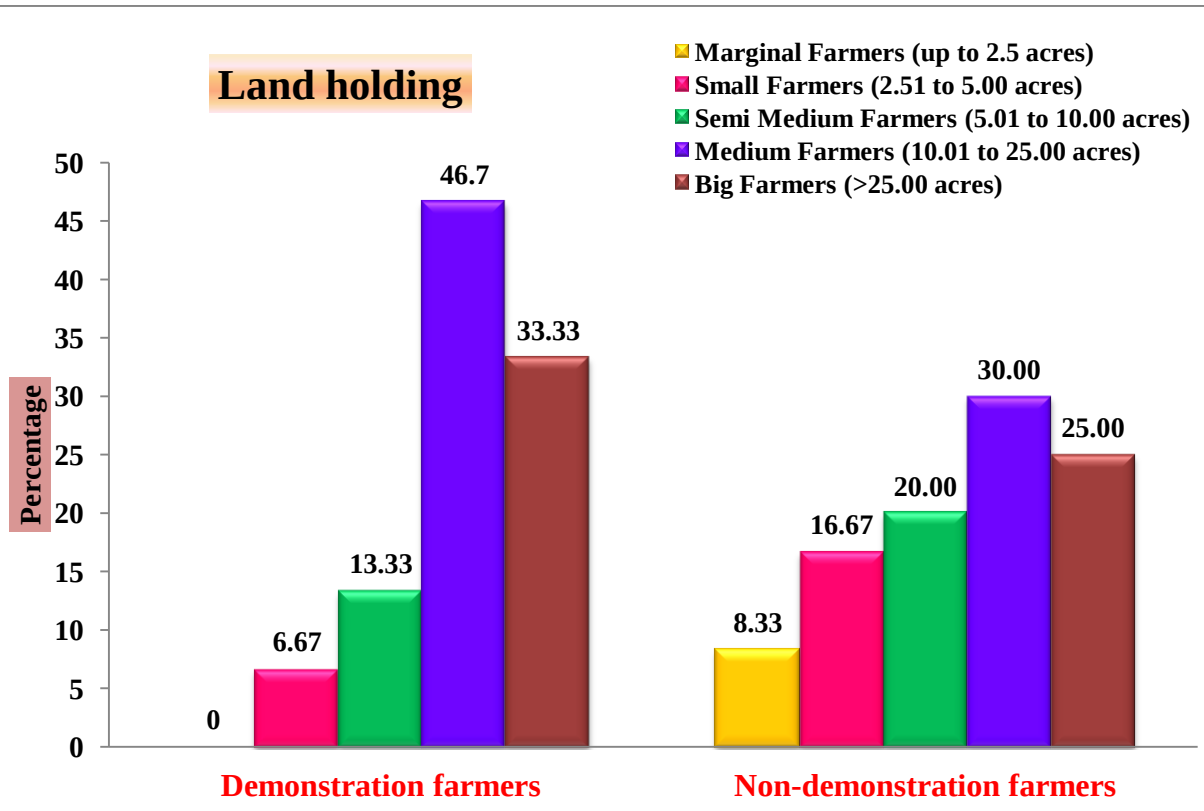


Fig. 7. Distribution of the respondents according to their land holding

4.3.6 Innovativeness

It is noticed in Table 5 and Fig: 9 that, the medium innovativeness was exhibited by fifty five per cent of demonstration farmers and thirty five per cent of non-demonstration farmers while 33.33 per cent of demonstration farmers and 20.00 per cent of non-demonstration farmers had high level of innovativeness. However, low innovativeness was noticed in 11.67 per cent of demonstration farmers and 45.00 per cent of non-demonstration farmers.

4.3.7 Risk orientation

The data in Table 5 and Fig: 10 revealed that, 56.67 per cent of demonstration farmers and 30.00 per cent of non-demonstration farmers were belonged to medium risk orientation category, whereas, 26.67 per cent of demonstration farmers and 11.67 per cent of non-demonstration farmers were belonged to high level of risk orientation category. While, 16.67 per cent of demonstration farmers and 37.50 per cent of non-demonstration farmers were belonged to low level of risk orientation category.

4.3.8 Achievement motivation

The analysis of the results presented in Table 5 and Fig: 11 revealed that, 51.67 per cent of demonstration farmers and 28.33 per cent of non-demonstration farmers were belonged to medium achievement motivation category. Whereas 31.67 per cent of demonstration farmers and 16.67 per cent of non-demonstration farmers were belonged to high achievement motivation category, followed by 16.67 per cent of demonstration farmers and fifty five per cent of non-demonstration farmers were belonged to low achievement motivation category.

4.3.9 Scientific orientation

The analysis of the results presented in Table 5 and Fig: 12 revealed that, 43.33 per cent of demonstration farmers and 35.00 per cent of non-demonstration farmers were belonged to medium scientific orientation category. Whereas thirty five per cent of demonstration farmers and fifteen per cent of non-demonstration farmers were belonged to high scientific orientation category, followed by 21.67 per cent of demonstration and fifty per cent of non-demonstration farmers were belonged to low scientific orientation category.

4.3.10 Mass media utilization

The data presented in Table 5 and Fig: 13 revealed that, 41.67 per cent of demonstration farmers and 28.33 per cent of non-demonstration farmers were belonged to

Sl. No.	Characteristics	Demonstration farmers (n_1=60)		Non-demonstration farmers (n_2=60)	
		F	%	F	%
1.	**Innovativeness**				
1	Low (Mean- 0.425SD)	7	11.67	27	45.00
2	Medium (Mean ± 0.425SD)	33	55.00	21	35.00
3	High (Mean + 0.425SD)	20	33.33	12	20.00
Mean		17.68		15.23	
SD		1.72		2.38	
2.	**Risk orientation**				
1	Low (Mean- 0.425SD)	10	16.67	35	58.33
2	Medium (Mean ± 0.425SD))	34	56.67	18	30.00
3	High (Mean + 0.425SD)	16	26.67	7	11.67
Mean		4.13		2.68	
SD		1.02		1.08	
3.	**Achievement motivation**				
1	Low (Mean- 0.425SD)	10	16.67	33	55.00
2	Medium (Mean ± 0.425SD)	31	51.67	17	28.33
3	High (Mean + 0.425SD)	19	31.67	10	16.67
Mean		7.28		5.85	
SD		1.24		1.64	
4.	**Scientific orientation**				
1	Low (Mean- 0.425SD)	13	21.67	30	50.00
2	Medium (Mean ± 0.425SD)	26	43.33	21	35.00
3	High (Mean + 0.425SD)	21	35.00	9	15.00
Mean		9.20		4.90	
SD		1.02		1.59	
5.	**Mass media utilization**				
1	Low (Mean- 0.425SD)	15	25.00	28	46.67
2	Medium (Mean ± 0.425SD)	25	41.67	17	28.33
3	High (Mean + 0.425SD)	20	33.33	15	25.00
Mean		9.23		5.88	
SD		3.9		3.59	

F-Frequency
%-Percentage

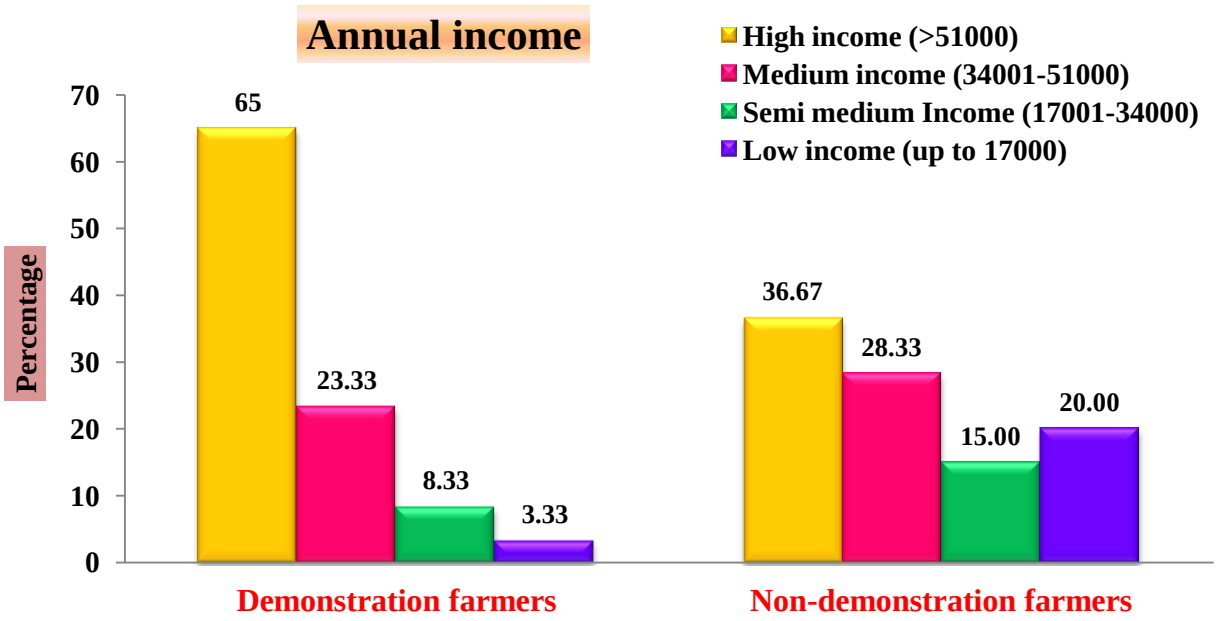


Fig. 8. Distribution of the respondents according to their annual income

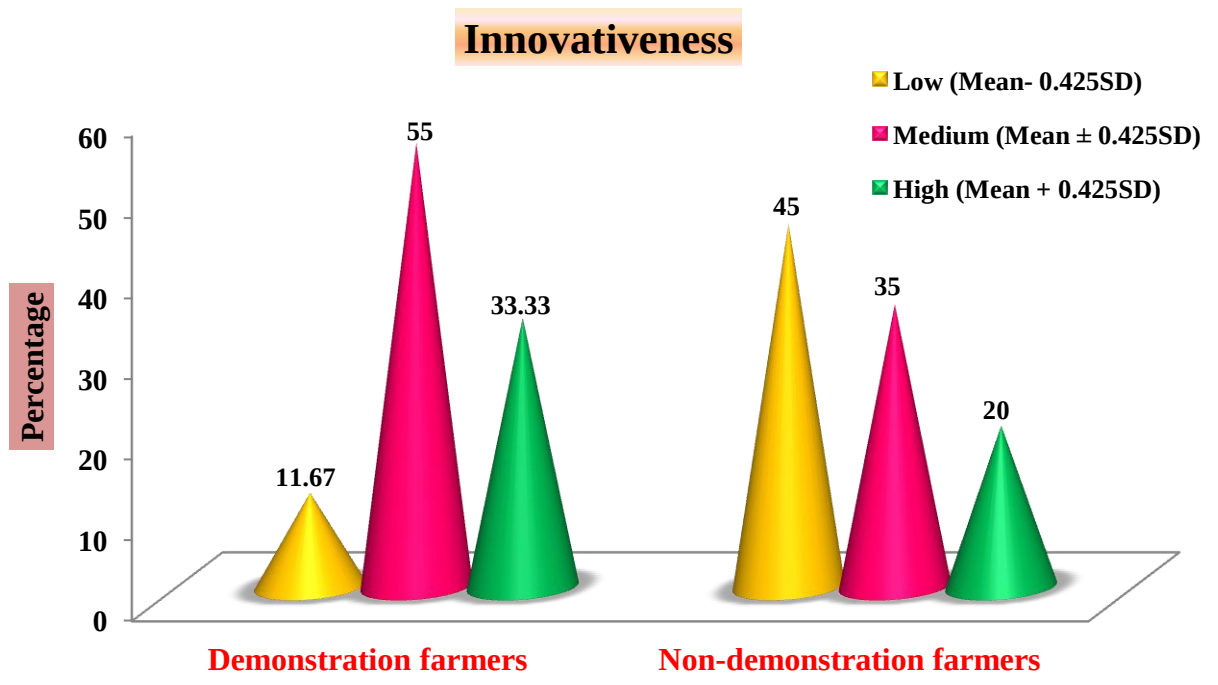


Fig. 9. Distribution of the respondents according to their innovativeness

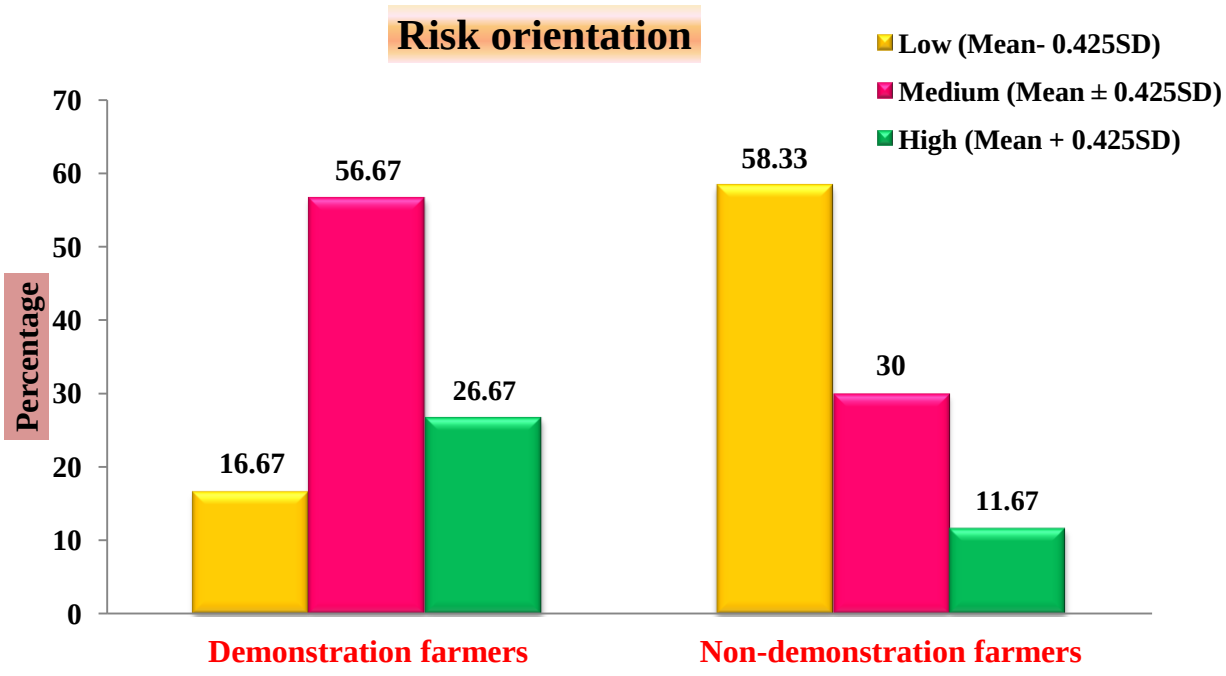


Fig. 10. Distribution of the respondents according to their risk orientation

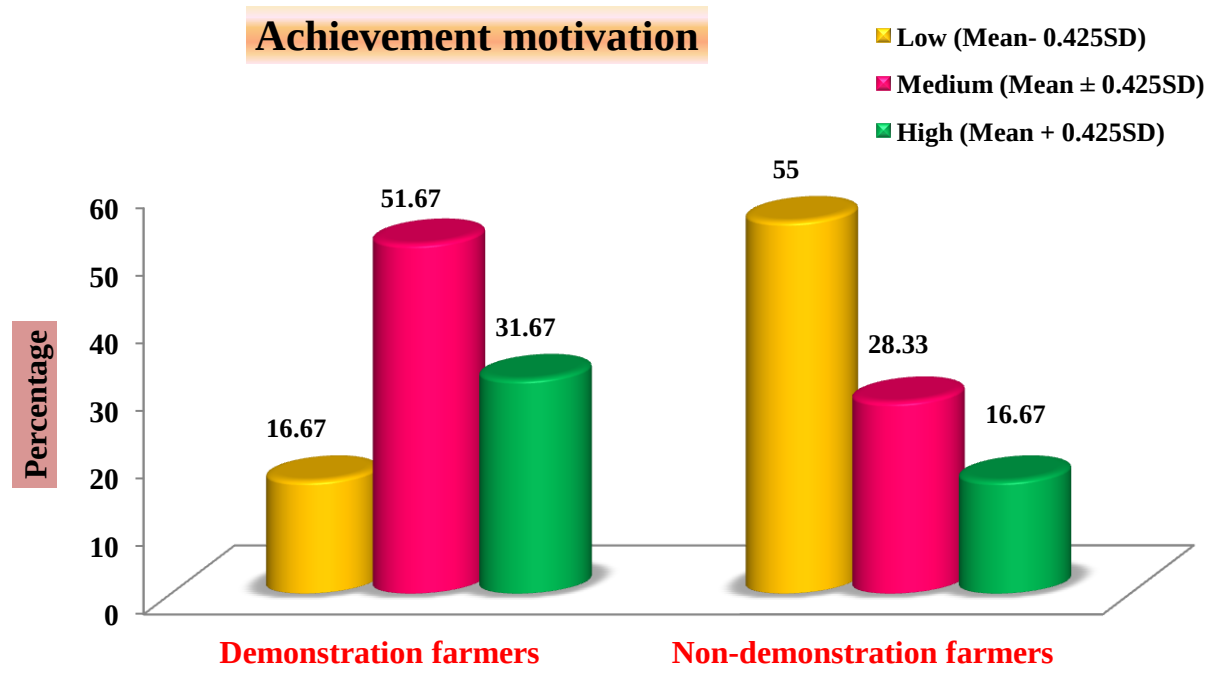


Fig. 11. Distribution of the respondents according to their achievement motivation

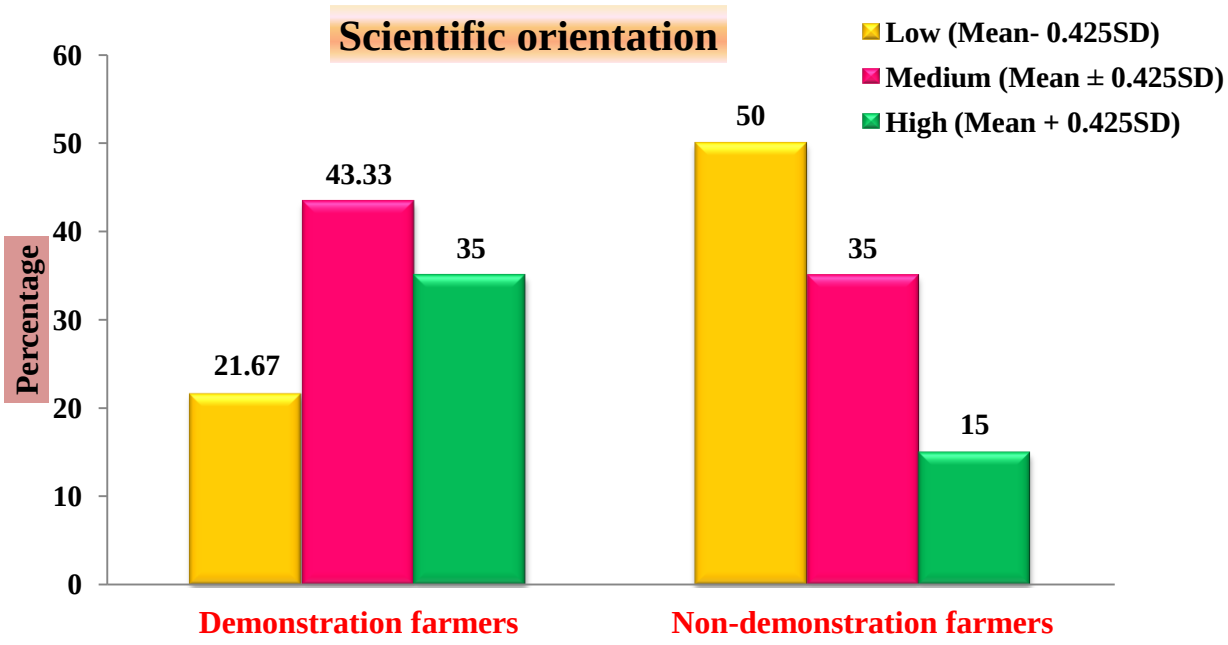


Fig. 12. Distribution of the respondents according to their scientific orientation

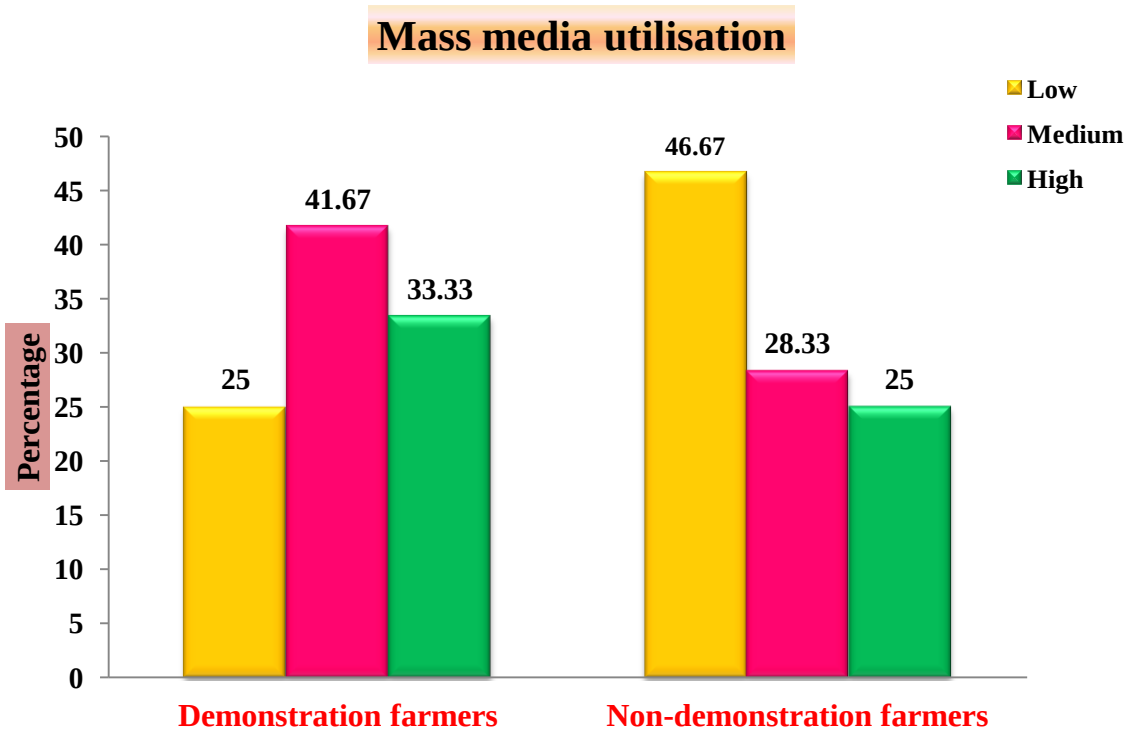


Fig. 13. Distribution of the respondents according to their mass media utilization

medium mass media utilization category. Whereas 33.33 per cent of demonstration farmers and 25.00 per cent of non-demonstration farmers were belonged to high mass media utilization category, followed by 25.00 per cent of demonstration and 46.67 per cent of non-demonstration farmers were belonged to low mass media utilization category.

4.3.11 Extension participation

It is noticed from Table 6 and Fig:14 that, majority (73.33%) of demonstration farmers regularly participated in demonstrations followed by 61.67 and 56.67 per cent of demonstration farmers participated in training and field day regularly. Fifty per cent of demonstration farmers regularly participated in krishimela. More than fifty (51.67%) per cent of demonstration farmers participated in extension meeting and group discussion occasionally. Nearly, half (46.67% and 43.33%) of demonstration farmers participated in field visit and educational tour occasionally, respectively.

Further, fifty five per cent of non-demonstration farmers participated in group discussion and 51.67 per cent of farmers participated in krishimela occasionally. However majority of non-demonstration farmers never participated in educational tour (75.00%), followed by demonstrations (70.00%), training (68.73%), field day (60.00%) and field visit (58.33%), respectively. Whereas fifty and fourty per cent of non-demonstration farmers never and occasionally participated in extension meeting, respectively.

4.3.12 Sources of information

The data in Table 7 and Fig:15 revealed that, majority of demonstration farmers consulted agricultural university SMS (83.33%), followed by Progressive Farmers (70.00%), Agricultural Assistant (65.00%), Assistant Agricultural Officers (63.33%), Private Agency Extension Officer (58.33%), Neighbours (53.33%), Television viewing (51.67%), News Paper reading (50.00%), Agricultural Officer (41.67%), Relatives (36.67%) and Assistant Director of Agriculture (33.33%). Whereas less per cent of the farmers have got information from Radio listening (28.33%) and Farm Magazine reading (25.00%).

In case of non-demonstration farmers' majority of farmers consulted Progressive farmers (66.67%). Fifty per cent farmers consulted Neighbours. Less than fifty per cent of non-demonstration farmers have consulted Agricultural Assistant (48.33%) followed by Assistant Agricultural Officers (45.00%), Agricultural University SMS (43.33%), Private Agency Extension Officer (41.67%), Television viewing (40.00%), News Paper reading (33.33%), Relatives (31.67%), Agricultural Officer (25.00%), Radio listening (20.00%), and Assistant Director of Agriculture respectively. A least number of farmers (8.33%) of farmers have consulted Farm Magazine reading.

Table 6: Distribution of the respondents according to their extension participation

n=120

Sl. No.	Category	Demonstration farmers (n_1= 60)						Non-demonstration farmers (n_2= 60)					
		Regular		Occasional		Never		Regular		Occasional		Never	
		F	%	F	%	F	%	F	%	F	%	F	%
a)	Training	37	61.67	14	23.33	9	15.00	5	8.33	14	23.33	41	68.33
b)	Extension meeting	27	45.00	31	51.67	2	3.33	6	10.00	24	40.00	30	50.00
c)	Demonstrations	44	73.33	16	26.67	0	0.00	10	16.66	8	13.33	42	70.00
d)	Krishimela	30	50.00	23	38.33	7	11.67	16	26.67	31	51.67	13	21.67
e)	Field day	34	56.67	19	31.67	7	11.67	8	13.33	16	26.67	36	60.00
f)	Field visit	21	35.00	28	46.67	11	18.33	5	8.33	20	33.33	35	58.33
g)	Group discussion	20	33.33	31	51.67	9	15.00	5	8.33	33	55.00	22	36.67
h)	Educational tour	19	31.67	26	43.33	15	25.00	4	6.67	11	18.33	45	75.00

F-Frequency

%-Percentage

Table7. Distribution of respondents according to their sources of information consulted

n=120

Sl. No.	Sources of information	Demonstration farmers (n_1=60)					Non-Demonstration farmers (n_2=60)				
		Consulted		Not Consulted		Rank	Consulted		Not Consulted		Rank
		F	%	F	%		F	%	F	%	
1.	Agricultural assistant	39	65.00	21	35.00	III	29	48.33	31	51.67	III
2.	Assistant agricultural officers	38	63.33	22	36.67	IV	27	45.00	33	55.00	IV
3.	Agricultural officer	25	41.67	35	58.33	IX	15	25.00	45	75.00	X
4.	Assistant Director of agriculture	20	33.33	40	66.67	XI	10	16.67	50	83.33	XII
5.	Agricultural university SMS	50	83.33	10	16.67	I	26	43.33	34	56.67	V
6.	Private agency extension officer	35	58.33	25	41.66	V	25	41.67	35	58.33	VI
7.	Progressive farmers	42	70.00	18	30.00	II	40	66.67	20	33.33	I
8.	Neighbours	32	53.33	28	46.67	VI	30	50.00	30	50.00	II
9.	Relatives	22	36.67	38	63.33	X	19	31.67	41	68.33	IX
10.	Radio	17	28.33	43	71.67	XII	12	20.00	48	80.00	XI
11.	News paper	30	50.00	30	50.00	VIII	20	33.33	40	66.67	VIII
12.	Farm magazine	15	25.00	45	75.00	XIII	5	8.33	55	91.67	XIII
13.	Television	31	51.67	29	48.33	VII	24	40.00	33	55.00	VII

F = Frequency
% = Percentage

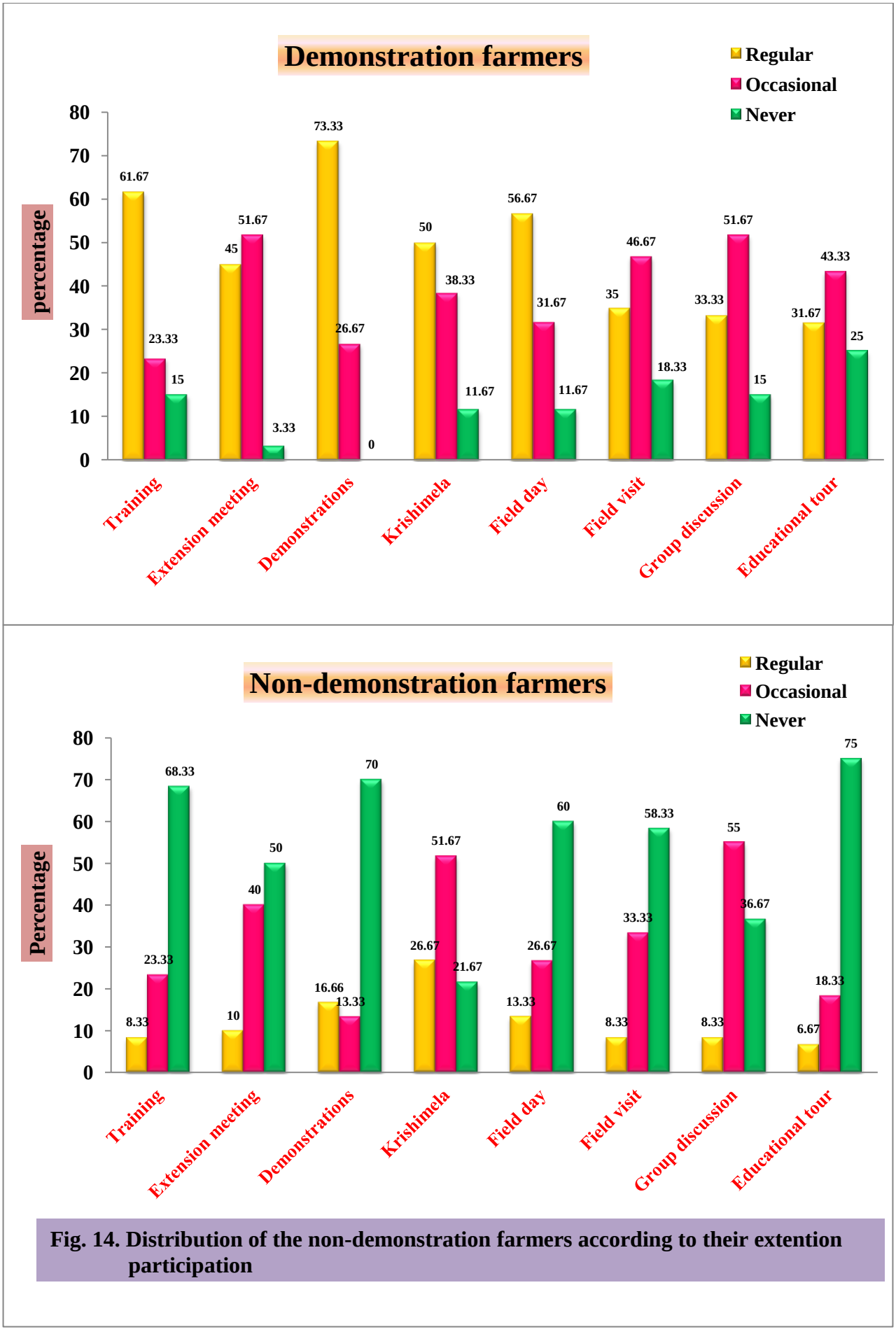
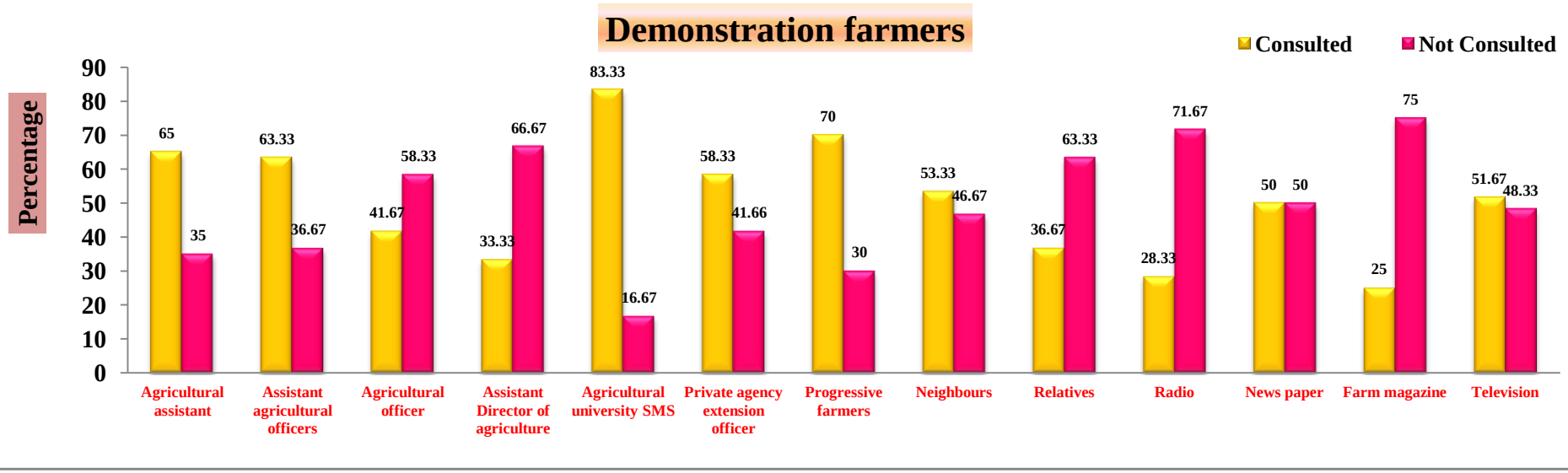


Fig. 14. Distribution of the non-demonstration farmers according to their extention participation



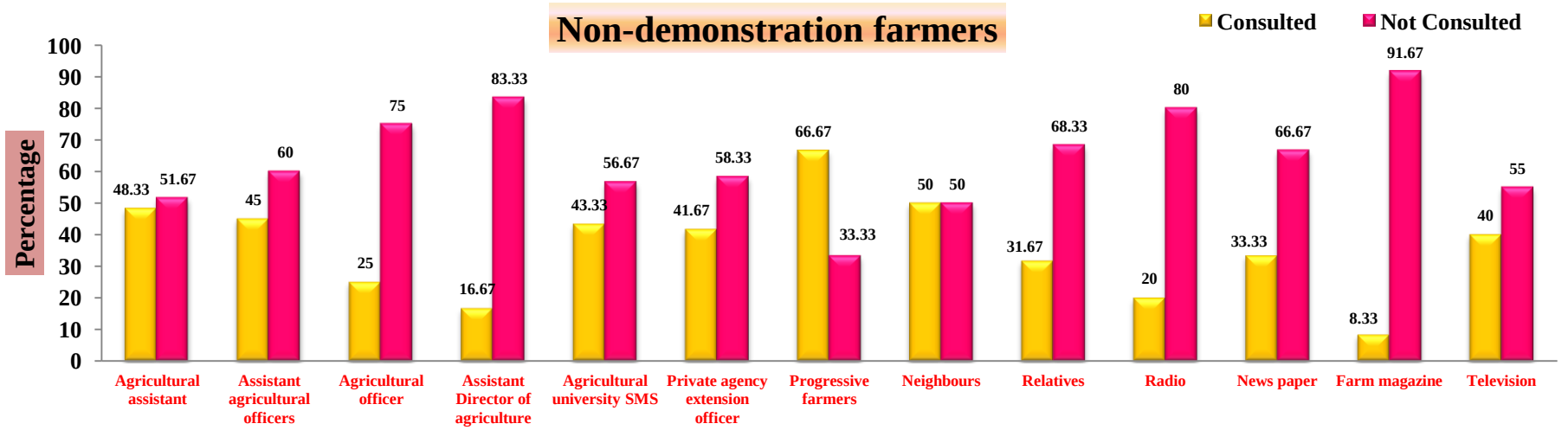


Fig.15. Distribution of the respondents according to their sources of information consultancy

4.4 Relationship between selected independent variables of the respondents with their knowledge and adoption level

4.4.1 Relationship between selected independent variables of the respondents with their knowledge level

The results in the Table 8 indicated that, independent variables of demonstration farmers *viz.*, education, farming experience, land holding, extension participation, mass media utilization, risk orientation, achievement motivation and scientific orientation exhibited positive and significant relationship at 0.05 level of probability, whereas sources of information and innovativeness showed positive and significant relationship at 0.01 level of probability. The remaining two variables namely, age and annual income exhibited non-significant relationship with knowledge level of demonstration farmers.

In case of the non-demonstration farmers the independent variables i.e. education, farming experience, land holding, extension participation, mass media utilization, innovativeness, risk orientation, achievement motivation and scientific orientation exhibited positive and significant relationship at 0.05 level of probability, whereas, sources of information showed positive and significant relationship at 0.01 level of probability. The remaining two variables namely, age and annual income exhibited positive and non-significant relationship with knowledge level of non-demonstration farmers.

4.4.2 Relationship between selected independent variables of the respondents with their adoption level

The results in the Table 9 indicated that, independent variables demonstration farmers *viz.*, education, land holding, annual income, extension participation, mass media utilization, risk orientation and achievement motivation exhibited positive and significant relationship at 0.05 level of probability, whereas sources of information, innovativeness and scientific orientation showed positive and significant relationship at 0.01 level of probability. The remaining two variables namely, age and farming experience exhibited non-significant relationship with adoption level of demonstration farmers.

In case of non-demonstration farmers the independent variables i.e. education, land holding, annual income, extension participation, mass media utilization, risk orientation, achievement motivation and scientific orientation exhibited positive and significant relationship at 0.05 level of probability, whereas sources of information showed positive and significant relationship at 0.01 level of probability. The remaining variables namely age, farming experience and innovativeness exhibited positive and non-significant relationship with adoption level of non-demonstration farmers.

Table 8: Relationship between selected independent variables of the respondents with their knowledge level

n=120

Sl.No.	Independent variables	Demonstration farmers (n_1=60)	Non-Demonstration farmers (n_2=60)
		'r' value	'r' value
1	Age	0.095^{NS}	0.90^{NS}
2	Education	0.239*	0.248*
3	Farming Experience	0.265*	0.231*
4	Land Holding	0.286*	0.290*
5	Annual Income	0.162^{NS}	0.196^{NS}
6	Innovativeness	0.323**	0.296*
7	Risk Orientation	0.221*	0.210*
8	Achievement Motivation	0.248 *	0.255*
9	Scientific Orientation	0.296*	0.278*
10	Mass Media Utilization	0.243*	0.269*
11	Extension Participation	0.259*	0.282*
12	Sources of Information	0.410**	0.334**

** - significant at 1 per cent
* - significant at 5 per cent
NS – Non significant

Table 9: Relationship between selected independent variables of the respondents with their adoption level

n=120

Sl.No.	Independent variables	Demonstration farmers (n_1=60)	Non-Demonstration farmers (n_2=60)
		'r' value	'r' value
1	Age	0.120^{NS}	0.100^{NS}
2	Education	0.282*	0.220*
3	Farming Experience	0.181^{NS}	0.120^{NS}
4	Land Holding	0.279*	0.230*
5	Annual Income	0.229*	0.210*
6	Innovativeness	0.453**	0.116 ^{NS}
7	Risk Orientation	0.241*	0.227*
8	Achievement Motivation	0.263*	0.250*
9	Scientific Orientation	0.324**	0.295*
10	Mass Media Utilization	0.265*	0.209*
11	Extension Participation	0.278*	0.215*
12	Sources of Information	0.415**	0.355**

** - significant at 1 per cent
* - significant at 5 per cent
NS - Non significant

4.5 Constraints faced by the respondents in adoption of transplanting method of redgram cultivation practices

Demonstration farmers

The data presented in the Table 10 and Fig: 16 revealed that, the foremost constraints were 78.33 per cent cited low prices to the produce, followed by non availability of labour (75.00%), high cost of cultivation practices (66.67%) and pest management problem (60.00%). Fifty per cent of farmers had constraints of nursery management practices. While, less than half per cent of farmers had constraints of lack of irrigation water (41.67%), high wages of labours (33.33%) and disease management problem (23.33%).

Non-Demonstration farmers

It was observed from the data presented in Table11 and Fig: 17 that, majority of non-demonstration farmers were expressed that, high cost of cultivation practices (81.67%) and lack of irrigation water (73.33%). While, 63.33, 60.00, 53.33 and 51.67 per cent farmers had constraints of non-availability of labours, lack of awareness, low price to the product and lack of knowledge, respectively. And fifty and 38.33 per cent of farmers were expressed that, pest and disease management problem, respectively.

4.6 Cost and returns of transplanting method of redgram production

Yield per acre

It could be observed from the Table 12 that, 41.66 per cent of demonstration farmers obtained yield of more than 10 quintals per acre followed by 33.33 per cent of them obtained yield in the range of 9 to 10 quintals per acre and only 25.00 per cent of demonstration farmers obtained less than 9 quintals per acre.

In case of non-demonstration farmers 36.66 per cent of them obtained yield of more than 6 quintals per acre. While, 35.00 per cent of them obtained yield in the range of 5 to 6 quintals per acre and 28.33 per cent of them obtained yield of less than 5 quintals per acre.

Cost per acre

The results presented in table 12 indicated that, cost per acre of transplanting redgram production, which was Rs. 11000-11500 in case of fourty per cent of demonstration farmers, while it was less than Rs. 11000 in case of 36.67 per cent of demonstration farmers and more than Rs.11500 in case of 23.33 per cent of demonstration farmers.

While, regarding non-demonstration farmers 43.33 per cent of farmers cost was in the range of Rs. 6500-7000, whereas, thirty per cent of them it was less than Rs. 6500 and only 26.67 per cent of them it was more than Rs. 7000.

Table 10: Constraints faced by the demonstration farmers in adoption of transplanting method of redgram cultivation

n=60

Sl. No.	Constraints	Demonstration farmers	
		F	%
1	Non availability of labours	45	75.00
2	High wages of labours	20	33.33
3	Lack of irrigation water	25	41.67
4	Nursery management problem.	30	50.00
5	Pest management problem	36	60.00
6	Disease management problem	14	23.33
7	High cost of cultivation practices	40	66.67
8	Low price to the product	47	78.33

F-Frequency
%-Percentage

Table 11: Constraints faced by the non-demonstration farmers in adoption of transplanting method of redgram cultivation

n=60

Sl. No	Constraints	Non-Demonstration farmers	
		F	%
1	Lack of awareness	36	60.00
2	Lack of knowledge	31	51.67
3	Non availability of labours	38	63.33
4	Lack of irrigation water	44	73.33
5	Pest management problem	30	50.00
6	Disease management problem	23	38.33
7	High cost of cultivation practices	49	81.67
8	Low price to the product	32	53.33

F-Frequency
%-Percentage

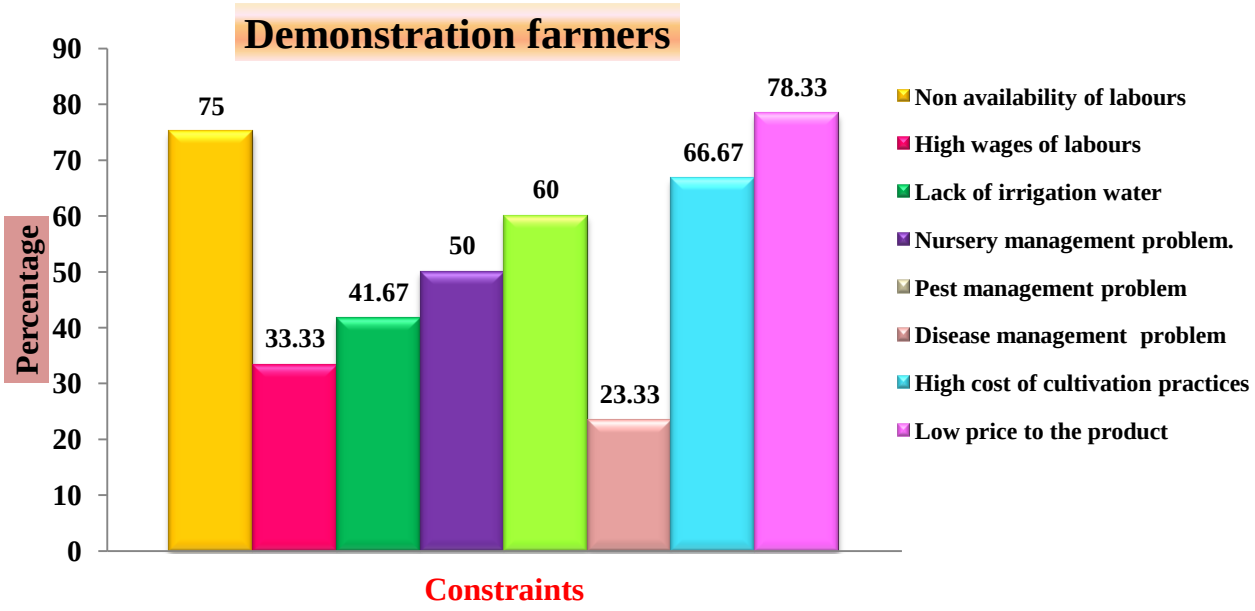


Fig. 16. Constraints faced by the demonstration farmers in adoption of transplanting method of redgram cultivation

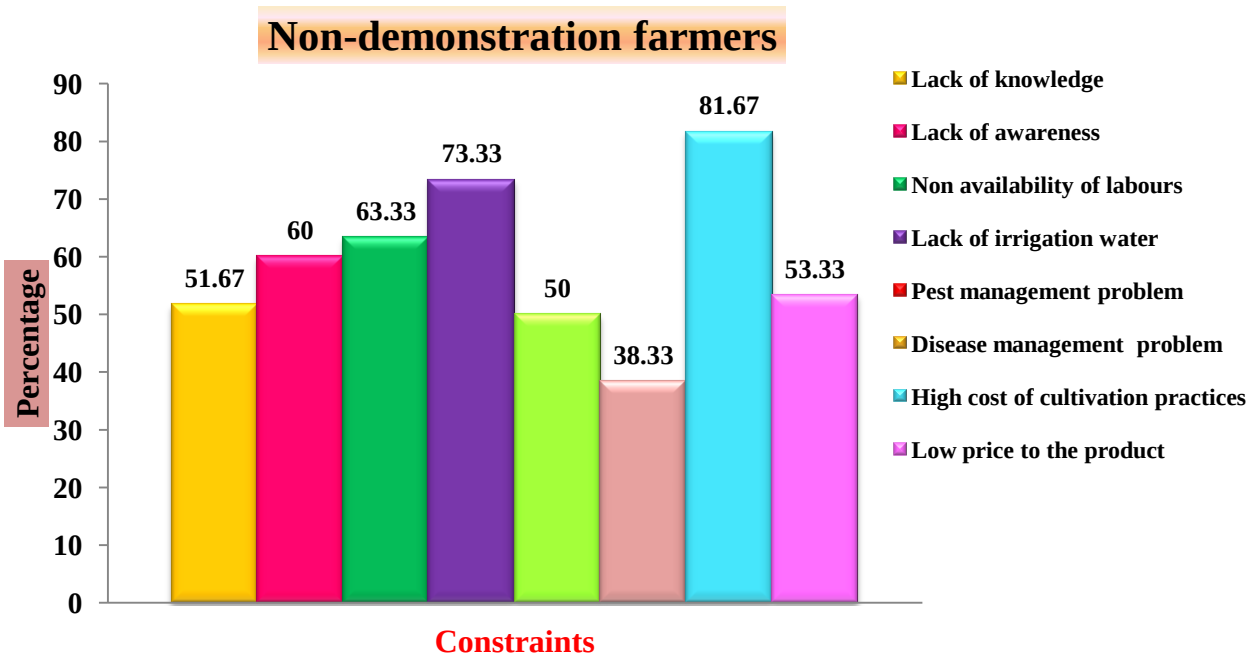


Fig. 17. Constraints faced by the non-demonstration farmers in adoption of transplanting method of redgram cultivation

Profit per acre

The data from the table 12 revealed that, 46.67 per cent of demonstration farmers obtained the profit in the range of Rs. 20000-23000, whereas, 28.33 per cent of them obtained the profit more than Rs. 23000 and 25 per cent of them obtained the profit less than Rs. 20000.

In case of non-demonstration farmers 38.33 per cent of them were obtained the profit in the range of Rs. 6000-8000. While, 33.33 per cent of them obtained the profit less than Rs.6000 and only 28.33 per cent of farmers were obtained profit of more than Rs. 8000.

BC ratio

It is crystal clear from the Table 12 that, the demonstration farmers had the benefit cost ratio of 1:3.02 on the contrary the non-demonstration farmers had Benefit Cost ratio of 1:2.05.

Table 12. Cost and return of transplanting method of redgram production

n=120

Demonstration farmers (n_1=60)			**Non Demonstration farmers (n_2=60)**		
Particulars	**Frequency**	**Percentage**	**Particulars**	**Frequency**	**Percentage**
Yield/acre			**Yield/acre**		
<9quintals	15	25.00	**<5 quintals**	17	28.33
9-10quintals	20	33.33	**5-6 quintals**	21	35.00
> 10 quintals	25	41.66	**> 6 quintals**	22	36.66
Cost/acre			**Cost/acre**		
< Rs 11000	22	36.67	**< Rs 6500**	18	30.00
Rs 11000-11500	24	40.00	**Rs 6500-7000**	26	43.33
>Rs 11500	14	23.33	**>Rs 7000**	16	26.67
Profit/acre			**Profit/acre**		
< Rs 20000	15	25.00	**< Rs 6000**	20	33.33
Rs 20000 – 23000	28	46.67	**Rs 6000-8000**	23	38.33
>Rs 23000	17	28.33	**>Rs 8000**	17	28.33
B:C Ratio	**3.02**		**B:C Ratio**	**2.05**	

F-Frequency **%-Percentage**

Discussion

V. DISCUSSION

The results of the present study were discussed in this chapter under the following heads.

5.1 Knowledge level of the respondents with respect to transplanting method of redgram cultivation practices

5.2 Adoption level of the respondents with respect to transplanting method of redgram cultivation practices

5.3 Personal, socio-economic and psychological characteristics of the respondents

5.4 Relationship between selected independent variables of the respondent with their knowledge and adoption level

5.5 Constraints faced by the respondents in adoption of transplanting method of redgram cultivation practices

5.6 Cost and return of transplanting method of regram production

5.1 Knowledge level of the demonstration and non-demonstration farmers with respect to transplanting method of redgram cultivation practices

5.1.1 Overall knowledge level of respondents

The overall knowledge level of demonstration farmers presented in Table 1 indicated that major proportion of farmers were laying from medium to high knowledge category (81.67%), while meager (18.33%) per cent of farmers were belonged to the low knowledge categories. In case of the non-demonstration farmers major proportion of farmers were laying from low to medium knowledge category (78.33%), while only 21.67 per cent of non-demonstration farmers were belonged to the high knowledge category.

Here the demonstration farmers had more knowledge compared to non-demonstration farmers, because majority of demonstration farmers were actively participated in demonstrations conducted by KVK in addition to more sources of information consulted from subject matter specialist. These factors might have contributed more for possession of higher knowledge of transplanting method of redgram cultivation practices by demonstration farmers. The results are in line with the findings of Kharatmol (2006) and Raghavendra (2010).

5.1.2 Knowledge level of the respondents about the individual practices of transplanting method of redgram cultivation

An appraisal of Table 2 revealed that, with respect to nursery management practices all the demonstration farmers had knowledge about the recommended variety, deep black soil as best suited for transplanting method and recommended seed rate. Majority of demonstration farmers had knowledge about age of the seedling and two seeds are placed in per polythene bag for (88.33%) followed by materials used for filling the polythene bag and two times daily watering to the seedlings (85.00%), size of the polythene bag (83.33%), thinning practice (81.67%) and seed treatment (76.67%).

With respect to main field management practices cent per cent of demonstration farmers had knew the correct time for transplanting. Ninety per cent of demonstration farmers had knowledge about the depth of pit in main field, one seedling transplant per pit, nipping practices and recommended yield. Majority of farmers had knew the inter cultivation practices (88.33%) followed by irrigation of water (86.67%), aware of pod borer pest and intercrop (85.00%), recommended spacing and quantity of FYM application (83.33%), number of plants per acre (81.67%), aware of wilt diseases (80.00%), summer ploughing for field preparation (76.67%), time of FYM application (75.00%), pest control (70.00%). Over fifty per cent of farmers had knowledge about recommended dose of fertilizer application (66.67%) followed by use of growth regulator (65.00%), disease control (63.33%) and gypsum application (61.67%).

The possible reason for the demonstration farmers to be medium to higher knowledge about the almost all transplanting method of cultivation practices might be the fact that, participated in demonstration conducted and training given by KVK has created a positive impact on the knowledge level of demonstration farmers about practices of transplanting method of redgram cultivation. The knowledge obtained through the participation in demonstration conducted and training provided by KVK was significant and had positive relationship with demonstration farmers about improved practices of transplanting method of redgram cultivation, which clearly indicates that demonstration and training improves the knowledge level of the demonstration farmers about transplanting method of redgram cultivation practices.

In addition to the other reasons which could have contributed to higher knowledge level may be the high level of education of demonstration farmers, their high extent of extension

participation, high level of sources of information from agricultural university SMS consultancy and exposed to high level of mass media utilization in addition to higher per cent of scientific orientation and achievement motivation which might have contributed to their higher knowledge level about the individual practices of transplanting method of redgram cultivation.

An appraisal of Table 2 revealed that with regard to nursery management practices of non- demonstration farmers most of the farmers (91.67%) expressed that deep black soil as a best suited for transplanting method. Majority (75.00%) of them had known the recommended variety. More than fifty per cent of the farmers had knowledge about recommended seed rate and age of the seedling for transplanting. Fifty per cent of farmers had knowledge about materials used for filling the polythene bag and thinning practice. Less than fifty per cent of farmers had knowledge about seed treatment, size of the polythene bag, two seeds are placed in per polythene bag and two times daily watering to the seedlings.

In case of non-demonstration farmers with regard to main field management practices majority of the farmers had knowledge about correct time for transplanting and quantity of FYM application. Over fifty per cent of farmers had knowledge about irrigation, intercultivation practices, recommended yield, time of FYM application, nipping practices, aware of pod borer and wilt disease and intercrop. Fifty per cent of farmers had known the pest management. Less than fifty per cent of farmers had knowledge about depth of pit in main field followed by recommended dose of fertilizer application, disease control, recommended spacing, total number of plants per acre, gypsum application and use of growth regulator.

The possible reason for the non-demonstration farmers to be lower knowledge about the almost all transplanting method of cultivation practices might be the fact that, majority of farmers had lack of awareness, low education level, less participation in extension activities, less exposed to mass media utilization, less sources of information consultancy, also majority of the farmers were found to have low scientific orientation and achievement motivation. Hence non-demonstration farmers had low level knowledge about the transplanting method of redgram cultivation practices when compare with demonstration farmers. The results are in line with the findings of Raghavendra (2010).

5.2 Adoption level of the demonstration and non-demonstration farmers with respect to transplanting method of redgram cultivation practices

5.2.1 Overall adoption level of respondents

The results in Table 3 revealed that, major proportion of the demonstration farmers were laying from medium to high adoption category (78.33%), while, only 21.67 per cent of demonstration farmers were belonged to the low adoption categories.

In case of the non-demonstration farmers major proportion of farmers were laying from low to medium adoption category (80.00%), while only twenty per cent of non-demonstration farmers were belonged to the high adoption categories. Here the demonstration farmers have more adoption compared to other farmers. The possible reason for the above findings could be that, those practices which were easy to adopt and required less skill were fully adopted by the respondents. While those practices, which required more knowledge and skills were adopted by less number of respondents. Demonstration farmers have more skills compared to non-demonstration farmers. The other reason was active involvement in conduct of demonstrations by KVK has tempted the demonstration farmers to adopt majority of the practices of redgram cultivation under transplanting method. Further reason might be higher marginal returns and yield realized in redgram cultivation under transplanting method compared to conventional method of redgram cultivation.

The results are in line with the findings of Kharatmol (2006), Binkadakatti (2008) and Raghavendra (2010).

5.2.2 Adoption level of the respondents about individual practices of transplanting method of redgram cultivation

A perusal of the Table 4 depicted that, with respect to nursery management practices cent per cent of demonstration farmers had fully adopted recommended variety followed by recommended seed rate (83.33%), two seeds are placed in per polythene bag (80.00%), two times daily watering to the seedlings (70.00%), age of the seedling (68.33%), thinning practices (66.67%) and seed treatment (61.61%). whereas in case of non-demonstration farmers had fully adopted the nursery management practices like recommended variety (75.00%), recommended seed rate (60.00%), two seeds in per polythene bag (33.33%), two times daily watering to the seedlings (30.00%), age of the seedlings(50.00%), thinning practice (50.00%) and seed treatment (30.00%). However meager per cent of demonstration farmers were partially and not adopter category particularly in nursery management practices. Whereas meager per cent of non-

demonstration farmers were partial adopter category and it was interesting that around and less than fifty per cent of non-demonstration farmers had not adopted the majority of the nursery management practices.

Here the demonstration farmers had more adopted the nursery management practices when compare with non-demonstration farmers. The possible reasons of demonstration farmers had higher knowledge about individual practices of redgram transplanting, more consulted with subject matter specialist of KVK, higher portion of risk bearing ability, more exposed to mass media utilization and more participated in extension activities conducted by KVK. The results are in line with the findings of Binkadakatti (2008) and Raghavendra (2010).

In case of main field management practices with respect to demonstration farmers majority of them had fully adopted the practices like one seedling transplant per pit (83.33%) followed by nipping practices (81.67%), intercultivation (80.00%), transplanting time (76.67%), recommended spacing (68.33%), irrigation required (63.33%), recommended yield obtained (63.33%), intercrop (58.33%), dose of fertilizers application (53.33%), pest control (50.00%), disease control (48.33%), use of growth regulators (46.67%), gypsum application (45.00%) and quantity of FYM application (41.67%). Whereas in case of non-demonstration farmers had fully adopted the practices like one seedling transplant per pit (51.67%), nipping practices (51.67%), intercultivation (50.00%), time for transplanting (55.00%), recommended spacing (45.00%), irrigation required (36.67%), recommended yield obtained (48.33%), intercrop (41.67%), dose of fertilizers application (30.00%), pest control (41.67%), disease control (35.00%), use of growth regulators (33.33%) gypsum application (33.33%) and quantity of FYM application (40.00%).

About 15 to 20 per cent of demonstration farmers were partially adopter category with regard to almost all practices in main field management practices. While only 36.67 per cent of them had obtained the recommended yield in redgram cultivation under transplanting method. However more than 30.00 per cent of the demonstration farmers were non adopter category particularly in recommended dose of fertilizer application, gypsum application, use of growth regulator, pest and disease management and intercrop. Whereas 15 to 20 per cent of the demonstration farmers were not adopted the practices like quantity of FYM application, recommended spacing, transplanting seedlings as per recommended time, depth of pit in main field, one seedling per pit, irrigation required, inter cultivation practices and nipping practices.

Whereas around 15 to 20 per cent of non-demonstration farmers were partially adopted the almost all the main field management practices. However more than fifty per cent of the non-demonstration farmers had not adopted the practices like use of growth regulators (60.00%) followed by gypsum application (58.33%), disease management (58.33%) and recommended dose of fertilizer (56.67%). Fifty per cent of them were not adopted the pest management practices. Whereas less than fifty per cent of the non-demonstration farmers were not adopted the practices like one seedling per pit, intercrop, irrigation required, recommended yield obtained, quantity of FYM application and nipping practice. Whereas around thirty five per cent of the non-demonstration farmers belonged to non adopter category particularly in case of time for transplanting and recommended spacing and intercultivation.

It is well known fact that all improved practices cannot be adopted by all growers simultaneously with same degree. The adoption of farm practices is a complex process which needs mental thinking and executive power, responsibility as well as risk bearing ability. The probable reason for the more adoption of practices like use of improved seed variety, appropriate seed rate, spacing, and application of FYM could be that, easy availability, relatively low cost, compatibility and local availability.

Here the demonstration farmers had more adopted the individual practices of transplanting method of redgram cultivation when compared with non-demonstration farmers. The possible reasons of demonstration farmers had higher knowledge about individual practices of redgram transplanting, more consultation with subject matter specialist of KVK, higher portion of risk orientation, more exposed to mass media utilization and more participated in extension activities conducted by KVK.

The possible reasons of non-demonstration farmers having low level of knowledge, lack of awareness, lack of irrigation facilities, low risk orientation and low level achievement motivation. Further reasons might be due to less participation in extension activities, less exposing to mass media utilization and less consulting of sources of information. The results are in line with the findings of Binkadakatti (2008) and Raghavendra (2010).

5.3 Personal, socio-economic and psychological characteristics of the respondents

5.3.1 Age

The data presented in the Table 5 revealed that, majority (60.00%) of demonstration farmers and 46.67 per cent of non-demonstration farmers were belonged to the middle age group.

Usually farmers of middle age groups are enthusiastic and have more work efficiency than the younger and older ones. Further, individual of 31 to 50 years of age group have more family responsibility than young and old age groups. This might be the important reason to find majority of respondents in the age group of 31 to 50 years. The results are in line with the findings of Wase (2001), Raghunandan (2004) and Patil (2000).

5.3.2 Education

With regard to level of education from Table 5 revealed that, 35.00 per cent of the demonstration and 25.00 per cent of the non-demonstration respondents were educated up to high school, The education generally empowers the human being not only to understand the situation but also aware of problems and solutions to get out of the deprived situation. The findings were in conformity with the results of Patil (2000), Reddy (2006) and Raghavendra (2010).

5.3.3 Farming experience

It is revealed from the Table 5 depicted that, 53.33 per cent of demonstration and 48.33 per cent of non-demonstration farmers were belonged to medium experience category. The possible reason might be that majority of the respondent's belonged to middle age group. The other reason for majority of respondents belonged to medium experience because by birth farmers are being dependent on agriculture profession and also inherited culture of farmers from generation to generation to follow the traditional agricultural experience. These results were in line with the results of Raghavendra (2007) and Binkadakatti (2008).

5.3.4 Land holding

The distribution of respondents according to land holding from Table 5 revealed that, 46.67 per cent of demonstration farmers and 30.00 per cent of non-demonstration farmers were belonged to medium farmers category. The possible reason that could be attributed to this was these who had agriculture as the main occupation of the family, almost depend on their land for their living. So they always try to possess more acres of land. It could also be their ancestor's property. The other reason that could be attributed to this was those who had large holding, these farmers trying new technology practices in their some portion of land. The results were in line with the findings reported by Binkadakatti (2008).

5.3.5 Annual income

The results from the Table 5 indicated that, 65.00 per cent of demonstration and 36.67 per cent of non-demonstration farmers were belonged to high income category. The strong reason for this could be assured irrigation facility with the majority of the respondents. This would enable the farmers to cultivate more than one and diverse crops in a year earning better income. Subsidiary to agriculture, livestock husbandry was also followed as a source of supplementary income by majority respondents. The similar findings were reported by Raghavendra (2010).

5.3.6 Innovativeness

The data presented in Table 5 indicated that, 55.00 per cent of demonstration farmers belong to medium innovativeness category whereas 45.00 per cent of non-demonstration farmers belonged to low innovativeness category. Innovativeness of individual depends upon so many factors mainly education level, income, risk bearing ability. In present study majority of the demonstration farmers were high to medium degree of innovativeness compared to non-demonstration farmers had medium to low degree of innovativeness. The reason might the majority of the demonstration farmers had high education level, income and risk bearing ability compared to other farmers.

The results were in line with the results of Natikar (2001), Shashidhara (2003) and Suresh (2004), who found that majority of the respondents, had medium innovativeness. However, the above findings in contradiction with the findings of Vijaykumar (2001), that majority of the farmers had low innovativeness.

5.3.7 Risk orientation

The data in the Table 5 revealed that, 56.67 per cent of the demonstration farmers were belonged to medium risk orientation category, whereas, 58.33 per cent of non-demonstration farmers were belonged to low level of risk orientation category. The risk bearing capacity of individuals depend upon the personal, psychological, socio-economic characteristics. The individuals with more farming experience, better land holding, and better income had medium risk orientation. This is evident from the results that because contact with extension personnel by the respondents which might have increased the perception and confidence of the respondents about new technologies and to gain more income by taking risk all these factors might have inferred the respondents to be in medium risk orientation.

The results are in conformity with the findings of Maraddi (2006) and Sidram (2008).

5.3.8 Achievement motivation

It was observed from the data in Table 5 that, 51.67 per cent of demonstration farmers were belonged to medium achievement motivation category, whereas, 55.00 per cent of non-demonstration farmers were belonged to low achievement motivation category. Achievement motivation is more of a psychological variable which differs from individual to individual. It is assumed that achievement motivation forces the individual towards reaching some goals, which he has set for himself. Higher the association with the individual, higher will be his efforts. This can be attributed to the social status of a respondent, who feels to keep greater goals. The findings are in accordance with the studies conducted by Raghavendra (2010).

5.3.9 Scientific orientation

The analysis of the results presented in Table 5 revealed that, 43.33 per cent of demonstration farmers belonged to medium scientific orientation category, whereas, 50.00 per cent of non-demonstration farmers were belonged to low scientific orientation category. It is the logical thinking, foresight and rationality which help the individual to understand the object. It might be due to this reason that those who had higher scientific orientation had higher knowledge about cultivation practices of transplanting method of redgram cultivation. The results were in consonance with the findings reported by Palaniswamy and Sriram (2001) and Raghavendra (2010).

5.3.10 Mass media utilization

The data presented in Table 5 revealed that, 41.67 per cent of demonstration farmers belonged to medium mass media utilization category, whereas, 46.67 per cent of non-demonstration farmers were belonged to low mass media utilization category. The reason might be the mass media provides information on experiences of successful farmers through various channels like television, radio, newspaper, farm magazine *etc.*, which reinforces confidence in other farmers to take up similar activities or try out new innovations. The results were in conformity with the findings of Ramanna *et al.,* (2000), Dhamodaran and Vasantha Kumar (2001).

5.3.11 Extension participation

It was observed from Table 6 that, majority 73.33 per cent, 61.67 per cent, 56.67 per cent and 50.00 per cent per cent of demonstration farmers regularly participated in demonstrations, training, field day and krishimela respectively. Around fifty per cent of demonstration farmers participated in extension meeting and group discussion, field visit and educational tour occasionally.

In case of non-demonstration farmers observed that, majority of non-demonstration farmers never participated in educational tour (75.00%), demonstrations (70.00%), training (68.73%), field day (60.00%), field visit (58.33%) and extension meeting (50.00%). Whereas around fifty per cent of them occasionally participated in group discussion and krishimela.

The probable reason for above finding might be due to their interest in extension activities, which directly helps them to get the information on relevant innovations, technologies and skills which help them to seek information from extension experts, subject matter specialists, scientist *etc.* from the Krishi Vigyan Kendra (KVK). This intern helps to increase their knowledge and adoption level. The results are in line with the Kanvi (2000) and Raghavendra (2004)

5.3.12 Sources of information

The perusal of the Table 7 revealed that, majority (83.33%) of demonstration and 43.33 per cent of non-demonstration farmers consulted Agricultural University SMS followed by Progressive Farmers (70.00% and 66.67%), Agricultural Assistant (65.00% and 48.33%), Assistant Agricultural Officers (63.33% and 45.00%), Private Agency Extension Officer (58.33% and 41.67%), , Neighbours (53.33% and 50.00%), respectively.

The possible reason for this might be due to the fact that majority of the farmers got information from agricultural university SMS may be due to most of the farmers participated in extension activities. Farmers are influenced by seeing the progress made in famers field and they feel progressive farmers are correct source of information. The possible other reason may be progressive farmers and neighbors helps the fellow farmers to increase their yield and other services in the production process. Majority of the farmers have got information from AAOs and AAs may be due to their easy availability in local areas as they are government officials located in Hobli level which is close to their village and respondents come in their contact for various purposes like agriculture information, inputs etc. Agricultural input dealers were providing

effective extension guidance for the farmers in their jurisdiction in order to keep updated for their clients. The findings of the result were similar to the findings of Raghavendra (1997).

5.4 Relationship between selected independent variables of the respondents with their knowledge level and adoption level

5.4.1 Relationship between selected independent variables of the respondents with their knowledge level

5.4.1.1 Age and knowledge

The association between knowledge and age was found to be non-significantly related with the knowledge level of both demonstration and non-demonstration farmers. This inferred that farmers of different age group had similar knowledge level regarding transplanting method redgram cultivation practices. The knowledge level of younger and middle farmers was higher than old farmers, but this was not significant. The above findings were in conformity with the Kanavi (2000).

5.4.1.2 Education and knowledge

The association between education and knowledge level of demonstration and non-demonstration farmers was found to be significant and positive. It is a known fact that, formal education widens the horizons of an individual. In addition, the possible reasons for significant association might be that literate people were more receptive and always in search for new information and technologies which help them to improve their socio-economic conditions. Further, demonstration farmers were slightly more educated than non-demonstration farmers. Therefore, demonstration farmers understand the information learnt from the different sources will be enhanced through education. Similar results were obtained by Kharatmol (2006) and Thippeswamy (2007).

5.4.1.3 Farming experience and knowledge

Farming experience was found to be significantly related with knowledge level of demonstration and non-demonstration respondents. Farmers having greater farming experience understand better about practices. This finding is in close agreement with the findings of Maraddi (2006) in respect of recommended practices.

5.4.1.4 Land holding and knowledge

Land holding was found to be significantly related with knowledge level of demonstration and non-demonstration farmers. This inferred that, farmers with different land holding had different knowledge level regarding recommended practices. With respect to land holding, big farmers tend to have more knowledge compared to small farmers. Because, big farmers having more land holding and they invest more on agriculture but outcome they got was very less as compared to small farmers. Because, improper management of farm, climatic change and labour problems. Now this transplanting method of redgram cultivation practices is gaining importance in that local area. Therefore big farmers showing an interest towards this new practice as compare to small farmers with respect to demonstration and non-demonstration farmers. This finding is in conformity with the results reported by Kharatmol (2006).

5.4.1.5 Annual income and knowledge

A non-significant relationship was noticed between the annual income and the knowledge level of the respondents. The knowledge obtained by the respondents might have nothing to do with their annual income. The knowledge level of the respondents might be due to their past experience and through use of different mass media or interaction between the respondents. This might have led to then non-significant relationship between annual income and knowledge level of the respondents. This finding is in conformity with the results reported by Kharatmol (2006).

5.4.1.6 Innovativeness and knowledge

Innovativeness and knowledge were found to be positive and significantly associated knowledge level of demonstration respondents only. Innovation decision process necessarily requires knowledge as the first step for adoption of farm technology. This implies that higher the level of knowledge more will be the persuasion of the respondent to adopt or reject innovation. Hence the findings were observed. Similar, findings were reported by Kharatmol (2006) and Raghavendra (2010).

5.4.1.7 Risk orientation and knowledge

Risk orientation was significantly related to the knowledge level of the demonstration and non-demonstration farmers. This implies that farmers, who had favourable risk orientation towards management and scientific knowledge would like to know new ideas wants to take risks in farming and would try to gather more information which could be implied at the field level for

increasing production naturally they will prone to acquire more knowledge. The results of the study were in line with the studies reported by Maraddi (2006) and Hinge (2009).

5.4.1.8 Achievement motivation and knowledge

Achievement motivation was positive and significantly related with the knowledge level of the respondent. Achievement motivation forces the individuals to reach a goal. Respondents have a motive to do something. Because of low yield, lack of irrigation water and low price to the product. Middle and young age group of the farmers were more active to know and understand these new concepts of transplanting method redgram cultivation practices. Therefore, the middle and young age group of farmers have strong motivation to achieve and attain a higher status and their aspiration level is comparatively higher, which creates and urge to excel in life. This finding is in conformity with the results reported by Binkadakatti (2008).

5.4.1.9 Scientific orientation and knowledge

Scientific orientation was found to be positively and significantly related with the knowledge level of demonstration farmers and non-demonstration farmers. This might be due to the fact that respondents with higher scientific orientation would try to gather more information which could be applied at the field level and also technical information helps in increasing production. The findings were in consonance with the findings of Anasuya (1997) and Resmy (1998).

5.4.1.10 Mass media utilization and knowledge

Mass media participation was significantly related with knowledge level of the respondents. In the present study it was found that, majority of the demonstration and non-demonstration farmers (i.e. more than sixty per cent) were belonged to medium and high level of mass media participation category, respectively. Exposure to different mass media sources like newspaper, radio and television might have helped the respondents to gain recent information. The advent of mass media provided enormous opportunities for farmers to expose to new technology and motivated them to take further interest to learn about them. Hence, those farmers who had higher exposure to mass media had exhibited higher knowledge. Similar, findings were reported by Kanavi (2000) and Kharatmol (2006).

5.4.1.11 Extension participation and knowledge

The extension participation exhibited positive and significant relationship with knowledge of the demonstration and non-demonstration farmers. The positive and significant relation between extension participation and knowledge level of farmers irrespective of whether they were demonstration or non-demonstration was quite evident due to the fact that, more contacts by the farmers with the extension workers, which provided them an opportunity to know and discuss regarding modern practices, which intern enriched their knowledge. But, demonstration farmers had slightly more knowledge than non-demonstration farmers. Because of greater contacts with extension personnel might have motivated the farmers in various ways, therefore they might have gained more knowledge than the non-demonstration farmers, due to the wider exposure, contact and interaction with source of technical information i.e. extension personnel, subject matter specialist of KVK and scientist. Another possible reason could be due to availability of different activities in the study areas the government official's, private agencies and also together extension agencies might have concentrated more extension activities in the study areas. Hence, due to the direct or indirect participation of farmers, their knowledge level might have increased to a greater extent. The above findings were in conformity with the Kharatmol (2006).

5.4.1.12 Sources of information and knowledge

Sources of information and knowledge were found to be positive and significantly associated with knowledge level of demonstration and non-demonstration farmers. The sources of information consultancy provides opportunities to get more information on new practices and serves as reinforcement in gaining knowledge about new technology practices prevailing in other region or locality. Increased source of information consultancy enhances the ability of farmers to get more information, which might have helped the farmers to understand and analyse the new technology practices. Similar, results were reported Sharanappa (2011) and Manjunatha (2011).

5.4.2 Relationship between selected independent variables of the respondents with their adoption level

5.4.2.1 Age with adoption

Age showed non-significant relationship with adoption of transplanting method of redgram cultivation practice of both the categories of demonstration and non-demonstration farmers. The negative trend indicated that, as age increases the level of adoption of transplanting

method of redgram cultivation practice was decreased but not to the significant extent. This was in conformity with the research findings reported by Kharatmol (2006).

5.4.2.2 Education and adoption

Formal education level of demonstration and non-demonstration farmers was found significantly related with adoption of transplanting method of redgram cultivation practice.

The possible reason could be that higher education of the farmers might have helped them to a larger extent in grasping and retaining the complex agriculture technology. The higher education of the farmers might have made them to get exposed to printed media and department contact *i.e.* subject matter specialist, scientist and private agency. Many of the transplanting method of redgram cultivation practices require certain amount of scientific knowledge and skills to adopt, which can be easily accepted by farmers who had better formal education than those who lack of it. Therefore, farmers who had better education, acquired information, resulting in the adoption of transplanting method of redgram cultivation practice. Hence, the significant relationship was observed with education and adoption, besides the demonstration and non-demonstration respondents. The above findings were in agreement with the research findings of Rathod (2005) and Rai and Singh (2010).

5.4.2.3 Farming experience and adoption

Farming experience had non-significant relationship with adoption of demonstration and non-demonstration farmers about transplanting method of redgram cultivation practice. The probable reason might be that, the transplanting method of redgram cultivation practice is now gaining importance in the present context. Therefore demonstration and non-demonstration farmers need these practices for their farm management irrespective of farming experience i.e. higher experience or lower experience all type of respondents need these practices. Therefore, farming experience might have not affected its adoption by low or high experience. This finding is in conformity with the results reported by Binkadakatti (2008).

5.4.2.4 Land holding and adoption

A significant relationship between land holding and adoption level of respondents was noticed that farm size contributes significantly in enhancing the adoption level of the demonstration and non-demonstration farmers.

The probable reason for this kind of result may be that farmers with larger holdings will have more opportunities and potentialities to try and adopt large number of technological innovations. As a result, it is quite possible that farmers with larger holdings evince keen interest to know about new farm practices and be more receptive to such ideas, skills and other management factors, which intern on their extent of adoption of recommended practices. Therefore, land holding must have positive relationship with the extent of adoption. Krishnamurthy (1999) and Thippeswamy (2007) observed positive and significant relationship between size of land holdings and the adoption.

5.4.2.5 Annual income and adoption

A significant relationship was observed between the annual income and adoption of the demonstration and non-demonstration farmers. Income of farmers has influenced the adoption of recommended practices; the farmers with low annual income were low adopters while those with high annual income were high adopters. Generally, the farmers have to invest more when they have to adopt new technology or to follow scientific farm operations. It is also true when it is question of using inputs like fertilizers and chemicals at recommended levels. These inputs cost more than the traditional inputs used by the farmers. Hence, farmers with higher income status can afford investing on such items and adopt most of the recommended practices, while farmers with low income resources cannot afford. This might be possible reason for better adoption of recommended practices by transplanting method of redgram growers of high economic status. Similar findings have been reported in the past Raghavendra (1997) and Reshmy (1998).

5.4.2.6 Innovativeness and adoption

Innovativeness proneness and adoption were found to be positively and significantly associated. Innovation decision process necessarily requires knowledge as first step for adoption of farm technology. Transplanting method of redgram cultivation being a new technology practices there is a tendency in farmers to adopt new farm practice, so as to get higher yield and profit, hence the findings were observed. The findings of the study were in conformity with the findings reported by Meti (1998) and Kharatmol (2006).

5.4.2.7 Risk orientation and adoption

Risk orientation was significantly related to the adoption level of the demonstration and non-demonstration farmers. This implies that farmers who had favourable orientation towards management and scientific knowledge would tend to be more willing to adopt the latest

technology on their field and risk relates to the extent of pains taken by a farmer to achieve greater success than others. Hence risk orientation of farmers has significant effect on their adoption level of recommended practices. The findings were in line with Meti (1998) and Rathod (2005).

5.4.2.8 Achievement motivation and adoption

Achievement motivation was positive and significantly related to the demonstration farmers, but it is not significant with the non-demonstration farmers with respect to the adoption level. Demonstration farmers have motive to achieve something, because they were influenced by the training courses but non-demonstration farmers do not have much motive as compared to demonstration farmers. Training provides them to know about new practices, technologies and skills. Therefore, the middle and young age group of farmers have strong motive compare to older one to achieve and attain a higher status and their aspiration are comparatively higher which creates an urge to excel in life. So achievement motivation and adoption level was significantly related with demonstration farmers but not to non-demonstration farmers. This finding is in conformity with the results reported by Binkadakatti (2008).

5.4.2.9 Scientific orientation and adoption

The significant relationship was observed between scientific orientation and adoption of demonstration and non-significant relationship was observed for non-demonstration farmers. The possible reason for significant relationship may be due to the fact that respondents with more scientific outlook would be more willing to try latest technologies and hence adopt them in their fields. The possible reason for non-significant relationship may due to the fact that non-demonstration farmers who are traditional and with less scientific outlook, they will never try the latest technologies, they always practice the same old technologies hence there is no relationship between scientific orientation and adoption of non-share-holders. The findings of the study were in line with the Kharatmol (2006).

5.4.2.10 Mass media participation and adoption

Mass media significantly related with adoption level of the demonstration famers and non-demonstration farmers. This might be because of exposure to different mass media sources like newspapers, radio and television might have helped the respondents to gain recent information. The advent of mass media provided enormous opportunities for repeated exposure of farmer to new technology which motivating them to take further interest to learn about them.

Hence, farmers who had higher exposure to mass media had exhibited higher adoption irrespective of demonstration and non-demonstration farmers. Similar, results were reported by Kanavi (2000), Kharatmol (2006) and Binkadakatti (2008).

5.4.2.11 Extension participation and adoption

The relationship between extension participation and adoption of transplanting method of redgram cultivation practices among demonstration and non-demonstration farmers was significant. The possible reason for this trend may be that, the farmers who had participated in demonstration, training course, attended meeting, field days, tours, Krishimela might have come in closer contact with extension personnel and other farmers leading to increased knowledge about cultivation practices, which might have motivated them for positive action that is adoption. The other reason could be that extension the participation provides opportunity for farmers to exchange their ideas based on their experience thus leading to higher adoption. The findings of the present study were in conformity with the findings reported by Kharatmol (2006).

5.4.2.12 Sources of information and adoption

Sources of information were positive and significantly related to the demonstration farmers and non-demonstration farmers with respect to the adoption level. The advent of sources of information consultancy provided enormous opportunities to get huge information on new technology which helps them to take further interest to learn about them. Hence, farmers who had higher consultancy to sources of information had exhibited higher level of adoption. Similar, results were reported Sharanappa (2011) and Manjunatha (2011).

5.5 Constraints faced by the respondents in adoption of transplanting method of redgram cultivation

The constraints as expressed by the demonstration farmers were majority of expressed that low price to the product (78.33%), whereas, 75.00, 66.67, 60.00 and 50.00 per cent of demonstration expressed that non availability of labour, high cost of cultivation practices, pest management problem and nursery management problem, respectively. While, less than fifty per cent of farmers had constraints of lack of irrigation water (41.67%), high wages of labours (33.33%) and disease management problem (23.33%), respectively.

In case of non-demonstration farmers they had expressed constraints like 81.67 per cent of respondents had problems of high cost of cultivation practices, whereas, 73.33, 63.33 and 60.00 per cent had expressed that lack of irrigation water, non availability of labour and lack of awareness respectively. And 53.33, 51.67, 50.00 and 38.33 per cent of respondents had expressed that low price to the product, lack of knowledge, pest management problem and disease management problem respectively.

The probable reasons for the above constraint could be that, majority of the farmers expressed the low price to the product the reason might be the large number of farmers grown redgram at a time due to more production of redgram in market leads to lesser price, there is no scientific rate, supporting price is too low and lack of storage facility leads to glut in the market. High cost of cultivation practices the reason might be the now all inputs are high cost and more cost required for nursery preparation, transplanting and plant protection measures.

Non-availability of labour the reason could be due to migration of labours to nearby industrial cities and most of the young generation gets engaged in non-agricultural operations. High wages of labours is related directly to the non-availability of labours as the shortage of any goods escalates its cost.

The reason attributed for lack of knowledge could be the less contact with the department, subject matter specialist, scientist, private agency and less expose to mass media.

Lack of irrigation water the reason might be the low rainfall and scarcity of irrigation sources in that area. Nursery management problem reason could be the lack of skilled labours for preparation of seedling and lack of management skill. Majority of the respondents expressed pod borer and wilt disease were a serious problem once those occurs it is difficult to control resulting in heavy loss of yield.

5.6 Cost and returns of transplanting method of redgram cultivation practices

The result indicates that B: C ratio of demonstration farmers was found that 1:3.02 and non-demonstration farmers were 1:2.05, respectively. With respect to yield per acre, 41.66 per cent of demonstration farmers were obtained the yield of the crop as more than 10 quintals per acre. While in case of non-demonstration farmers 35.00 per cent of them were obtained the yield more than 5 quintals per acre. This might be the fact that demonstration farmers had knowledge

and adoption level is almost corresponding to each ranging from medium to high level whereas non-demonstration farmers had low level of knowledge and adoption of correspondence.

Regarding cost per acre transplanting method of redgram production, which was Rs. 11000-11500 in case of 40.00 per cent of demonstration farmers, while, regarding non-demonstration farmers 43.33 per cent of farmers cost was in the range of Rs. 6500-7000. This might be the fact that cost of cultivation depends on number of labours used and their wages, price of the seeds, the quantity of fertilizers and chemicals applied and the management of other factors of production.

With regard to profit per acre 46.67 per cent of demonstration farmers obtained the profit in the range of Rs. 20000-23000. In case of non-demonstration farmers 38.33 per cent of them were obtained the profit in the range of Rs. 6000-8000. The possible reason might be the profit depends on the day to day fluctuation of the price, the time of selling the produce and yield obtained.

The findings were in conformity with the earlier research results obtained by Razack (2000) and Radha and Choudhary (2005).

Summary and Conclusions

VI. SUMMARY AND CONCLUSIONS

Redgram (Pigeon pea) is sometimes grown as a sole crop, but more typically, it is grown in relatively complex systems where it is intercropped, or mixed with other crops. Redgram is generally broadcasted, but line sowing is superior over broadcasting. Broadcasting results in uneven plant population which ultimately results in low yield. In general transplanting of redgram seedlings is one of the alternate agronomic practices to overcome late sowing and related lower yields of redgram. This technique involves rising of seedlings in polythene bags in the nursery for one month and transplanting the seedlings with the onset of monsoon after the soil profile is uniformly wet.

This method uses lesser seed, chemical inputs and promotes soil biotic activities in and around plant root zone, enhanced through liberal applications of compost and harrowing that aerates the soil. Further Transplanting at wider spacing allows enough sunlight to reach the leaves of each redgram plant thus reducing competition for water, space and nutrients resulting in the spread of roots and healthy growth of plants. These changed practices with lower inputs counter-intuitively lead to improved productivity and yield. Now it is cultivated mainly in Bidar and Gulbarga districts and in the days to come it may occupy larger redgram cultivated area in the state especially in northern parts of Karnataka. During 20010-11, about 4000 hectares of area was under transplanted redgram (KVK, Bidar). Hence the present study is proposed to know the different dimensions of redgram cultivation in the changed scenario with the following specific objectives.

1. To study the personal, socio-economic and psychological characteristics of respondents
2. To study the knowledge and adoption level of respondents regarding transplanting method of redgram cultivation practices
3. To find out the relationship between selected independent variables of the respondent with their knowledge and adoption level
4. To elicit the constraints in adoption of transplanting method of redgram cultivation

Methodology

Bidar district was purposively selected for the study. The Bidar district is considered as pulse bowl of Karnataka where in pulses like Blackgram, Greengram, Redgram and Bengal gram

grown in 195407 ha area. Among these pulses, the share of redgram is 67,000 ha area. Bidar district had highest area under transplanting method of redgram cultivation (4360 ha). Bidar district comprises five taluks namely, Aurad, Basav Kalyn, Bhalki, Bidar, and Humnabad. Out of five taluks, three taluks namely Aurad, Bidar and Humnabad were purposively selected, because they had highest area of transplanting method of red gram cultivation and highest demonstration on transplanting method of redgram cultivation were conducted by KVK, Bidar. From each taluks, four villages and from each village, ten farmers were selected by following higher number of demonstration on transplanting method of redgram cultivation farmer available in the village and highest area under transplanting redgram cultivation . The villages selected were Hudagi, Nimbur, Chitaguppa and Talamadagi from Humnabad taluka. Astur, Magadal, Janawad and Rajgera from Bidar taluka. Jojana, Gadikushanoor, Shambelli and Naganapalli from Aurad taluka. Thus totally twelve villages were selected for the study. List of farmers from each of the twelve selected villages was obtained. From each village, ten farmers were selected randomly by following random sampling procedure. Again from each village, five farmers from the list who have undergone demonstration on transplanting redgram conducted by KVK, Bidar and five non-demonstration farmers of transplanting method of redgram cultivation practices from the each village were randomly identified for making total sample size was one hundred and twenty (i.e. 60 demonstration and 60 non-demonstration farmers). Thus 120 farmers formed the total sample for study**.**

Based on the objectives of the study an interview schedule was prepared. The information was elucidated from respondents with the help of structured schedule. The interview schedule was pre-tested in non sample area for its practicability and relevancy. Based on the experience gained, the interview schedule was modified wherever necessary. The final schedule was used to collect the information from the respondents by personally interviewing the farmers and the data was analyzed by using suitable statistical measures.

The main findings of the study are as follows

1. Fifty per cent of demonstration farmers were belonged to medium overall knowledge category. Whereas 48.33 per cent of non-demonstration farmers were belonged to low overall knowledge category.
2. Cent per cent of demonstration farmers and 75.00 per cent of non-demonstration farmers were known about variety BSMR-736.

3. In case of seed rate cent per of demonstration farmers and 66.67 per cent of non-demonstration farmers had knowledge.
4. With respect to seed treatment 76.67 per cent of demonstration and 46.67 per cent of non-demonstration farmers had knowledge.
5. Majority (81.67%) of demonstration farmers and fifty per cent of non-demonstration farmers had knowledge about the thinning practices.
6. With respect to recommended spacing majority (83.33%) of demonstration and 45.00 per cent of non-demonstration farmers had knowledge.
7. Majority (66.67%) of demonstration and 46.67 per cent of non-demonstration farmers had knowledge about the recommended dose of fertilizer.
8. Regarding nipping practices majority of (90.00%) of demonstration and 63.33 per cent of non-demonstration farmers had knowledge.
9. Majority (85.00% and 70.00%) of demonstration and (61.67% and 50.00%) of non-demonstration farmers had knowledge about pod borer pest and their control measures, respectively. With regard to disease and their control measures (80.00% and 63.33%) of demonstration farmers and (61.67% and 46.67%) of non-demonstration farmers had knowledge.
10. Nearly fifty, 48.33 per cent of demonstration farmers were belonged to medium adoption level category. Whereas 51.67 per cent of non-demonstration farmers were belonged to low adoption level category.
11. Cent per cent of demonstration farmers and 75.00 per cent of non-demonstration farmers fully adopted variety BSMR-736.
12. In case of recommended seed rate 83.33 per cent of demonstration farmers and 60.00 per cent of non-demonstration had fully adopted.
13. With respect to seed treatment 61.67 per cent of demonstration farmers had fully adopted, whereas 53.33 per cent of non-demonstration farmers had not adopted.
14. With regard to thinning practices 66.67 per cent of demonstration farmers and fifty per cent of non-demonstration farmers had fully adopted.
15. With respect to spacing 68.33 per cent of demonstration and 45.00 per cent of non-demonstration farmers had fully adopted as per recommendation.

16. In case of recommended dose of fertilizer 53.33 per cent of demonstration farmers had fully adopted, while 56.67 per cent of non-demonstration farmers had not adopter category.

17. Regarding nipping practices 81.67 per cent of demonstration and only 51.67 per cent of non-demonstration farmers had fully adopted.

18. With regard to pest management 50.00 per cent of demonstration farmers had fully adopted, while 50.00 per cent of non-demonstration farmers had not adopted Indoxacarb for control of pod borer. In case of disease management 48.33 per cent of demonstration farmers had fully adopted, while 35.00 per cent of non-demonstration farmers had not adopted Carbendizim for control of wilt disease.

19. It revealed from the data that, 35.00 per cent of demonstration farmers and 25.00 per cent of non-demonstration farmers were educated up to high school, respectively.

20. Nearly, fifty (46.67%) per cent of demonstration farmers and 30.00 per cent of non-demonstration farmers were belonged to medium land holding farmers category.

21. Majority (65.00%) per cent of demonstration farmers and 36.67 per cent of non-demonstration farmers were belonged to high income category.

22. Fifty five per cent of demonstration farmers were belonged to medium innovativeness category. Whereas 45.00 per cent of non-demonstration farmers were belonged to low innovativeness category.

23. More than fifty (56.67%) per cent of demonstration farmers were belonged to medium risk orientation category, while 58.33 per cent of non-demonstration farmers were belonged to low risk orientation category.

24. Around fifty (51.67%) per cent of demonstration farmers were belonged to medium achievement motivation category, while, 55.00 per cent of non-demonstration farmers were belonged to low achievement motivation category.

25. Nearly, fifty (43.33%) per cent of demonstration farmers were belonged to medium scientific orientation category, while 50.00 per cent of non-demonstration farmers were belonged to low scientific orientation category.

26. With respect to mass media utilization 41.67 per cent of demonstration farmers belonged to medium category, whereas, 46.67 per cent of non-demonstration farmers were belonged to low category.

27. In case of extension contact cent per cent of demonstration farmers participated in demonstrations. Majority of them participated in Extension group meetings (96.67%), Krishimela (88.33%), Field day (88.33%), Trainings (85.00%), Group discussion (85.00%), field visit (81.67%) and Educational tour (70.00%). In case of non-demonstration farmers participated in Krishimela (78.33%) and Group discussion (63.33%). Majority of non-demonstration farmers were not participated in Educational tour (75.00%), demonstration (70.00), Training (68.33%), Field day (60.00%), Field visits (58.33%) and Extension Group Meetings (50.00%).

28. Regarding sources of information, majority (83.33%) of demonstration and 43.33 per cent of non-demonstration farmers consulted Agricultural University SMS followed by Progressive Farmers (70.00% and 66.67%), Agricultural Assistant (65.00% and 48.33%), Assistant Agricultural Officers (63.33% and 45.00%), Private Agency Extension Officer (58.33% and 41.67%), , Neighbours (53.33% and 50.00%), respectively.

29. The education, farming experience, land holding, extension participation, mass media utilization, risk orientation, achievement motivation and scientific orientation of demonstration farmers exhibited positive and significant relationship with their knowledge at 0.05 level of probability, whereas sources of information and innovativeness showed positive and significant relationship with their knowledge at 0.01 level of probability.

30. The education, farming experience, land holding, extension participation, mass media utilization, innovativeness, risk orientation, achievement motivation and scientific orientation of non-demonstration farmers exhibited positive and significant relationship with their knowledge at 0.05 level of probability, whereas, sources of information showed positive and significant relationship with their knowledge at 0.01 level of probability.

31. The education, land holding, annual income, extension participation, mass media utilization, risk orientation and achievement motivation of demonstration farmers exhibited positive and significant relationship with their adoption level at 0.05 level of probability, whereas sources of information, innovativeness and scientific orientation

showed positive and significant relationship with their adoption level at 0.01 level of probability.

32. The education, land holding, annual income, extension participation, mass media utilization, risk orientation, achievement motivation and scientific orientation of non-demonstration farmers exhibited positive and significant relationship with their adoption level at 0.05 level of probability, whereas sources of information showed positive and significant relationship with their adoption level at 0.01 level of probability.
33. Majority of demonstration farmers were expressed the constraints that, low prices to the product (78.33%) and non availability of labour (75.00%).
34. Majority of non-demonstration farmers were expressed the constraints that, high cost of cultivation practices (81.67%) and lack of irrigation water (73.33%).
35. Demonstration farmers had the benefit cost ratio of 1:3.02 on the contrary the non-demonstration farmers had Benefit Cost ratio of 1:2.05.

Implications of the study

The following are the implications for the findings of the study:

It was found that, gain in knowledge and adoption by both demonstration and non-demonstration farmers have clearly shown the difference between participant demonstration farmers and non-demonstration farmers on the improved selected technologies. Therefore the administrators, planners and executives must give the focal importance to execute the demonstrations concept and special orientation should be given to the departmental staff to train the progressive farmers and grassroot extension workers around these demonstrations.

The psychological factor, attitude towards demonstrations by participant and non-participant farmers have favored the opinion towards concept of demonstrations. Therefore the implementing officers should make an effort to utilize the demonstrations as an educational tool for full adoption of transplanting method of redgram cultivation practices to increase the production and productivity.

The study revealed that the personal and socio-economic characteristics of demonstration farmers have also influenced the knowledge and adoption of transplanting method of redgram cultivation. Therefore the administrators and implementing officers should also keep this is view

while selecting demonstrators. So that these demonstrators in turn motivate non-participant farmers for full adoption of transplanting method of redgram cultivation to increase the income of the family.

Suggestions for future research

1. The present study was conducted with a limited sample size. In order to derive wider generalization, a study with large sample size could be conducted.
2. Comparative studies on demonstration conducted by KVK's and Agriculture department on transplanting method of redgram cultivation practices can be taken up to derive wider generalizations.
3. Impact assessment of various demonstrations on different crops conducted by the Krishi Vigyan Kendra can be studied.

References

REFERENCES

Ahmed Zamir, S. K. and Phillip, H., 1999, Effectiveness of training of farm women in Andaman and Nicobar Islands. *Madras Agric. J.*, **86** (1-3): 154-157.

Anasuya, A., 1997, Impact of farmers field school on farming community, *M.Sc. (Agri) Thesis*, Tamilnadu Agricultural University, Madurai.

Angadi, S. C., 1991, A study on knowledge, adoption and marketing pattern of pomegranate growers in Bagalkot district in Karnataka state. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Ankulwar, B. N., Jondhale, S. G. and Rangari, P. V., 2001, Extent of adoption of recommended package of practices of sunflower by the farmers. *Maharashtra J. Ext. Edu.*, **20** : 63-65.

Annonymous, 1992, Ministry of rural development circular No. 280/12/16/91-IRD, III (vol.11), dated 15th November 1991. *Grameen Vikas Newsletter*, **8**(1): 14-20.

Babanna, T., 2001, Information source consultancy and training needs of farmers in Arecanut cultivation under Tungabhadra command area in Shimoga district. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Bangalore (India).

Behera, C. and Sahoo, M, S., 1975, Impact of National Demonstration on Adoption of Agricultural Practices, *Indian J. Extn. Edn.*, **11** : 32-35.

Bhagyalaxmi, K., Gopalakrishna Rao, V. and Sudarshan Reddy, M., 2003, Profile of the rural women micro-entrepreneurs. *Journal of Research*, Acharya N. G. Ranga Agricultural University, Hyderabad, **31**(4): 51-54.

Bhatol, N. P., 1989, A study on the of recommended *kharif* paddy cultivation technology in Anand taluka of Gujarat state. *M. Sc. (Agri.) Thesis,* Univ. Agric. Sci., Gujarat.

Bhople, R. S., 2000, Evaluation of KVK under NGO's in Vidharbha region *Ph. D. Thesis,* Dr. Punjab Rao Deshmukh Krishi Vidyapeeth, Akola.

Bhople, R.S., Kude, N.R. and Dhandkar, C.R., 1997, A study on cultivation practices and production constraints in *rabi* sorghum. *Maharashtra J. Extn. Edn.,* 16:62-64.

Binkadakatti, J. S., 2008, Impact of Krishi Vigyan Kendra (KVK) trainings on use of bio-fertilizers and bio-pesticides by Tur farmers in Gulbarga district. *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Birajdar, S. R., 1999, A study on knowledge and adoption behaviour of grape growing member farmers of Maharashtra Rajya Drasha Bagiatdar Sangh, Solapur. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad, Karnataka.

Budihal, R.A., Rajanna, K.M. and Mathad, J.C., 1994, Impact of plant propogation training on farmers. *Agric. Extn. Rev.,* **6** (1): 22-23.

Chandargi, D.M., 1996, A study on leadership styles of extension workers. *Ph.D Thesis,* Uni. Agric. Sci. Dharwad (India).

Chandramouli Pandeli, 2005,A study on entrepreneurial behavior of farmers in Raichur district of Karnataka *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad, Karnataka (India).

Chandregowda, K. N., 1997, A study on extent of adoption of improved cultivation practices of Chrysanthemum. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Bangalore.

Chandregowda, M. J. and Jayaramaiah, M., 1996, Integrated nutrient management in rice farming under four rice ecosystems. *Organic Farming and Sustainable Agriculture Abstracts, National Seminar*, October 9-11 organized by Univ. of Agric. Sci., Bangalore.

Channabasiah, 1981, Influence of Redgram Demonstrations on Farmers of Bangalore District, M Sc (Agri.) thesis (unpub), Dept, of Agric. Exten, Univ. of Agric. Sci., Bangalore.

Channal, G. P., 1995, A study on knowledge and adoption behaviour of shareholders and non-shareholders of co-operative sugar factories in Belgaum district of Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Deepak, M.P., 2003, A study on perception of beneficiaries and non-beneficiaries towards WTEP programme in Dharwad district. *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Dhamodharan, T. and Vasanthkumar, J., 2001, Relationship between selected characteristics of registered sugarcane growers an extent of adoption of improved sugarcane cultivation practices. *J. Extn Edu.,* **12**(2): 3138-3143.

Gogoi, M.E., Phukan and Talukdar, R. K., 2000, Impact of farmers training programme on adoption of rice production technology by farmers. *Maharashtra J. Extn Edu.*, 19 - 232 -238.

Hanumanaikar, R. H., 1995, A study on knowledge, adoption and marketing behaviour of Sunflower growers in Dharwad district. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Hinge, R. B., 2009, A study on diffusion and adoption of wine grape production technology in Maharashtra. *M. Sc. (Agri.) Thesis*, (Unpub.), Univ. Agric. Sci., Dharwad, Karnataka.

Hiremath, N.S., 2000, Participation of rural youth in farm and non-farm activities. *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Hirevenkanagoudar, L.V., 1984, Impact of National Demonstration on Participation and Non-Participation Farmers, *Indian J. Extn. Ed.*, **20**(1): 76-78.

Ingle, Lalit Arun 1997, Impact of farmers training programme of Krishi Vigyan Kendra on Knowledge and adoption of improved practices of groundnut in Aurangabad Distract *M.Sc. (Agri.) Thesis*, Maharastra *Agric.Unvi.*, Parbhani.

Jagdale, V.D. and Nimbalkar, S.D., 1993, Constraints of Farmers in Adoption of Recommended Dry Farming Technology, *Maharashtra J. Extn. Edu.*, **12**: 173-176.

Jyothi, V., 2000, Information sources consultancy as on approach to crisis management by tomato growers. *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Bangalore.

Kalaskar, A. P., Shinde, P. S. and Bhople, R. S., 2001, Correlations of adoption of IPM technology by cotton growers. *Maharashtra J. Extn. Edu.*, 27: 45-48.

Kalasriya, B. N., Popat, M. N. and Patel, B. P., 1997, Knowledge level of Hybrid-6 Cotton growers. *Maharashtra J. Extn. Edu.*, 16: 386-388.

Kamarudeen, M, 1981, A study on the Impact of National Demonstration Programme on Paddy Cultivation in Trichur District, *M.Sc Thesis* College of Agriculture, Vellayani, Trivandram.

Kamble, S. P., 1998, Impact of Krishi Vigyan Kendra training on participant rural women.*M. Sc. (Agri*.) *Thesis,* Maharashtra Agric. Uni., Parbhani.

Kanavi, V. P., 2000, A study on the knowledge and adoption behaviour of Sugarcane growers in Belgaum district of Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Karpagam, C., 2000, A study on knowledge and adoption behaviour of Turmeric growers in Erode district of Tamil Nadu. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Karthikeyan, C., Chandrakandan, K. and Parvati, S., 1996, Factors influencing adoption behaviour of sugarcane growers. *J. Extn. Edu.*, **7**(1): 1331-1334.

Kavaskar, M. and Govind, S., 2006, Correlates of independent variables with knowledge level of banana growers. *Asian J. Extn. Edun*., **25(**1&2): 64-67.

Kerutagi, M. G., Kotikal, Y. K. and Sudhindra, M., 2000, Costs and returns of brinjal production in Gokak taluk of Belgaum district. *Karnataka J. Agric. Sci.*, **13**(1): 500-502.

Kharatmol, 2006, Impact of trainings conducted on vermicompost by Krishi Vigyan Kendra, Bijapur. *M. Sc. (Agri.) Thesis,* Univ. Agric. Sci., Dharwad (India).

Kibey, M.B., Patil, R.P. and Desai, B.R., 1984, Impact of National Demonstration on the Adoption of Improved Agricultural Technology by the Demonstrating Tribal Farm, *Maharashtra J. Extn. Edu.*, **3**: 61-65.

Korikantimath, V. S., Hiremath, G. M., Peter, K. V., Shripad, P. V. and Naik, A. D., 2000, Economics of mixed cropping of Byadagi chilli and cotton. *Karnataka J. Agric. Sci.*, **13**(1): 73-78.

Krishanamurthy, B., 1999, An analysis of impact of the farmers field on IPM in rice. *Ph.D Thesis,* Univ. Agric. Sci., Bangalore.

Krishnamurthy, B., Narayan, M.L., Lakshminarayan, M.T. and Manjunath, B.M., 1998, Characteristics of adopters and non-adopters of weedicides in paddy. *Ind. J. Ext. Edu*., **9 (2)** : 2039-40

Kumar, H. S., 1998, A study on knowledge, adoption and economic performance of banana growers. *M.Sc. (Agri.) Thesis, Univ. of Agric. Sci.,* Bangalore.

Manjunatha, 2011, A study on knowledge and adoption of bt cotton recommended production practices followed by the farmers in Raichur district of Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Raichur (India).

Maraddi, G. N., 2006, An analysis of sustainable cultivation practices followed by Sugarcane growers in Karnataka. *Ph. D. Thesis*, Univ. Agric. Sci., Dharwad (India).

Maraddi, G. N., Hirevenkanagoudar, L. V., Verma, N. S. and Halakeri, A. V., 2004, the constraints in the adoption of Cotton production technologies in Malaprabha command area of Karnataka. Paper presented In: *International Symposium on "Strategies for Sustainable Cotton production"- A Global Vision,* Univ. Agric. Sci., Dharwad, November 23-25, p. 98.

Meti, S. K. and Hanchinal, S. N., 1994, A study on the adoption pattern in the cultivation practices of sunflower crop. *Maharashtra J. Ext. Edu.*, **13** : 85-90.

Meti, S. K., 1998, technology reach, perception, knowledge, adoption and attitude towards improved agricultural technologies by small an marginal farmers in Tungabhadra command area. *Ph. D. Thesis*, Univ. Agric. Sci., Dharwad (India).

Moulik,T.K and Rao, C.B.S., 1973, *Self rating personality scale for farmers*, in a Pareek, V and Rao,v.T., Handbook of Psychological and social instruments samithi, Baroda.

Mutkule, S. R., Wattamwar, V. T., Narkar, G. S. and Geete, H. M., 2001, Constraints in adopting chilli technology. *Maharashtra J. Ext.Edu.,* **20**: 85-87.

Nagadev, B and Venkataramaih, P., 2007, Characteristics of integrated pest management (IPM) trained dry paddy farmers. *The Andhra Agric. J.,* **54**(3&4) : 240-242

Nagaraj, K. H. and Katteppa, 2002, Adoption of improved cultivation practices of groundnut by farmers. *J. Ext. Edu.,* **13**(1): 3277-3282.

Nagaraj, M. V., 2002, A study on knowledge of improved cultivation practices of sugarcane and their extent of adoption by farmers in Bhadra Command area in Davangere district, Karnatka. *Ph. D Thesis, Univ. of Agric. Sci.,* Dharwad (India).

Nagaraja, N., 1989, A study on management efficiency and economic performance of sericulture in Karnatraka. *Ph. D. Thesis,* Univ. Agric .Sci., Bangalore.

Nagesh, P.N., 2005, study on Entrepreneurial behaviour of Vegetable seed producing Farmers of Haveri district. M.sc. (Agri) Thesis. University of agriculture science, Dharwad.

Natikar, K. V., 2001, Attitude and use of farm journal by the subscriber farmer and their profile. A critical analysis. *Ph. D. Thesis,* Univ. Agric. Sci., Dharwad.

Nayak, R. B., 2007, A study on management practices of Pineapple growers in Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Nikam, T.R. and Singh, T.P., 1984, Impact of National Demonstration on the Knowledge and Adoption Behaviour of Tribal Farmers from Dhulia District of Maharashtra, *Maharashtra J. Extn. Edu.,* **3**: 73-76.

Ninga Reddy, 2005, A study on knowledge, extent of participation and benefits derived by participant farmers of the watershed development programme in Raichur district of Karnataka state. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Oliver, J., Raveendran, N. and Menon., K.R., 1975, National Demonstration – An Analysis as a Farm based Extension Medium, *The Madras Agric. J.,* **61** (1-12) : 615-618.

Palaniswamy, A. and Sriram, N., 2001, Modernization characteristics of sugarcane growers. *J. of Extn. Educ.,* **11**(4) : 2906-2915.

Pandurangadu, K. and Raju, V. T., 1990, Economics of pesticide use on cotton farms in Guntur district of Andhra Pradesh. *Agricultural Situation in India*, **45**(7): 467-470.

Pathak, S., Pal, M.K., Ghva. And Roy, M.K., 1979, Impact of National Demonstration on Knowledge, Attitude and Adoption level of Farmers in West Bengal, *Indian J. Extn. Edu.*, 15:49.

Patil, N., 2005, A study on knowledge, extent of participation and benefits derived by participant farmers of the watershed development programme. *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Patil, S. S., 2000, A study on adoption of banana production technology under drip irrigation. *M. Sc. (Agri.) Thesis,* Maharashtra Agric.Unvi., Parbhani (India).

Patil, S.B., 1995, A study on knowledge and adoption behaviour of commercial sunflower growers and seed producers in Ranebennur taluk of Dharwad district. *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Prabhu, S., 2006, A study on management orientation and economic performance of Chrysanthemum growers in Northern Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Radha, Y. and Chowdry, K. R., 2005, Comparative economics of seed production vis-à-vis commercial production of cotton in Andhra Pradesh. *Indian Journal of Agricultural Economics*, **60**(1): 94-102.

Radhakrishna Moorthy, D., 1969, Impact of National Demonstration of Farmers – A Study in two Districts of Andhra Pradesh, M.Sc thesis (unpub.), Extension Education Institute, Hyderabad.

Raghavendra K.M., 2010, An impact front line demonstration of sunflower on farmer's knowledge and adoption- A study in Bijapur district of Karnataka. *M.Sc. (Agri.) Thesis,* Univ. Agric. Sci. Dharwad.

Raghavendra, H. N., 1997, A study on knowledge and adoption behaviour of arecanut farmers of South Canara district, Karnataka state. *M. Sc. (Agri.) Thesis,* Univ. Agric. Sci., Bangalore, Karnataka (India).

Raghavendra, M. R., 2004, Knowledge and adoption of post harvest technologies by Redgram cultivators in Gulbarga district of Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Raghunandan H. C., 2004, A study on knowledge and adoption level of soil and water conservation practices by farmers in Northern Karnataka. *M. Sc. (Agri.) Thesis,* Univ. Agric. Sci., Dharwad (India).

Raghupathi, D., 1994, Agricultural modernization among farmers in Upper Krishna Project Area of Karnataka. *Ph.D. Thesis,* Univ. Agric. Sci., Bangalore, Karnataka (India).

Rai, D. P. and Bhupendra Singh, 2010, carried out a study on extent of knowledge and constrains in cotton production technology in Madhya Pradesh. *Indian Res. J. Extn. Edun.* **10**(2): 78-80

Rajaram, V., Ramamurthy, R. and Krishnadas, D., 2000, Integrated pest management in cotton. *Insect Environ*., 6 (1): 47-48.

Ramana, K. N. and Chandrakandan, K., 2001, Essential components of sustainable agriculture. *Kisan World*, **28**(1): 20.

Ranganath, A. D., 1997, A study on knowledge and adoption of organic farming practices among rice growers. *M.Sc (Agri) Thesis*, University of Agricultural Sciences, Bangalore.

Ranganatha, K.H., 1990, A Study on the Impact of Groundnut Demonstration conducted under National Oilseed Development Project, *M.Sc (Agri.) thesis (unpub.), Agril Ext, Univ. of Agric. Sci.,* Bangalore.

Rao, A.G., 1971, Impact of National Demonstration of Farmers of selected Villages in East Godavari District of Andhra Pradesh, *M.Sc (Agri.) Thesis*, Agricultural College and Research Institute, T.N.A.U., Coimbatore.

Rathod, D. N., 2005, A study on knowledge and adoption pattern of improved sugarcane practices in Bidar district, Karnataka state, *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci, Dharwad.

Ravi, G. K., 2007, A study on entrepreneurial behavioural characteristics of SC and ST farmers of Gulbarga district. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Razack, A., 2000, Economic evaluation of integrated pest management (IPM) programme. *M.Sc. (Agri.) Thesis*, Tamil Nadu Agril. Univ., Coimbatore.

Reddy, V. S. V., 2006, Knowledge and adoption of integrated pest management practices among vegetable growers of Gadag district in northern Karnataka. *M. Sc. (Agri.) Thesis*, Univ.Agric. Sci., Dharwad (India).

Reshmy, C., 1998, A study on sustainability of coconut and banana intercropping in Kerala-An analysis. Chandregowda, M. J. and Jayaramaiah, M., 1996, Integrated nutrient management in rice farming under four rice ecosystems. *Organic Farming and Sustainable Agriculture Abstracts, National Seminar*, October 9-11 organized by University of Agricultural Sciences, Bangalore. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Bangalore, Karnataka (India).

Sangram, R., 1997, A study on Knowledge and adoption of Integrated Pest Management practices by Redgram Growers of Gulbarga Dist, Karnataka. *M.Sc. (Agri.) Thesis, Univ. of Agric. Sci.*, Dharwad (India)

Saravanakumar, R., 1996, A study on management of Mango gardens by farmers in Krishinagiri taluka of Dharmapuri district, Tamil Nadu. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Satyanarayana, G. and Punna Rao, P., 2000, Knowledge of oil palm growers. *J.Ext. Edu.*, **11**(3): 2866-2870.

Sharanappa, 2011, A study on knowledge and adoption of recommended production practices of paddy by the farmers of Tungabhadra project area, Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Raichur (India).

Sharma and Sharma, B. M., 1999, Association between knowledge of farmers about important extension programme of KVK and selected independent variable. *Rur. Ind.*, pp. 279-281.

Sharma, M. L., Chauhan, M. S. and Sharma, P. N., 1997, Impact of Krishi Vigyan Kendra on Maize Growers. *Maharashtra J.Extn. Edu*., **16:** 335-336.

Shashidhara, D. N., 2004, A study on influencing factors and constraints in drip irrigation by horticulture farmers of Bijapur district.

Shashidhara, K. K., 2003, A study on socio-economic profile of drip irrigation farmers in Shimoga and Davanagere districts of Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Shinde, P. S., Vaidya, V. R. and Satpute, S. K., 2000, Identification and adoption of indigenous agricultural practices by dryland farmers. *Maharashtra J. Extn. Edun.,* **19** : 259-263.

Shivakumar, V., 1997, Farmers field school a medium of transmit know how and do how among rice growers – An analysis. *M.Sc (Agri) Thesis*, Tamil Nadu Agriculture University, Coimbatore.

Shivaraj. K., 1996, A study on knowledge and adoption level of IPM practices by Redgram growers of Gulbarga district. *M. Sc. (Agri.) Thesis*, Univ. Agric.Sci., Bangalore (India).

Siddaraju, G. C., 1992, Impact analysis of Grape Development Scheme on beneficiaries and non-beneficiaries with respect to their knowledge and adoption of improved farm technology. *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Bangalore, Karnataka.

Sidram, 2008, Analysis of organic farming practices in Pigeonpea in Gulbarga district of Karnataka state. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad(India).

Singh, K.P.M. and Singh, R.P., 1974, Impact of National Demonstration in the Adoption of Humoral Antibody Titres of Wheat, *Indian J. Extn. Edu.,* **10** (1&2) : 65-67.

Singh, S., 1978, Achievement motivation, decision making orientation of work values of fast and low progressing farmers in India. *The J. Soc. Psychol.,* **106**: 153-160.

Sowjanya, 2007, A comparative analysis of successful and unsuccessful self-help groups in Gadag district of Karnataka. *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Subramaniam, K.P., 1992, A Critical Analysis of National Demonstration on Sunflower Crop in Chitradurga District, Karnataka State, *M.Sc (Agri.) thesis (unpub.), Univ. of Agric. Sci*., Bangalore.

Sunilkumar, G. M., 2004, A study on farmer's knowledge and adoption of production and post harvest technology in Tomato crop of Belgaum district in Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Supe, S. V., 1969, Factors related to different degrees of rationality in decision-making among farmers in Buldana district. *Ph. D. Thesis, IARI*, New Delhi.

Suresh, R. J., 2004, Entrepreneurial behaviour of milk producers in Chittoor district of Andhra Pradesh – A critical study. *Ph. D. Thesis*, Acharya N. G. Ranga Agricultural University, Hyderabad.

Sureshkumar, 2009, A study on technological gap in recommended soybean cultivation practices. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Sushma. K. C., 2007, An analysis of entrepreneurship development in women through EDP trainings. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad (India).

Tawde, N. D., 1994, Utilization pattern of agricultural technology in tribal social system. *Maharashtra J. Extn. Edun.*, **13** : 241-244.

Thangavel, N.R., Subramanian, R. and Karthikayan, C., 1996, Characteristics of buffalo farmers. *Mah. J. Ext. Edu*. **7(1)**: 1307-1309.

Thippeswamy, R., 2007, A study on knowledge and adoption of plant protection measures in coconut cultivation by farmers of Chitradurga district. *M. Sc. (Agri.) Thesis,*Univ. Agric. Sci., Dharwad, Karnataka.

Thiranjangowda, B. T., 2005, A study on cultivation and marketing pattern of selected cut flowers in Belgaum district of Karnataka. *M.Sc. (Agri.) Thesis, Univ. of Agric. Sci.*, Dharwad, India.

Thyagarajan, S. and Vasanthakumar, J., 2000, Constraints to high yield in rice at farm level. *J. Ext. Edu.*, **11**(2): 2747-2753.

Vedamurthy, H. J., 2002, A study on the management of areca gardens and marketing pattern preferred by the arecanut growers of Shimoga district in Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Bangalore, Karnataka (India).

Veeraiah, A., Daivadeenam, P. and Pandey, R.N., 1998, Knowledge and adoption level of farmers trained in Krishi Vigyan Kendra about groundnut cultivation. *Indian. J. Extn.Ed.,*, **32** (1 & 2) : 58-63.

Venkatesh Prasad, G. and Sidda Ramaiah, B. S. 2000, Adoption of plant protection measures in paddy and groundnut crops. *Karnataka Journal of Agricultural Sciences,* 13(4) : 901-907.

Venkatesh Prasad, G., Sidda Ramaiah, B. S., Shivaramu, K. and Jamuna, K. V., 1999, Adoption of plant protection measures in paddy by the farmers. *J. Extn. Edun.*, **10**(1): 2305-2312.

Vijaykumar, K., 2001, Entrepreneurial behaviour of floriculture farmers in Ranga Reddy district of Andhra Pradesh. *M. Sc. (Agri) Thesis*, Acharya N.G. Ranga Agric. Univ., Hyderabad (India).

Vinay Kumar, R., 2005, Study on knowledge and adoption of rose growing farmers in Karnataka. *M.Sc. (Agri) Thesis*, Univ. of Agril. Sci., Dharwad (India).

Wagdhare, K., Depke, N.P. and Shade, P.V., 1998, Infomration source credibility among small farmers. *Maharashtra J. Extn. Edn.,* **14**: 520-521.

Wase, R. B., 2001, Knowledge and adoption of farmers about Jayanti chilli cultivation. *M. Sc. (Agri.) Thesis*, Dr. Punjabrao Deshmukh Krishi Vidyalaya, Akola. (India).

Yaligar, S. S. P., 1997, A study on soybean cultivation by farmers of Belgaum district an analytical study. *M.Sc. (Agri) Thesis*, Uni., of Agril. Sci., Dharwad (India).

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www. agropedia.iitk.ac.in

Appendices

"IMPACT ANALYSIS OF DEMONSTRATION ON TRANSPLANTING METHOD OF REDGRAM CULTIVATION IN BIDAR DISTRICT OF KARNATAKA" INTERVIEW SCHEDULE

Part-I **Respondent number:**

I. General information

1. Name of the farmer: _____2.Village: _____3. Taluka: _____

II. Personal, socio-economic and psychological characteristics

1. Age: _____years

2. **Education**: Illiterate/ Primary school / Middle school / High school / PUC / Degree

3. Farming experience: _____ years

4. Land holding (in acres)

Type of land	Owned	Leased in	Leased out	Total
Rainfed				
Irrigated				
Garden (Horticulture)				
Waste land				
Total				

5. Annual income (Rs.)

Sl. No.	Sources	Income(Rs.)
1.	Agriculture	
2.	Subsidiary	
3.	Other Sources	
Total		

6. Innovativeness

Sl.No.	Statements	SA	A	UD	DA	SDA
a.	I am very much interested in adopting whatever new practices that are helpful in farming					
b.	Since we are not sure of success of the new farming practices, I would like to wait till others adopt					
c.	Since new farming practices are not profitable I am not interested in any of new farming practices					
d.	I try to keep myself well informed about the improved farming practices and try to adopt as soon as possible					
e.	New farming practices are not easily adoptable and hence I do not adopt					

SA: Strongly Agree, A: Agree, UD: Undecided, DA: Disagree, SDA: Strongly disagree

7. Risk Orientation

Please indicate whether you agree or disagree with the following statements

Sl. No	Statement	Response	
		Agree	Disagree
1	A farmer should grow large number of crops to avoid greater risks involved in growing one or two crops.		
2	A farmer should rather take more of a change in making a big profit than to be content with a smaller but less risky profit.		
3	A farmer who is willing to take greater risks than the average farmer usually has better financial condition.		
4	It is good for a farmer to take risks when he knows his chance of success is high.		
5	It is better for a farmer not to try new farming methods unless most other farmers have used them with success.		
6	Trying an entirely new method in farming by a farmer involves risk, but it is worth.		

8. Achievement motivation:

Please indicate your degree of agreement or disagreement to the following statements

Sl. No.	Statement	Response		
		Agree	Undecided	Disagree
1	Work should come first even if one cannot get proper rest in order to achieve ones goals			
2	It is better to be content with whatever little one has, than to be always struggling for more			
3	No matter what I have done I always want to do more			
4	I would like to try hard at something which is really difficult even if it proves that I cannot do it			
5	The way things are now-a-days, discourage one to work hard			
6	One should succeed in occupation even if one has to neglect his family			

9. Scientific Orientation:

Please indicate your degree of agreement or disagreement to the following statements

Sl. No.	Statements	Response		
		Agree	**Undecided**	**Disagree**
1.	Improved practices give better yield than old practices			
2.	The way farmer's fore-farmers practiced agriculture is still the best way even today			
3.	Even a farmer with lot of experience should use improved practices			
4.	Though it takes lot of time for a farmer to learn improved production practices, it is worth the efforts			
5.	A good farmer experiments with new idea in farming			
6.	Traditional methods of farming have to be changed in order to raise the level of a farmer			

10. Extension Participation

1. Have you participated in any extension activities? Yes/No,

2. If yes, give details

Sl. No.	Name of the extension method	Extent of participation		
		Regularly	**Occasionally**	**Never**
a.	Training			
b.	Extension meeting			
c.	Demonstrations			
d.	Krishimela			
e.	Field day			
f.	Field visit			
g.	Group discussion			
h.	Educational tour			

11. Mass media utilization

Sl. No.	Mass media sources	Subscriber /Possessed	Programmes	Frequency of use		
				Regularly	Occasionally	Never
1	Radio		i) Agriculture Programmes			
			ii) General Programmes			
2	Television		i) Agriculture Programmes			
			ii) General Programmes			
3	News Paper		i) Agriculture Programmes			
			ii) General Programmes			
4	Magazine		i) Agriculture Programmes			
			ii) General Programmes			

12. Sources of Information:

Sl. No.	Sources of information	Consulted	Non-consulted
1	Agricultural assistant		
2	Assistant agricultural officers		
3	Agricultural officer		
4	Assistant Director of agriculture		
5	Agricultural university SMS		
6	Private agency extension officer		
7	Progressive farmers		
8	Neighbours		
9	Relatives		
10	Radio		
11	News paper		
12	Farm Magazine		
13	Television		

PART – B

KNOWLEDGE TEST QUESTIONS

Transplanting method of redgram cultivation practices

Sl. No.	Practices	Yes	No
	I. Nursery Management Practices		
1.	Do you know the recommended variety for transplanting of redgram cultivation? a. BSMR-736 b. Maruti (ICP-8863) c. Asha (IPCP-87119) d. Any other		
2.	Do you know the suitable soil for transplanting of redgram cultivation? a. Deep black soil b. Red soil c. Light textured sandy soil d. Any other		
3.	Do you know the recommended seed rate for transplanting of redgram (Kg/acre)? a. 1 b. 2 c. 3 d. 4		
4.	Do you know the seed treatment for transplanting of redgram cultivation? If yes give details a. With Calcium chloride @ 20 g per kg of seeds b. With Rhizobium @ 50 g per kg of seeds c. with trichoderma @ 4 g per kg of seeds d. With Phosphate solubalising bacteria @ 50 g per kg of seeds		
5.	Do you know the recommended size of the polythine bag for preparing seedling? a. 6" x 4" (l x b) with 200 µ gauge b. 4" x 2" (l x b) with 200 µ gauge c. 6" x 4" (l x b) with 100 µ gauge d. 4" x 2" (l x b) with 100 µ gauge		
6.	Do you know the materials required for filling the polythene bag? a. Soil b. Sand c. Compost d. All of these		
7.	How many seeds are placed in per polythene bag at what depth? a. 2 seeds with 1cm depth b. 1 seed with 1 cm depth c. 2 seeds with 2cm depth d. 1 seed with 2 cm depth		
8.	Do you know the thinning practice? a. one time b. 2 times c. 3 times d. 4 times		
9.	How many times water required for seedlings per day? a. One time b. 2 times c. 3 times d. 4 times		

10.	What is the recommended age of seedlings for transplanting redgram cultivation? a. 10-20 days old b. 20-30 days old c. 30-40 days old d. 40-50 days old		
	II. Main Field Management Practices		
11.	Do you start with summer ploughing for land preparation for transplanting of redgram cultivation? a. 2-3 times ploughing should be done in March-April b. 1-2 times ploughing should be done in March-April c. 2-3 times ploughing should be done in April-May d. 1-2 times ploughing should be done in April-May		
12.	Do you know the suitable month for transplanting of redgram cultivation? a. June b. July c. August d. May		
13.	Do you know the recommended quantity of FYM application (tonne/acre)? a. 5 b. 4 c. 3 d. 2		
14.	Do you know the proper time for FYM application? a. 3 weeks before transplanting b. 2 weeks before transplanting c. one week before transplanting d. 1 month before transplanting		
15.	Do you know the required depth of pit in main field? a. 5cm b. 10 cm c. 15 cm d. 20 cm		
16.	Do you know the recommended spacing for transplanting redgram cultivation? a. 5x3 ft b. 6x3 ft c. 7x3 ft d. 8x3 ft		
17.	Do you know the recommended total number of plants per acre? a.2904 b.2420 c.2054 d.1815		
18.	How many seedlings you will transplant per pit? a. 1 b. 2 c. 3 d. 4		
19.	Do you know the optimum dose of fertilizer for transplanting of redgram cultivation (Kg/Acre) NPK? a.10:23:50 b. 20:30:50 c. 30:20:40 d. 40:30:50		
20.	Do you know the soil application for transplanting of redgram cultivation? a.Znso4 @ 6 kg/acre b. Gypsum @ 45-50 kg/acre c. Both a & b d. Any other		
21.	Do you know the growth regulator for transplanting of redgram cultivation? If yes mention those _____		

22.	How many times irrigation required for transplanting method of redgram cultivation? a. 1-2 times b. 2-3 times c. 3-4 times d.4-5 times		
23.	Do you follow intercultivation? If yes how many times a. 1-2 times b. 2-3 times c. 3-4 times d. 4-5 times		
24.	Do you follw nipping practice? If yes how many times a. One time b. 2 times c. 3 times d. Dont know		
25.	Name the important pest in transplanting method of redgram cultivation. a. Pod borer (H. *armigera*) b. Pod fly c. Pod bug d. Maruka leaf webber		
26.	Name the control measures for pest management. a. Methomyl (40 SP) o.6 gm/lit (Lannate) b. Indoxacarb (14.5 SC) 0.3 ml/lit (Avaunt) c. Flubendiamide (480 SC) 0.1 ml/lit d. Spinosad (45 SC) 0.1 ml/lit		
27.	Indicates the important disease in transplanting method of redgram cultivation. a. Wilt b. Sterility mosaic c. Phytophthora Blight d. Leaf spot		
28.	Indicates the control measures for disease management. a. Carbendizim 50 WP 1.0 gm/lit b. Dicofol 20 EC 2.5 ml/lit c. Metalaxyl MZ 72 WP 2.0 ml/lit d. Mancozeb 45 WP 2.0 gm/lit		
29.	Do you know the crop grown as intercrop in transplanting redgram cultivation? a. Soybean b. Bajra c. Black gram d. Green gram		
30.	How much quantity of yield can be obtained in transplanting redgram cultivation? a. 12-14 quintals/acre b. 14-16 quintals/acre c. 16-18 quintals/acre d. 18-20 quintals/acre		

PART-III

Adoption pattern of transplanting method of redgram cultivation by the farmers

Sl. No.	Practices	Full Adopted	Partial Adopted	Not adopted
	I. Nursery Management Practices			
1.	Variety (BSMR-736)			
2.	Seed rate(1 Kg/acre)			
3.	Seed treatment (With trichoderma @ 4gm/kg of seeds)			
4.	Two seeds are in per polythene bag			
5.	Thinning practice (One times)			
6.	Water required for seedlings per day (1-2 times)			
7.	Age of the seedling (30-40 days old)			
	II. Main Field Management Practices			
8.	Summer ploughing 2-3 times ploughing should be done in March-April			
9.	Transplanting time (June)			
10.	FYM application (5 tone/acre)			
11.	Time for FYM application (3 weeks before transplanting)			
12.	Recommended spacing (6x3 ft)			
13.	Total number of plants per acre (2420 plants/acre)			
14.	Depth of pit in main field (15 cm)			
15.	One seedling transplant per pit			
16.	Recommended dose of fertilizer (10:23:50 kg/acre NPK)			
17.	Soil applications (Gypsum @ 45-50 kg/acre)			
18.	Growth regulator (NAA (planofix) @ 0.5 ml/lit of water)			

<table>
<tr><td>19.</td><td>Irrigation required (3-4 times)</td><td></td><td></td><td></td></tr>
<tr><td>20.</td><td>Nipping practice (After 20-30 days of transplanting)</td><td></td><td></td><td></td></tr>
<tr><td>21.</td><td>Intercultivation practices (1-2 times)</td><td></td><td></td><td></td></tr>
<tr><td>22.</td><td>Pest management
<table>
<tr><th>Sl. No.</th><th>Name of the pest</th><th>Control measures</th><th>Quantity</th></tr>
<tr><td>a.</td><td></td><td></td><td></td></tr>
<tr><td>b.</td><td></td><td></td><td></td></tr>
<tr><td>c.</td><td></td><td></td><td></td></tr>
<tr><td>d.</td><td></td><td></td><td></td></tr>
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<tr><td>23.</td><td>Disease management
<table>
<tr><th>Sl. No.</th><th>Name of the Disease</th><th>Control Measures</th><th>Quantity</th></tr>
<tr><td>a.</td><td></td><td></td><td></td></tr>
<tr><td>b.</td><td></td><td></td><td></td></tr>
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<tr><td>d.</td><td></td><td></td><td></td></tr>
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<tr><td>24.</td><td>Intercrop in transplanting of redgram cultivation</td><td></td><td></td><td></td></tr>
<tr><td>25.</td><td>Yield obtained</td><td></td><td></td><td></td></tr>
</table>

Constraints in adoption of transplanting method of redgram cultivation by the farmers

1. _____

2. _____

3. _____

4. _____

5. _____

Cost of cultivation of transplanting method of redgram

SI. No.	Particulars	LABOUR						INPUT USED				TOTAL (Rs)
		Men		Women		Animal/ Tractor (Hrs)	Total (Rs)	Units/ quantity per acre	Total Units/ quantity	Unit Cost (Rs)	Total Cost (Rs)	
		N	D	N	D							
A	**Summer Ploughing**											
B. Nursery												
1.	Seedling preparation											
2.	FYM application											
3.	Seed											
4.	Seed treatment											
5.	Fertilizer application											
6.	Thinning Practices											
7.	Irrigation management											
C. Main field												
1.	Land preparation											
2.	FYM application											
3.	Fertilizer application											
4.	Micronutrients application											
5.	Seedling treatment											

6.	Transplanting											
7.	Nipping practices											
8.	Irrigation management											
9.	Weed management											
10.	Pest & disease management											
11.	Harvesting											
12.	Marketing											
13.	Others											
											TOTAL	

N-Number D-Days

Yield & Returns

Sl. No.	**Particulars**	**Quantity (Qt)**	**Price (Rs./Qt)**	**Amount**
1	Main product			
2	By product			
3	Gross returns (Rs)			
4	Net returns (Rs)			

IMPACT ANALYSIS OF DEMONSTRATION ON TRANSPLANTING METHOD OF REDGRAM CULTIVATION IN BIDAR DISTRICT OF KARNATAKA STATE

RAMAKRISHNA S HOSAKOTI **2012** **Dr. S. K. METI**
MAJOR ADVISOR

ABSTRACT

The present research study was conducted in Bidar district of Karnataka during the year 2011-12. Bidar district was purposively selected for the study, since the area under transplanted redgram cultivation is highest and maximum number of demonstration is conducted by KVK, Bidar. Three taluks namely, Humnabad, Bidar, and Aurad were purposively selected with one hundred and twenty respondents, because these taluks have highest area under transplanting method of redgram cultivation practices. Thus 120 farmers formed the sample for study (i.e. 60 demonstration and 60 non-demonstration farmers).

Study revealed that, overall knowledge level about transplanting method redgram cultivation practices (50.00% and 30.00%) in case of demonstration and non-demonstration farmers, respectively. Regarding overall adoption level of transplanting method redgram cultivation practices, 48.33 and 28.33 per cent of demonstration farmers and non-demonstration farmers were belongs to medium adoption category, respectively.

It was observed that, in case of demonstration farmers' viz., education, land holding, annual income, Innovativeness, risk orientation achievement motivation, mass media utilization, extension participation, and sources of information exhibited positive and significant relationship. In case of non-demonstration farmers independent variables i.e. education, land holding, annual income, risk orientation, achievement motivation, scientific orientation, mass media utilization, extension participation, and sources of information exhibited positive and significant relationship with their adoption of transplanting method redgram cultivation practices.

It was observed that, constraints as expressed by the demonstration farmers were majority of expressed that low price to the product (78.33%). In case of non-demonstration farmers they had expressed constraints like 81.67 per cent of them had problems of high cost of cultivation practices.