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**ORGANIC AGRICULTURAL PRACTICES IN  
COCONUT BASED HOMESTEADS IN  
THIRUVANANTHAPURAM DISTRICT**

**J. K. J. P. JAYAWARDANA**

**Thesis submitted in partial fulfillment of the requirement  
for the degree of**

**Master of Science in Agriculture**

**Faculty of Agriculture  
Kerala Agricultural University, Thrissur**

2007



**DEPARTMENT OF AGRICULTURAL EXTENSION  
COLLEGE OF AGRICULTURE  
VELLAYANI, THIRUVANANTHAPURAM - 695 522**

*Dedicated*

*to*

*my loving son*

*Rahul*

## DECLARATION

I hereby declare that this thesis entitled "**Organic agricultural practices in coconut based homesteads in Thiruvananthapuram District**" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.



Vellayani,

27.10.07

**J. K. J. P. Jayawardana**

(2005-11-146)

## CERTIFICATE

Certified that this thesis entitled “**Organic agricultural practices in coconut based homesteads in Thiruvananthapuram District**” is a record of research work done independently by Mr. J. K. J. P. Jayawardana (2005-11-146) under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to him.



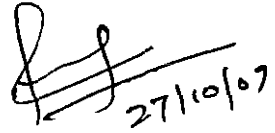
Vellayani,  
27.10.07

**Dr. A. K. SHERIEF**  
(Chairman, Advisory Committee)  
Associate Professor,  
Department of Agricultural Extension  
College of Agriculture, Vellayani  
Thiruvananthapuram – 695 522.

Approved by

**Chairman :**

**Dr. A. K. SHERIEF**  
Associate Professor,  
Department of Agricultural Extension,  
College of Agriculture, Vellayani,  
Thiruvananthapuram – 695 522.



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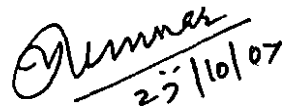
**Members**

**Dr. S. MOTHILAL NEHRU**  
Professor and Head,  
Department of Agricultural Extension,  
College of Agriculture, Vellayani,  
Thiruvananthapuram – 695 522.



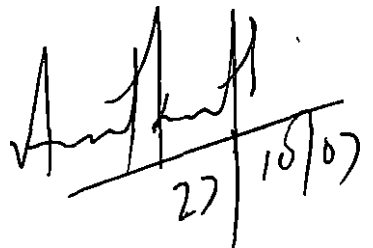
27/10/07

**Dr. VIJAYARAGAVAKUMAR**  
Professor,  
Department of Agricultural Statistics,  
College of Agriculture, Padannakkad,  
Kasargod.



25/10/07

**Dr. A. S. ANILKUMAR**  
Associate Professor,  
Instructional Farm,  
College of Agriculture, Vellayani,  
Thiruvananthapuram – 695 522.



27/10/07

**External Examiner :**

**Dr. M. VETRI SELVAN**  
Professor of Extension,  
Faculty of Agriculture,  
Annamalai University,  
Tamil Nadu.



27/10/07

## ACKNOWLEDGEMENT

I wish to place on record on record my deep sense of immeasurable gratitude to Dr. A.K. Sherief, Chairman of the Advisory Committee and Assistant Professor, Department of Agricultural Extension, College of Agriculture, Vellayani for his invaluable guidance, untiring interest and immense help rendered throughout the course of this investigation. I consider myself fortune to have been associated with him. Above all I express my sincere gratitude to him for the love and affection he rendered on me during the entire course.

I take this opportunity to express my sincere gratitude to Dr. S. Mothilal Nehru, Head, Department of Agricultural Extension for the timely help and valuable guidance all through the periods of the study.

I am particularly grateful to Dr. C. Bhaskaran, Associate Professor, Former Head, Department of Agricultural Extension for his valuable advice, keen interest, love and affection, constructive criticisms and help during all stages of the study as well as my post graduate programme.

I wish to place my gratefulness to Dr. Vijayaraghava Kumar, Associate Professor, Department of Agricultural Statistics for his wholehearted effort, friendly approach in selecting the study area, statistical analysis and interpretation of the results.

I am greatly privileged to acknowledge my heartfelt thanks to Dr. A.S. Anilkumar, Assistant Professor, Instructional Farm, College of Agriculture, Vellayani for his valuable guidance, help suggestions, friendly approach and advice rendered throughout the course of work.

My heartfelt thanks to Agricultural Extension Professors, Dr. R. Prakash, Dr. N. Kishorekumar, Dr. S. Shylaja, Dr. N. Kumari Sushama, Dr. A. Anilkumar,

Dr. V.B. Padmanabhan, Dr. Shakeer Hussain and Dr. B. Seema for their friendly approach, creative suggestions and constant encouragement rendered to me during the course of my investigation.

I wish to place on record my deep sense of gratitude to all the non teaching staffs of my department for their help and support.

I wish to place on record my deep sense of gratitude to Council of Agricultural Research Policy (CARP) in Sri Lanka for awarding me a scholarship to complete my postgraduate programme in Kerala, India.

I am gratefully acknowledge Chairman, Director, Head, Technology transfer Division and all the staff of Coconut Research Institute in Sri Lanka for granting me study leave and arranging all the requirement for completing my post graduate programme.

I am gratefully indebted to Agricultural Officers of Kalliyoor, Venganoor and Kuzhimulam panchayats for their valuable help and important suggestions during my survey.

I am gratefully acknowledge all the coconut based homestead growers of the study area who responded me for their cooperation without which my study would perhaps have been incomplete.

I wish to express my sincere thanks to my classmate S. Suresh Kumar for his good company, moral support and especially in translating the questionnaire to Malayalam.

Words are scarce to express my loving thanks and deep sense of gratitude to my dear friend V.G. Jithesh, Ph.D. scholar, Department of Plant Breeding for his valuable assistance, help to conduct my survey successfully, constant encouragement, moral support and friendly approach throughout the study.

I would like to express my heartiest thanks to Jhony and Nileema, to help me for conducting survey and constant encouragement.

I am also most grateful to Geetha. G. Nath and Nazreen Hhussain for their constant encouragements, valuable suggestions and kindness throughout my study.

I would live to take this opportunity to express my heartfelt thanks to Prabhu, Gurubalan, Mathew, Priya, Manjusha, Kumaran, Bhaviya, Gopika and all the P.G. students and Ph.D. scholars of the Department of Agricultural Extension for their support, motivation help and affection at times of need.

I am thankfully acknowledge all the friends in P.G. hostel for their encouragement and support.

I am very much thankful to M/s. Athira Computers, Kesavadasapuram, Thiruvananthapuram, for prompt computerized typesetting of thesis with good care.

I owe my loving thanks to my beloved wife Mrs. Thushari Sudasingha and my loving Son Master Rahul for their great understanding, dedication, caring words and extreme patience which was a moral booster for completing my P.G programme. Her emotional encouragement during my difficult moments is thankfully remembered.

At this juncture with my whole being I thank my parents and my brother for enormous support rendered by them and also the responsibilities and sufferings shared by them during the entire period of my study in abroad.

With heavy heart I wish to place on record of my affection and respect to my "Aththamma" late Mrs. R.M. Koinmenike who encouraged me for most of my endeavors right from childhood.

**J.K.J.P. JAYAWARDANA**



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# INTRODUCTION

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# 1. INTRODUCTION

It is well known now that increased use of chemical pesticides and fertilizers have created chain of problems of soil, environment and water degradation. The intensive chemical agriculture that has been followed during green revolution is causing heavy pollution of our food, drinking water and air. The life expectancy has improved, but the quality of life has substantially deteriorated. The rural economy is in ruins because of over dependence of purchased inputs, such as seed, fertilizers, pesticides, growth promoting chemicals etc. It is even said that the chemical agriculture has destroyed our ability to think about right way to go forward. Fortunately, alternatives to chemical agriculture are available in organic farming approaches.

Organic agriculture is a system of farming based on integrated relationship among soil, water, plant and micro flora. It creates productive landscapes and successfully reconciles food production and environmental conservation. Organic management relies on local human resources and knowledge to enhance natural resources processes, respecting ecological carrying capacities. By reducing dependence on off-farm inputs and creating more balanced nutrient and energy flows, ecosystem resilience is strengthened, food security is increased and additional incomes are generated. Organic agriculture responds positively to all sustainable agriculture and rural development objectives and helps in maintaining soil fertility, improve crop production and socio-economic condition of the farmers.

Coconut is unique in all aspects among the horticultural crops grown in the country. It is a source of food, drink, shelter and its raw materials are used for industrial purposes. This crop assumes considerable importance in the national

economy in view of the income and employment potential for rural population. Coconut is one of the most important cash crops grown in Kerala, and it plays a very unique role in the socio-economic development of the state.

Garden land agriculture is common in all the major agroecological regions in Kerala. Its characteristic feature is the predominance of homesteads and homestead farming. A homestead is an operational farm unit in which a number of crops major crop is coconut are grown with livestock, poultry, and / or fish mainly for the purpose of satisfying the farmer's basic needs (Nair and Sreedharan, 1986). It normally ranges in size from 0.02 ha to 0.2 ha. Smaller units of less than 0.02 ha and larger ones of above 0.2 ha are also not uncommon. The homesteads in Kerala present a tree based farming system with coconut as the major component. The coconut based farming system represents a typical agroforestry model in which seasonal and annual agricultural crops are intercropped in combinations with a diverse but compatible group of trees and shrubs with or without the association of livestock components and, to which the contribution of the family labour is an essential input. The system is a complex but sustainable land use model in which trees, shrubs, agricultural crops and / or livestock exist in perfect harmony with each other yielding two or more outputs from the same operational unit. It has both economic and ecological advantages to the extent that multiple sources of food, income and employment are generated from a unit area and the ecological base of agriculture is adequately safeguarded. In spite of the fact that Kerala has the status of primary coconut producing state, the productivity is very low. The yield in Kerala is only 5016 nuts per hectare when compared to the all India average of 6148 nuts per hectare. Several reasons are attributed for low productivity such as traditional method of cultivation, lack of manuring and irrigation practices, etc. (Muliyar, 1989).

Most of the coconut production comes from small and marginal farmers. Only limited percentage of farmers use chemical fertilizers and as a result vast majority of palms remain under unfertilized or under-fertilized conditions.

Continuous use of chemical fertilizers results in increased soil acidity, imbalance of major and micronutrients and decrease in soil biological properties. The situation demands application of low cost organic nutrient sources, which will help in improving the soil fertility and productivity. There is increasing global demand for organically grown agricultural products. Coconut is one of the plantation crops on which extensive studies have been made on organic recycling in India (Nampoothiri, 2001). As coconut is the main crop of the homesteads, prime attention should be given to improve the health and productivity of the palms.

Emphasizing these enormous potentials in coconut based homesteads, this research study was conducted with the following objectives to,

1. Study the profile characteristics of coconut based homestead farmers
2. Study the extent of awareness of the farmers about organic farming practices
3. Study the extent of knowledge of the farmers about organic farming practices
4. Study the attitude of the farmers towards organic farming
5. Study the extent of adoption of organic farming practices by the farmers
6. Study the constraints faced by the farmers in the adoption of organic farming practices.

### **Scope of the study**

The study would be of great help to the Kerala State Department of Agriculture and other coconut related development departments for the

formulation and implementation of various development programmes and schemes on organic farming practices. Information on the extent of awareness, knowledge, attitude and adoption of organic farming practices by coconut homestead farmers will reveal the efficiency of the ongoing activities for popularizing organic farming practices. The study will help the development officers to modify their strategies to motivate coconut homestead farmers to adopt organic farming practices and to overcome the constraints. This study would be of immense help for the planners, administrators, researchers and extension functionaries to develop and implement suitable policies and strategies for sustainable agricultural development in Kerala.

### **Limitations of the study**

The study forms a part of the Master's degree programme of the student researcher and hence it has all the limitations of time, money and other resources. Consequently the researcher was unable to extend the study to all parts of the state. No human effort is free from limitations. This study is no exception. However, sincere attempts have been made to carry out the research as systematically as possible.

### **Presentation of thesis**

Besides the present introduction chapter, the second chapter namely theoretical orientation deals with the review of important and related studies in the areas of present investigation. The third chapter presents the methodology used in the study. Location of the study area, sampling procedure followed, quantification of variables selected for the study and statistical techniques employed are dealt within this chapter. The fourth chapter contains results and discussion of the study. The last chapter summarizes the study with implications and suggestions for future research. The appendices and abstract of the thesis are given at the end.

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# THEORETICAL ORIENTATION

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## 2. THEORETICAL ORIENTATION

The researchers recently have been paying more attention to the need and importance of organic farming practices, as it is an important aspect of sustainable agriculture. The present research programme is the first of its kind in organic farming practices in coconut based homesteads in Kerala. Hence only a few research findings are available in this emerging field. Keeping this in view, a comprehensive review of the previous research studies related to the topic has been done in accordance with the objectives of the present study and is presented under the following sub headings.

- 2.1 Concept of organic farming
- 2.2 Definition of organic farming
- 2.3 Need for organic farming
- 2.4 Objectives of organic farming
- 2.5 Concept of homesteads
- 2.6 Relevance and suitability of organic farming in coconut cultivation and research findings
- 2.7 Studies on coconut based cropping systems
- 2.8 Profile characteristics of coconut based homestead farmers
- 2.9 Extent of awareness about organic farming practices
- 2.10 Extent of knowledge about organic farming practices
- 2.11 Attitude towards organic farming practices
- 2.12 Extent of adoption of organic farming practices
- 2.13 Constraints in the adoption of organic farming practices
- 2.14 Conceptual framework of the study

## 2.1 CONCEPT OF ORGANIC FARMING

Singh *et al.* (2000) reported that organic farming means farming in the spirit of organic relationship and the concept of organic farming is dubious to the farmers of developing countries. In India, it implies the use of organic manures and no use of synthetic fertilizers and chemical pesticides.

Bhattacharyya and Krishna (2003) stated that organic farming is not of recent origin in India. It dates back to ancient period during Indus Valley Civilization and its mention was made in Rigveda, Atherva Veda and Kautilya's Arthashastra. There was use of green manures, oil cakes and animal excreta. Patra *et al.* (2004) reported that organic farming is a paradigm shift from conventional centralized to strategic holistic approach. In the concept, the main aim of organic farming remains sustaining crop productivity, achieving a closed nutrient cycle in the farm, maintaining soil fertility and animal welfare and in doing so, synthetic chemicals whether fertilizer or plant protectant are not supposed to be used. Cultivation of less susceptible crop rotation and use beneficial species and mechanical measures for plant culture is the key component of plant protection, nutritional requirement is made through organic means.

Pradeepkumar *et al.* (2004) reported that organic agriculture includes all agricultural systems that promote the environmentally, socially and economically sound production of food and fibres. These systems take local soil fertility as a key to successful production. Organic farming is a holistic system of farm design and management that seeks to create a healthy ecosystem which sustains profitability.

Anandakrishnaveni and Balamurugan (2002) reported that organic farming is the backbone of sustainable agriculture. It mainly depends on organic waste recycling. Wastes are also very useful, if properly utilized. Organic farming is the way to recycle the farm wastes into agricultural systems to get minerals and nutrients in place of chemical fertilizers.

## 2.2 DEFINITION OF ORGANIC FARMING

U.S. Department of Agriculture has defined organic farming as “a system that is designed and made to produce agricultural products by the use of methods of substances that maintain the integrity of organic agricultural products until they reach the consumer”. This is accomplished by using wherever possible cultural, biological and mechanical methods, as opposed to using these substances to fulfill any specific fluctuations within the system. This is done to maintain long term soil biological activity, ensure effective pest management, recycle wastes to return nutrients to the land, provide alternative care for farm animals and handle the agricultural products without the use of extraneous synthetic additives or processing in accordance with the act and regulations in this part (USDA, 1980).

Organic agriculture is a unique production management system which promotes and enhances agro eco-system health, including biodiversity, biological cycles and soil biological activity and this is accomplished by using on-farm agronomic, biological and mechanical methods and exclusion of all synthetic off-farm inputs (FAO, 1993).

Organic farming is a farming of integration of biological, cultural and natural inputs including integrated disease and pest management practices. It not only advocates stopping or restricting the use of chemical fertilizers, pesticides, weedicides and other chemicals but also emphasizes the need for farming which should create an ecological balance and micro-environment suitable for health and growth of soil micro-flora, plants, animals, farm workers and finally the vast population which consume the farm produce (Harendar *et al.*, 1996).

Organic farming is defined as a holistic management system which promotes and improves the health of the agro-system related to biodiversity, nutrient biocycles and soil microbial and biochemical activities. Organic farming



emphasizes management practices involving substantial use of organic manures and green manures (Gaur, 2001).

Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators and livestock feed additives. To the maximum extent feasible, organic farming systems rely upon crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, mechanical cultivation, mineral bearing rocks and aspects of biological pest control to maintain soil productivity and tilth to supply plant nutrients and to control insects, weeds and other pests (Lampkin, 1990).

Organic farming is a production system which favours maximum use of organic materials (Crop residues, animal wastes, legumes and off-farm organic wastes, growth regulators, biopesticides etc.) and discourages use of synthetically produced agro-inputs for maintaining soil productivity and fertility and pest management under conditions of sustainable natural resources and healthy environment (Dahama, 2003).

### 2.3 NEED FOR ORGANIC FARMING

Organic farming is the need of the hour in the present day context of serious threat to our ecology and environment. Great harm is being caused due to large scale pollution of our soil, water and air which have resulted in degradation and loss of these natural resources and a declining trend has set in the productivity of our soils. Chemical agriculture with a heavy dependence on fertilizer and pesticides is affecting the quality and safety of produce and well being of humanity. For a sound future, organic farming offers a dynamic interaction between soil, plants, animals, humans, ecosystems and environment (Daniel, 1996).

Chemicals save the crops from their enemies at the same time they also kill many predators, insects and bio-agents acting as bio-pesticides and bio-fertilizers.

The indiscriminate use of pesticides has led to serious consequences like harmful residues, pest resistance to pesticides, pest resurgence and outbreak of secondary pests. The residual effect of some herbicides inhibits nodulation of legume crops. In many cases, the toxins of pesticides and herbicides are absorbed by plants and passed into the food chain. The honeybees, nature's pollinating agents have become rare as a result of widespread use of pesticides (Sreekrishna, 1999).

The food containing pesticides and other chemicals are increasingly made obvious by many research studies revealing the presence of pesticides poisoning and 20,000 people die every year due to toxic effects of these chemicals worldwide, but the crop loss due to pest is still Rs. 15,000 crores apart from killing portion of the human population (Sharma, 2002).

India has succeeded in green revolution with the introduction of high yielding varieties of various crops and by following intensive cultivation practices with the use of fertilizers, pesticides, fungicides and other inputs. All these agrochemicals are produced from non renewable fossil fuel. In future diminishing availability of these inputs may not only cost heavily on our foreign exchange, but also limit agricultural production (Bai and Suresh, 2000).

In India the demand for organic produce increases year after year, particularly in international trade market. Organic produce will help us to avoid the dumping of thousands of tonnes of agrochemicals every year, and will give us residue free food, save environment from pollution and provide better living standards (Sujit, 2003).

## 2.4 OBJECTIVES OF ORGANIC FARMING

As embodied in the International Federation of Organic Agriculture Movement (IFOAM) basic standards for organic agriculture and food processing, the principle aims of organic farming are :

1. To produce food of high nutritional quality in sufficient quantity.
2. To interact in a constructive and life enhancing way with natural systems and cycles.
3. To encourage and enhance biological cycles within the farming system involving microorganisms, soil flora and fauna.
4. To maintain and increase long-term fertility of soils.
5. To prepare the healthy use and proper care of water, water resources and all life therein.
6. To help in the conservation of soil and water.
7. To use as far as possible, renewable resources in locally organized agricultural systems.
8. To work with materials and substances that can be reused or recycled either on the farm or elsewhere.
9. To give all livestock life conditions which allow them to perform the basic aspects of their innate behaviour.
10. To minimize all forms of pollution that may result from agricultural practices.
11. To maintain the genetic diversity of the end it's surroundings including the protection of plants and wildlife habits.
12. To allow everyone, involve in organic production and processing, a quality of life that conforms to the human rights character, to cover their basic needs and obtain an adequate return and satisfaction from their work including a safe working environment.

13. To consider the wider social and ecological impact of the farming system.
14. To produce non-food products out of renewable resources, which are fully bio-degradable (Angelina, 1997).

According to Blake (1987) the objectives of organic agriculture are

- i) Organic agriculture aims to be in harmony rather than in conflict with natural systems. The powers of nature are harnessed and developed to their fullest extent, rather than dominated.
- ii) It adopts an approach that minimizes the use of non-renewable forms of energy.
- iii) Organic foods aim to be of optimum nutritional value
- iv) The organic world strives to be localized. Local markets, decentralized systems of distribution and processing are sought.
- v) Organic agriculture does not pollute the environment.

## 2.5 CONCEPT OF HOMESTEADS

A homestead is an operational farm unit in which a number of crops, including tree crops, are grown with livestock, poultry and or fish production, mainly for the purpose of satisfying the farmer's basic needs (Nair and Sreedharan, 1986).

Homestead is the home and its adjoining land owned and occupied by the household including the immediate area surrounding the dwellers unit and the space used for cultivation of trees and vegetables (Hanman, 1986).

Ruthenberg (1971) distinguishes garden cropping from field production by the following characteristics.

- Growing plants for home consumption that can not be supplied by arable farming
- Small plots
- Proximity to the dwelling
- Fencing or compound wall
- Mixed or dense planting of an array of annual and perennial crops
- High intensity of land use
- Land cultivation several times a year
- Permanence of cultivation
- Cultivation with hand implements

Homestead farms may not have all the above characteristics and may vary in space and time.

Jacob and Alles (1987) reported that the Kandyan gardens in Sri Lanka represented a home garden system practised in small holdings and their size varied from 0.4 to 2.0 ha, with an average of 1 ha. The most important tree crops in the system were arecanut, jack and coconut. The highest number of crops grown on a farm was 18 and the lowest four. Eighty per cent of the farms had 8-15 crops.

Homesteads are very complex systems with a very sophisticated structure and a large number of components. This type of system display many agroforestry concepts, the intimate mix of diversified agricultural crops and multipurpose trees, livestock and other enterprises, which fulfills most of the fundamental needs of the local population (Fernandes and Nair, 1988).

According to Salam *et al.* (1989), agriculture system practised around the home with annual and perennial crops along with or without livestock, poultry and / or fish for the purpose of meeting the fundamental requirements of the home, viz., food, fodder, fuel and timber and also for generating additional income through sale of surplus to purchase the items non-produceable in the homestead. This particular type of agricultural production system is unique to the state of Kerala, where the average size of holdings is comparatively small. The homestead agriculture of Kerala often combines crop farming and livestock farming, ensuring a synergistic interaction between the components.

Salam and Sreekumar (1990) highlighted the importance of crop livestock integration of coconut based mixed farming system, to sustain its productivity..

The food, fodder and fuel requirements of the home are expected to be met to a great extent. The canopy configuration provided by the multistructured annual, perennial crop combination ensured better exploitation of the space and solar energy. The different roots spread of the polyculture enables to exploit the soil at different depths which may result in better utilization of water and nutrients (Salam *et al.*, 1992).

## 2.6 RELEVANCE AND SUITABILITY OF ORGANIC FARMING IN COCONUT CULTIVATION AND RESEARCH FINDINGS

Nampoothiri (2001) reported that coconut is one of the plantation crops, on which extensive studies have been made on organic recycling in India. It is therefore taken as a case study to bring home the possibility of organic farming in plantation crops.

Bidappa *et al.* (1996) reported that from a well managed coconut garden 6 to 8 tonnes of organic matter/ha/year becomes available in the form of leaves, spathe, bunch waste and husk. The values for organic carbon, available N, Fe, Mn and exchangeable Ca and Mg were higher for soils receiving organic manures.

Varghese *et al.* (1978) reported that, in the mixed cropping of cocoa in coconut plantation, it has been estimated that 818 and 1785 kg/ha/year of dry matter is additionally obtained from single and double hedge systems respectively.

Thomas and Shantaram (1984) reported that performance of legumes in coconut basins, *P. phaseoloides*, *M. invisa* and *C. mucomoides* were found to be superior yielding 15-28 kg of biomass and 100-200 g N in the 1.8 m radius basin area during a growth period of 140-150 days during the monsoon season.

Mohan *et al.* (1989) reported that in coconut the rhinoceros beetle can be effectively controlled by releasing baculovirus infected beetles. The green muscardine fungus, *Metarhizium anisopliae* is another biocontrol agent, which infects all stages of rhinoceros beetle. A common weed, *Clerodendron infortunatum* has also been found effective in the control of rhinoceros beetle.

Sathiamma *et al.* (1996) reported that effective control of leaf eating caterpillar has been obtained with the use of larval parasitoids, *Apantees teragamae* and *Goniozis nephantidis*, as well as pupal parasitoid, *Bachymeria nosatoi*.

Iyer and Nambiar (1998) reported that bio-control measures have also been developed for managing diseases of coconut.

Thomas *et al.* (2001) reported that a technology has been standardized for utilization of coir pith for vermicompost production using the local epigeic earth worm *Eudrillus* sp. Studies at CPCRI resulted in the identification of a number of highly efficient fungi effective in biodegradation of coir pith. A technology involving treatment with lime and rock phosphate with the inoculation of *Maransmiellus troyanus* and *Trichoderma* sp. has been standardized.

Subramanian *et al.* (2000) reported that Glyricidia as a green manure, in between two rows of coconut palms with three prunings per year resulted in higher biomass production of 7970 kg/ha/year and to mitigate the poor physiochemical properties of coastal sandy soil, investigations have been succeeded on the effect of growing Glyricidia in between the coconut rows with different planting densities and pruning intensities.

Khan *et al.* (2002) reported that as a number of component crops are involved, soil resources are utilized to the maximum extent and as the biomass production per unit area is very high, soil health and coconut yield can be sustained even in the absence of external input when the available organic wastes are recycled.

Prabhu *et al.* (2000) reported that coconut is one of the most amenable crops for organic farming and a number of agrotechnologies are now available for organic cultivation.

Nair *et al.* (1998) reported that a number of eco-friendly technologies are available for pest and disease control in coconut.

Maheswarappa *et al.* (1998) reported that there was effective build up of organic carbon N, P, K and Fe status in soil, when the waste biomass was recycled in the garden. Coconut based mixed farming of 1.2 ha involving coconut, grasses, dairy, poultry and rabbitry, 15 tonnes of farm yard manure, 2 tonnes of poultry manure as well as 50,000 litres of cow urine and cowshed washing were obtained annually. If effectively recycled, these can supply 125 kg of N, 78 g P<sub>2</sub>O<sub>5</sub> and 115 kg K<sub>2</sub>O.

## 2.7 STUDIES ON COCONUT BASED CROPPING SYSTEMS

Meerabai *et al.* (1991) reported that coconut based farming system is commonly practiced in the homestead agriculture especially in coastal and mid-



land areas of Kerala. The by products of coconut viz., petiole, frond, stipules, spadix (bunch stalk and spathe), husk and shell are mainly used as energy source (by burning) for rural cooking and these meet the fuel requirement of the farm family to a greater extent.

Santha *et al.* (1991) reported that farmers preference for local varieties since the hybrid varieties were grown only by 15.35 per cent of the sample farmers. The use of hybrid varieties showed an increasing trend with the increase in the holding size. The selection of mother palms was not done by 27.27 per cent of the farmers due to lack of awareness whereas 27.27 per cent feel that bigger nuts from harvest are better seed nuts. The study pointed out that the extent of adoption of most of the seedling practices in coconut was very low.

Santha *et al.* (1993) observed that most of our coconut palms grow in soils deficient in plant nutrients. Even in inherently fertile lands, the absence of the regular manuring will affect productivity. The recommended dosage of organic manures is 15-25 kg per palm. On an average the farmers were using 47 kg per palm which is 88 per cent more. However it is interesting note that 71.36 per cent of the sample farmers were not applying any organic manures at all. Adoption according to the recommendation was only to the extent of 4.98 per cent whereas 6.64 per cent used organic manures in excess. Among the different size groups maximum quantity of organic manures was applied by the 0.61 to 1.2 ha size of holding and followed by less than 0.2 ha size of holding which was 73 kg and 51 kg respectively. 21.99 per cent of the farmers opined that it is not necessary to apply organic manures for coconut. Apart from these 10.79 per cent were not aware of the recommendation and 8.71 per cent were not convinced about the benefits of applying organic manures. Moreover the high cost of manures prevented 4.97 per cent of the sample farmers from adoption. The use of coconut husk as fuel was cited as the major constraint (64.36 per cent) for not adopting husk burial. 11.4 per cent of the farmers were of the opinion that it is not practicable to irrigate adult palms without development of proper irrigation system. The study has revealed a

technological gap in the adoption of recommendations in the maintenance of coconut palms. Farmers usually give little care for the crop as the crop offers some yield even without adopting the technologies.

Thampan (1996) reported that the scope and advantages for mixed farming in coconut garden involving cultivation of shade tolerant fodder crops in the interspaces of coconut and integrating animal enterprises and recycling the by products.

Sairam (1997) reported that, in the coastal areas, coconut is grown intervened by patches of cocoa, tobacco and paddy. Coconut is mostly intercropped with black pepper, cocoa, cinnamon, clove and coffee. It was observed that when coconut is intercropped, the production of nut per palm increases. Besides, mixed farming provides coconut farmers with a higher return per hectare than monoculture.

According to Muralidharan *et al.* (1999) coconut occupies a unique position in the farming community of Kerala. In the last decade, Kerala faced 50 per cent short of food crops because commercial crops like rubber, vanilla are cultivated more than food crops, mainly rice. The state has unique cropping pattern. It accounts for 92 per cent of India's rubber production, 45 per cent of coconut production, 60 per cent of tapioca production and almost 100 per cent of lemon grass oil production. Coconut cultivation is occupying the largest cropped area followed by rubber and cashew.

Thamban *et al.* (2006) reported that according to farmers, lack of labour and high wage rate also pose problems in the effective maintenance of Coconut Based Farming Systems (CBFS). Skilled labour for coconut and arecanut harvesting is scarce and costly. Lack of availability of organic manures and their high cost of another problem adversely affecting the sustainability of CBFS. Adoption of recommended practices of vermicomposting of organic wastes available in CBFS would be a potential way to overcome this difficulty. This would enhance the efficiency of organic recycling for sustainable maintenance of CBFS.

Jnanadevan and Prakash (1992) reported that extent of adoption of chemical fertilizers among coconut growers was very low. Only 5 per cent of the farmers secured adoption score in the range of 80-100. This indicates that 42.5 per cent of the farmers apply 20 per cent or less of the recommended dose of fertilizers and none of the growers apply full dose of the fertilizers according to the package of practice recommendations of Kerala Agricultural University.

Priya (2003) reported that organic farming was being adopted at an increased level and organic fertilizers are considered as key for quality maintenance of products than chemical fertilizers.

Several reasons or constraints were identified by workers in the research and development organizations responsible for low productivity of the coconut crop in Kerala. Low adoption of fertilizers is one of the major reasons (Muliya, 1989).

Job *et al.* (1993) in their study to analyse the productivity variation and input use efficiency in coconut based homesteads of Kerala found that a positive influence of the farm area on mean farm income. The increase in farm income in large sized holdings is due to the adoption of large number of coconut trees in those farms. They also found that the farmers grow mostly traditional crops including perennial and annuals without identifying the optimum mix and generally follow their own cultivation practices.

## 2.8 PROFILE CHARACTERISTICS OF COCONUT BASED HOMESTEAD FARMERS

### 1. Age

Gangadharan (1993) reported that regarding the adoption of improved agricultural practices in pepper, majority of the respondents belonged to the medium category.

Singha (1996) studied the socio-economic characteristics of coconut growers in a progressive area of Assam and revealed that majority of the farmers (66.67 per cent) were middle aged between 30-50 years.

Manjusha (1999) reported that there is a non-significant relationship between age and extent of adoption of recommended practices by farmers.

Manjusha (1999) reported that there is no significant relationship between age and extent of adoption of recommended practices by the farmers.

Sakthivel (2000) reported that 44.17 per cent of cassava cultivators fell under middle age group.

Thomas (2000) reported that age had positive and significant relationship with knowledge of farmers.

Priya (2003) reported that 80 per cent of the respondents were in the age group of 33-52 years and 15 per cent below 33 years.

Jaganathan (2004) observed that majority of the vegetable growers (48 per cent) belonged to old age category.

Mahindra and Kaur (2004) reported that 56.67 per cent respondents were in the age group of 28-36 years, 25.83 per cent 19-27 years and 17.50 per cent were between 37-45 years.

Thamban *et al.* (2006) reported that distribution of coconut farmers according to their age, majority (80 per cent) of the farmers are old i.e., above 45 years.

## **2. Experience in cultivation**

Sherief (1998) reported that extent of adoption of the homestead farmers showed positive and significant relationship with farming experience.

Manjusha (1999) reported that positive and significant relationship between experience in cultivation and extent of adoption of recommended practices.

Thomas (2000) reported that most of the farmers were having very low experience in medicinal plant cultivation and farming experience had positive and significant relationship with knowledge of farmers.

Fayas (2003) reported that about 75 per cent of the farmers have more than 20 years of experience in cultivation among the respondents.

Sasankan (2004) reported that 53 per cent of the respondents who had an experience in cassava cultivation were found to have more than 25 years.

Jaganathan (2004) observed that 47 per cent of the respondents were having medium level of experience in vegetable cultivation.

### **3. Education**

Gangadharan (1993) reported that educational status had positive and significant relationship with attitude of pepper growers towards improved agricultural practices.

Singha (1996) observed that two third of the farmers in the progressive area of Assam, were having (71.66 per cent) high educational level.

Sriram and Palanisamy (1997) found that educational status was positively and significantly related with the awareness of the ecofriendly farming practices of homestead farmers.

Sherief (1998) reported that knowledge of homestead respondents was positively and significantly related to educational status.

Sakthivel (2000) revealed that little more than one fourth of the respondents (26.7 %) had education upto secondary level, followed by middle education

(18.33 %) and primary education (16.67 %), only 8.33 per cent were educated upto collegiate. Among those who had no formal education, 25 per cent were illiterates and 5 per cent were functionally illiterates.

Beena (2002) reported that nearly half of the respondents (45 per cent) had education upto high school level and 19.16 per cent studied upto primary level. Only 1.67 per cent of respondent under the study were illiterate.

Nath (2002) reported that 48 per cent of the respondents had education upto secondary level and there were no illiterates.

Jaganathan (2004) reported that education status of the farmers had positive and significant relationship about knowledge and adoption of organic farming practices and majority of the respondents (52%) had secondary level education.

Sasankan (2004) reported that nearly half of the respondents (49 per cent) had education upto secondary level. There were negligible per cent (< 2 per cent) of illiterate farmers.

#### **4. Livestock possession**

Helen (1990) reported that majority of the small farm families possessed medium level of livestock possession.

Natarajan (1991) stated that majority of the farmers had low level of livestock possession.

Karthikeyan (1994) reported that a higher percentage of respondents had livestock possession worth Rs. 5001 to 10,000.

Sriram (1997) revealed that one third of the farmers owned livestock worth Rs. 5001 to 10,000.

Sherief (1998) reported that majority of the homestead farmers had low level of livestock possession.

Jaganathan (2004) revealed that nearly three fourth of the respondents had medium level of livestock possession.

## **5. Trainings attended**

Lakshmi (2000) revealed that more than half of the respondents did not attended any training programme.

Meera (2001) reported that majority of the respondents (86.6 %) had low level training.

Parthasarathi and Santha (2002) reported that the knowledge level of trained farmers was much higher on biological and physical methods of pest control, identification of pests and predators and on economic threshold levels.

Priya (2003) stated that nearly 95 per cent of farmers were in the high category in the case of training.

Jaganathan (2004) reported that 57 per cent of the respondents had medium level of training followed by low level 33 per cent and also reported that knowledge of vegetable growers about organic farming practices had significant and positive relationship with training attended.

## **6. Risk orientation**

Jaleel (1992) reported that risk orientation had positive and significant relationship with the extent of adoption among tribal farmers.

Gangadharan (1993) reported that there was positive and significant relationship between risk orientation and attitude of pepper growers towards improved agricultural practices.

Preetha (1997) reported that there was positive and significant relationship between risk orientation and knowledge among respondents.

Majjusha (2000) reported that extent of the knowledge of respondents had positive and significant relationship with risk orientation.

Fayas (2003) opined that risk orientation had positive and significant relationship with technology adoption.

Suthan (2003) reported that 58.67 per cent of the farmers had medium level of risk orientation.

Jaganathan (2004) observed that nearly three fourth of the respondents (73 %) had medium level of risk orientation and also knowledge of the farmers about organic farming practices had positive and significant relationship with risk orientation.

## **7. Self confidence**

Varma (1996) reported that self confidence had a positive and significant relationship with attitude.

Parvathy (2000) found that self confidence had a positive and significant relationship with attitude.

Meera (2001) observed that maximum (75.8 %) number of respondents were in the high category with respect to self confidence.

Suthan (2003) reported that 57.33 per cent of the farmers had high self confidence.



Jaganathan (2004) observed that most of the vegetable growers (63 %) belonged to medium category with respect to self confidence and self confidence had significant and positive relationship with awareness, adoption of organic farming practices among respondents.

Sasankan (2004) reported that 61 per cent had medium level of self confidence among respondents.

## **8. Innovativeness**

Gangadharan (1993) reported that respondents extent of awareness had positive and significant relationship with innovativeness.

Sudhakar (1998) found that respondents extent of adoption had positive and significant relationship with innovativeness.

Parvathy (2000) reported that innovativeness had positive and significant relationship with respondents attitude.

Venkatesan (2000) found that there was positive and significant relationship between respondent's extent of knowledge and innovativeness.

Beena (2002) reported that low level of innovativeness was expressed only by 35.83 per cent of the farmers and the majority of the respondents (64.17 %) constituted high group.

Jaganathan (2004) observed that more than half of the respondents (55 %) had medium innovativeness and also found that innovativeness had a positive and significant relationship with respondents extent of awareness, extent of knowledge and attitude.

Sasankan (2004) reported that 49 per cent of the farmers had medium level of innovativeness.

## **9. Market perception**

Nizamudeen (1996) reported that non significant relationship between market perception and extent of adoption of recommended practices of kutti mulla growers.

Syamkumar (1999) observed that respondents extent of awareness had positive and significant relationship with market perception.

Suthan (2003) reported that 54.67 per cent of the farmers had medium market perception.

Jaganathan (2004) found that 55 per cent of the respondents had medium level of market perception and respondents awareness and attitude towards the organic farming practices had a positive and significant relationship with market perception.

## **10. Environmental orientation**

Nair (1994) emphasized in his essay on “environment an development” that we are in need for a system which endeavors to create a way of thinking, requiring people to overcome prejudice and to develop an open way of looking at things around them. Thus the individuals and the community would gain awareness of the environment and require the needed skills to solve the problems.

Sreevalsan (1995) reported that nearly two third of the farmers were less environmentally oriented.

Jaganathan (2004) reported that nearly three fourth of the respondents (72 %) had high environmental orientation and observed that there was positive and significant relationship between environmental orientation and attitude towards organic farming and also reported that environmental orientation had positive and significant relationship with adoption of organic farming practices.

## 11. Information seeking behaviour

Gangadharan (1993) reported that there was a positive and significant relationship between knowledge of the farmers and information seeking behaviour.

Manju (1996) reported that there was no relationship between information seeking behaviour and knowledge of the farmers.

Manju (1996) observed that non significant relation between knowledge of the farmers and information seeking behaviour.

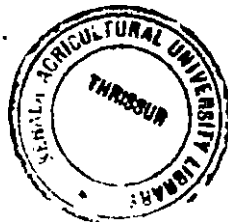
Preetha (1997) observed that information seeking behaviour had a significant and positive relationship with knowledge of farmers.

Preetha (1997) reported that the information seeking behaviour had a positive and significant relationship with knowledge of the respondents.

Venkatakumar (1999) observed that 45 per cent of the commercial coconut growers had medium level of information seeking behaviour whereas little more than one fifth of them had (22.12 %) low level of information seeking behaviour. Nearly one third (34.51 %) of the respondents had high level of information seeking behaviour.

Beena (2002) revealed that information seeking behaviour was found to be medium for the vast majority (88.33 %) of the respondents. Only 11.67 per cent of the respondents belonged to low group.

It is very clear from the above studies that the profile characteristics of respondents varied with situation. But it is a fact that these characteristics influence the innovation, programme or any development activity. Hence in this case also an attempt was made to study the profile characteristics of coconut based homestead growers.



## 2.9 EXTENT OF AWARENESS ABOUT ORGANIC FARMING PRACTICES

According to Dictionary of behavioural sciences awareness means being conscious of something perceiving and taking account of some event, occasion, experience or object.

Lionberger (1960) defined awareness as the first knowledge about an idea, product or practice. At the awareness stage a person has only general information about it.

Santha *et al.* (1993) observed that 10.73 per cent of the coconut farmers were not aware of the recommendation and 8.71 per cent were not convinced about the benefits of applying organic manures for coconut. Jaganathan (2004) reported that majority of the respondents (73%) had medium level of awareness followed by (17%) high levels. The above studies revealed the importance of awareness of the farmers about different farming practices. Awareness about programme or practice is important for its acceptance. So awareness of coconut based homestead farmers about organic farming was studied.

Sriram (1997) found that farmers were aware of eco-friendly practices like summer ploughing, trap cropping, crop rotation, mechanical control of pests, ash and cow dung slurry for disease control and collection and destruction of affected plant parts. They also found that educational status, extension agency contact, and risk orientation were positively and significantly related to the awareness of eco-friendly practices of farmers. A negative and significant relationship existed between age and farming experience with awareness of farmers on eco-friendly technologies.

Kavitha (1998) reported that 75 per cent of the farmers were aware about pungam, thumbai and adathoda leaves as green manure and 75 per cent of the farmers were aware about the use of pungam oil against pest.

Table 1. Relationship between the independent variables and respondents extent of awareness

Author	Year	Age	Education	Livestock possession	Training attended	Risk orientation	Self confidence	Innovativeness	Market perception	Environmental orientation
Nelson	1992							PS		
Santha	1992	NS	NS							
Gangadharan	1993	NES	PS			PS		PS		
Sriram	1997	NES	PS	NS		PS		NS		
Syamkumar	1999	PS	PS			PS	PS			
Jaganathan	2004	PS			PS		PS	PS	PS	PS

PS - Positively significant

NES - Negatively significant

NS - Non significant

Theodore (1988) found that some proportion of contact farmers (45%) belonged to the high awareness category with respect to the awareness about technological units of contingency farming practices. Nearly equal number of contact farmers (40%) and other farmers (42.5%) were in the low awareness category.

Krishnamurthy *et al.* (1999) reported that 65 per cent of the respondents were aware of the application of chemical fertilizers while 61.66 per cent were aware of plant protection measures.

Thyagarajan *et al.* (2001) pointed out that most of the rice farmers had medium level of awareness about the recommended biofertilizer practices.

Santhosh and Narwade (2001) opined that through improved varieties are adopted by the farmers with other component like integrated nutrient management are not given due consideration due to lack of awareness and confidence.

Kella and Iqbal (2002) reported that 65 per cent of respondents had high awareness about indigenous farm practices.

Jaganathan (2004) reported that organic farming practices like summer ploughing, *in situ* incorporation of crop residues, raising green manure crops and incorporation, selection of good seeds, application of FYM, application of poultry manure, timely irrigation, crop rotation, intercropping systems, mulching, hand/mechanical weeding, destruction of pests, (egg, larvae and pupae) and disease affected plants were well aware to the 80 to 95 per cent of farmers.

## 2.10 EXTENT OF KNOWLEDGE ABOUT ORGANIC FARMING PRACTICES

English and English (1958) defined knowledge as the body of understood information possessed by an individual by a culture.

Rogers and Shoemaker (1971) opined that knowledge of innovations could create motivation for their adoption.

Janadevan and Prakash (1992) reported that knowledge of coconut farmers about fertilizers, information sources used and extension contact were positively and significantly correlated to adoption.

Manoj (2000) reported that education, annual income, social participation, innovativeness, exposure to information, economic motivation, risk preference were found to have positive relationship with knowledge.

Sharma (2000) reported that knowledge of plant protection measures had positive and significant relationship with their adoption.

Thomas (2000) reported that farming experience, experience in medicinal plant cultivation, farm size, area under medicinal plant cultivation, annual income, extension contact, mass media exposure and information source utilization were having significant and positive relationship with knowledge on medicinal value.

Manoj (2000) reported that majority of the rice farmers (54.29%) were in the low group regarding knowledge about the recommended practices.

Jaganathan (2004) reported that 70 per cent of the vegetable growers had medium level of knowledge followed by high (18 %) and low (12) levels of knowledge about organic farming practices and also reported that knowledge of farmers about organic farming practices had positive and significant relationship with education, training attended, innovativeness, risk orientation, self confidence, environmental orientation and awareness.

Singh (2004) reported that around 29.2 per cent of farmers were found having more knowledge about zero tillage while 41.6 per cent were having knowledge of medium only 29 per cent of the farmers have less knowledge about zero tillage.

Table 2. Relationship between the independent variables and respondents extent of knowledge

Author	Year	Age	Education	Experience in cultivation	Training attended	Risk orientation	Self confidence	Innovativeness	Environmental orientation	Information seeking behaviour
Gangadharan	1993	NES	PS			PS		PS		PS
Manju	1996	NS	PS	NS		NS		NS		PS
Preetha	1997	NS	NES	PS		PS		NS		PS
Manjusha	1999	NS	PS	NS		NS		NS		
Majjusha	2000	NES	PS	NES		PS		NS		
Manoj	2000	NS	PW	NS		PS		PS		
Thomas	2000	PS	NS	PS						
Venkatesan	2000	NS	NS	PS				PS		
Jaganathan	2004		PS		PS	PS	PS	PS	PS	
Balasubramanian <i>et al.</i>	2005			PS						PS

PS - Positively significant

NES - Negatively significant

NS - Non significant



Balasubramanian *et al.* (2005) observed that area under coconut cultivation, experience in coconut cultivation, and information seeking behaviour were positively significant with knowledge gain.

The above studies showed that the knowledge level of farmers about an information or technology varied under different situations. It is a fact that proper knowledge about an information or technology is an indication for its effective transfer. Hence in this study also an attempt was made to assess the knowledge of coconut based homestead growers about organic farming practices.

## 2.11 ATTITUDE TOWARDS ORGANIC FARMING PRACTICES

Allport (1935) defined attitude as a mental and neural state of readiness organized through experience exerting a directive or dynamic influence upon the individuals, response to all objects and situations with which it is related.

Thurstone (1946) defined attitude as the degree of positive or negative effect associated with some psychological object towards which people can differ in varying degrees.

Sivaramakrishnan (1981) reported that attitude towards improved coconut varieties were found in least value among coconut growers.

Kuppuswamy (1984) stated that attitudes are learned in the course of life experience which make the individual behave in characteristic ways towards persons, objects or issues to which they get related.

Janadevan (1993) reported that there was positive and significant relationship between farming experience, scientific orientation, and economic motivation with level of attitude of beneficiary farmers towards coconut development programmes.

Table 3. Relationship between independent variables and respondents extent of attitude

Author	Year	Age	Education	Experience in cultivation	Risk orientation	Self confidence	Innovativeness	Market perception	Environmental orientation
Natarajan	1991	NES	PS				PS		
Gangadharan	1993	NES	PS		PS		PS		
Varma	1996	NES	PS		PS		PS		
Sriram	1997	NES	PS	NS	PS		PS		
Rajendralal	1997	NS	PS		PS	PS			
Syamkumar	1999	NS	PS	NES	NS		NS		
Parvathy	2000	NS	NS			PS	PS		
Jaganathan	2004					PS	PS	PS	PS
Janadevan	1993			PS					
Nath	2002		PS				PS		

PS - Positively significant

NES - Negatively significant

NS - Non significant

Gangadharan (1993) reported that educational status, scientific orientation, information source used, innovativeness, contact with extension agency and market orientation had significant and positive relationship with attitude of pepper growers towards improved agricultural practices.

Nath (2002) reported that education, exposure to mass media, innovativeness and economic motivation had positive and significant relationship with attitude.

Suthan (2003) reported that 60 per cent of the farmers had low attitude towards scientific agricultural practices.

Jaganathan (2004) reported that majority of the vegetable growers (64 %) had a favourable attitude towards organic farming practices followed by less favourable (22 %) and most favourable (14 %) attitude and also reported that mass media exposure, innovativeness, market perception, self confidence, environmental orientation, awareness and knowledge showed a positive and significant relationship with attitude towards organic farming.

The view of the above studies revealed that the attitude of farmers towards an object, practice, programme etc. varied with situation. It can be concluded that favourable attitude towards a development activity, practice or innovation is a prime requirement for its increased participation and success. So in this study also attitude towards organic farming was considered to be an important variable.

## 2.12 EXTENT OF ADOPTION OF ORGANIC FARMING PRACTICES

Wilkening (1952) postulated the adoption of innovation as a process composed of learning, deciding and acting over a period of time. The adoption or a decision to act has a series of actions and thought decisions.

Table 4. Relationship between independent variables and respondents extent of adoption

Author	Year	Age	Education	Experience in cultivation	Training attended	Risk orientation	Self confidence	Innovativeness	Environmental orientation
Manju	1996	NS	NS	NS		NS		NS	
Sriram	1997	NES	PS	NS		PS		PS	
Preetha	1997	NS	NS	NS		PS		NS	
Sudhakar	1998		PS	NS		PS		NS	
Manjusha	1999	NS	NS	NS		NS		NS	
Majjusha	2000	NS	PS	NS		NS		NS	
Manoj	2000	NS	NS	PS		NS		PS	
Venkatesan	2000	NS	NS	NS		PS			
Jaganathan	2004		PS		PS		PS	PS	PS
Fayas	2003					PS		PS	

PS - Positively significant

NES - Negatively significant

NS - Non significant

Rogers and Shoemaker (1971) defined adoption as decision to make use of the innovation. They considered adoption as a decision to continue full use of an innovation as the best course of action.

Janadevan and Prakash (1992) reported that knowledge of coconut farmers about fertilizers, information sources used and extension contact were positively and significantly correlated to adoption.

Santha *et al.* (1993) observed that the adoption of green manure and cover crops in coconut gardens, only 6.22 per cent of the farmers adopted this practice. The extent of non adoption was 93.8 per cent. Among the different size groups adoption was more in more than 1.2 hectare holding size. And also 64.36 per cent were not adopting husk burial.

Kavitha (1998) concluded that majority of the respondents (67.50%) had medium level of adoption of neem technologies followed by 16.67 per cent and 15.83 per cent farmers who had high levels of adoption.

Prasad *et al.* (1999) stated that marginal farmers exhibited low level of adoption of plant protection measures compared to small and big farmers.

Naidu and Venkataramaiah (2001) reported that farm size and annual income were found to be significant and positively related with adoption. It is observed that large farm size is a favourable factor for the adoption of new innovations.

Kella and Iqubal (2002) observed that 20.83 per cent of the respondents had high level adoption of indigenous farm practices.

Fayas (2003) reported that around 67 per cent of the farmers belonged to the medium category group for technology adoption and farmers were interested in organic pest management. Annual income, innovativeness and

risk orientation showed most significant and positive correlation with technology adoption.

Jaganathan (2004) observed that majority of the respondents (64%) had medium level of adoption followed by low (19%) and high (17%) levels of adoption and the extent of adoption of organic farming practices was greatly influenced by knowledge, environmental orientation and awareness of vegetable growers. And also reported that education, mass media exposure, training attended, innovativeness, self confidence, environmental orientation awareness, knowledge and attitude showed a significant and positive relationship adoption of organic farming practices.

Kavasakar and Govind (2005) reported that the mean adoption score of the respondents on organic manures and fertilizers, micronutrients and biofertilizers was found to be very low with 32.49, 7.08 and 5.0 per cent respectively.

In the light of the above explanations and findings it could be deduced that adoption level of farmers varied with situation. High adoption is the ultimate goal of any innovation. Hence in this study also adoption of organic farming practices by coconut based homestead growers was studied.

### 2.13 CONSTRAINTS FACED BY THE COCONUT FARMERS IN ADOPTING ORGANIC FARMING PRACTICES

Muliyar (1989) attributed the following reasons for the low productivity of coconut in Kerala. Traditional methods of cultivation, lack of manuring practices, moisture stress and lack of irrigation facilities, poor water management, soil health problems, senility of the palms, absence of systematic replanting programmes, non-availability of quality planting materials, non-availability of high yielding hybrid varieties, prevalence of serious disease problems such as root

wilt, problems of certain pests, socio-economic constraints such as, poor economic status of the grower, lack of credit, inputs in time, fluctuating markets and infrastructural facilities.

Chandrabindu *et al.* (1995) found the following constraints experienced by farmers who were having agriculture – livestock component in their homestead farming. Physical constraints like lack of scientific management, use of local implements, lack of irrigation facilities and difficulty to do intercultural operations which were mainly experienced due to inappropriateness of recommended technology. The economic constraints like lack of money, high cost of organic and inorganic fertilizers and debt. The managerial constraints like inadequate veterinary service and incidence of endemic and epidemic disease to the livestock which could not be managed by the farmers.

Jayasankar (1988) reported that the constraints faced by the coconut farmers were poor performance of the crop, low productivity of palms, inferior genetic base, poor management, incidence of pest and diseases, lack of proper product diversification and marketing.

Prakash (1989) reported that the poor performance of coconut crop in the state is due to lack of irrigation facilities, severe incidence of disease like root wilt, high palm density and senility of the existing palms.

Sherief (1998) reported that lack of information, low yield, high cost of organic inputs, high labour cost, problem of pest and diseases, skill labour requirement, lack of credit facilities lack of Government support, low premium for organic product, and lack of extension support were found to be the major constraints faced by the homestead respondents in the adoption of resource sustaining agricultural practices.

Janadevan (1993) reported that, higher labour cost, non availability of labour in time inadequate and untimely supply of coconut seedlings, non availability of climbers for carrying out plant protection operations, lack of financial assistance, were the major constraints faced by coconut growers.

Ranganathan *et al.* (2001) observed that more cost and risk involvement in getting organic manures (vermicompost, oil cakes etc.), transportation of green manures, lack of ready package for growing rice organically and biological control of pests and disease were the major constraints faced by 60 per cent of the small farmers.

Resmy *et al.* (2001) revealed that the farmers were not adopting sustainable practices in coconut and banana due to lack of knowledge, technical guidance and lack of information sources.

Balachandran (2004) reported that climate changes, erratic rains, unavailability of labour and high labour wage rate, pest and disease infestations, unavailability of good indigenous seeds, artificially created price slump in the harvest season forces small scale farmer to sell at under price. Lack of support during transition to organic farming and lack of market facilities, consumer awareness regarding organic produce were major constraints faced by the farmers in organic farming.

Borah *et al.* (2004) reported that lack of knowledge of scientific crop production, lack of suitable varieties, non availability of improved seeds, inability to purchase fertilizers and plant protection chemicals, lack of irrigation facilities. high cost of cultivation, non availability of credit facilities, low selling price were the constraints faced by respondents.

Jaganathan (2004) reported that important constraints experienced by vegetable growers were non availability inputs, lack of information, lack of



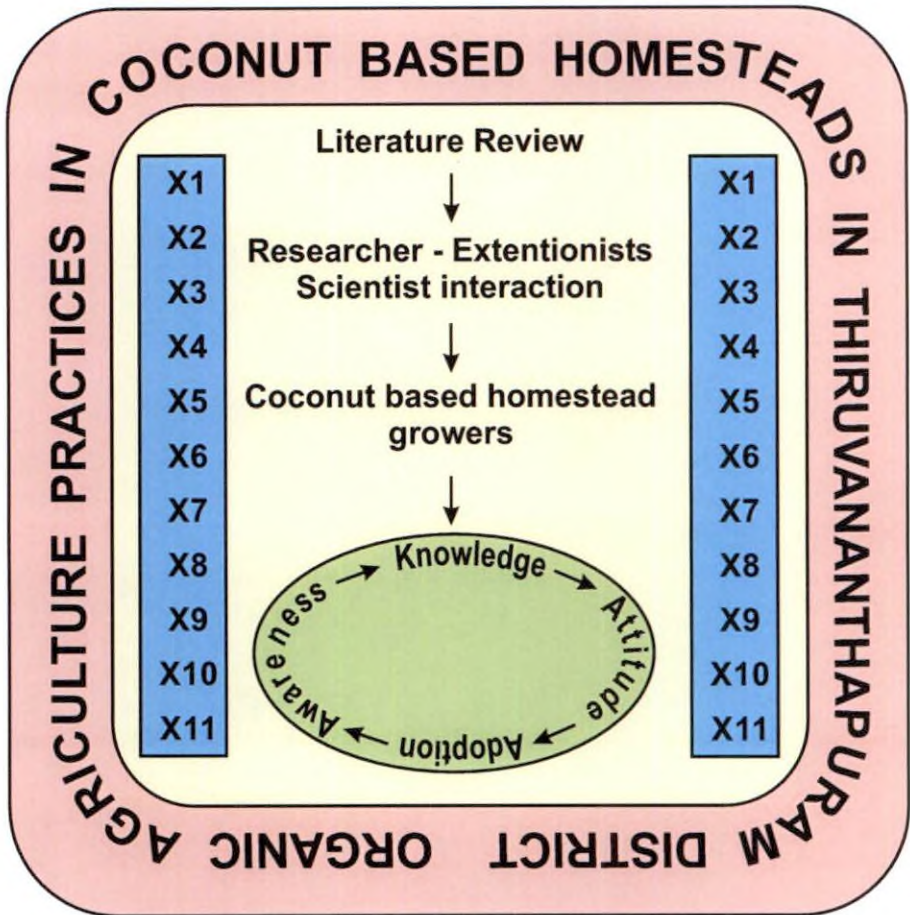
sufficient good quality seeds, high cost of inputs, extensive prevalence of pests and diseases, lack of credit facilities, lack of market facilities, lack of ready package, high labour charges, lack of awareness and knowledge about organic farming practices, inadequate extension support and low premium for organic vegetables from high cost cultivation, non availability of credit facilities, low selling price were the constraints faced by respondents.

Singh (2004) opined that the rainfall, drought, lack of knowledge on improved dry land practices, lack of finance and low price of produce as very severe constraints.

The above studies revealed that constraints in the adoption of different farming practices varied with crops, time, place etc. It is clear from the findings that problems like non availability of inputs, high cost of inputs, lack of knowledge, incidence of pest and diseases and lack of credit facilities were the constraints. Hence constraints in the adoption of organic farming were studied to know the importance.

## 2.14 CONCEPTUAL FRAMEWORK OF THE STUDY

A conceptual model of the study has been framed based on the objectives set forth for the study, the concepts theoretically derived from the review of literature and the factors influencing the awareness, knowledge, attitude and adoption of organic farming practices selected by discussion with experts. The framework explains the wide spectrum of profile characteristics of respondents (Independent variables) that influence the awareness, knowledge, attitude and adoption (Dependent variables) (Fig. 1).



- X1 - Age
- X2 - Experience in coconut cultivation
- X3 - Education
- X4 - Livestock possession
- X5 - Training attended
- X6 - Risk orientation

- X7 - Self confidence
- X8 - Innovativeness
- X9 - Market perception
- X10 - Environmental orientation
- X11 - Information seeking behaviour

Fig. 1. Conceptual framework of the study

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# METHODOLOGY

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### 3. METHODOLOGY

In accordance with the objectives of the study the research methodology adopted is presented under the following heads.

- 3.1 Research design
- 3.2 Locale of the study
- 3.3 Selection of respondents
- 3.4 Identification of organic farming practices in coconut based homesteads
- 3.5 Operationalisation and measurement of independent variables
- 3.6 Operationalisation and measurement of dependent variables
- 3.7 Constraints in the adoption of organic farming practices as perceived by the coconut based homesteads farmers
- 3.8 Methods used for data collection
- 3.9 Statistical tools used for analysis

#### 3.1 RESEARCH DESIGN

Research design is the entire process of planning and carrying out research. Kerlinger (1978) defined “Research design is the plan, structure and strategy of investigation so as to obtain answer to research questions and to control variance”. The plan is the overall scheme or programme of research. For this study ex-post facto design was used. This is systematic empirical enquiry in which the scientist does not have direct control over the variables because their manifestations have already occurred or because they are inherently not manipulatable. The

framework is expected to facilitate theoretical and empirical analysis of the awareness, knowledge, attitude and adoption of the respondents. It depicts the major objective of analyzing the organic farming practices in coconut based homesteads. It also explains the wide spectrum of profile characteristics of respondents (Independent variables) that influence the awareness, knowledge, attitude and adoption (dependent variables of organic farming practices (Fig. 1).

## 3.2 LOCALE OF THE STUDY

### 3.2.1 Selection of the district

Thiruvananthapuram district was selected purposively due to the following reasons.

- i) In Kerala State, out of the 14 districts, Thiruvananthapuram district is having the highest number of coconut based homesteads as given in Table 5.
- ii) More number of agencies were involved in the promotion of organic farming in this district.
- iii) There are several progressive farmers who follow organic farming practices including those who have won the 'Harithamitra' award for the best fruit-vegetable growers in the State.
- iv) The Vegetable and Fruit Promotion Council Keralam (VFPCCK) is conducting several Participatory Technology Development (PTD) experiments in this district.
- v) The Training Service Scheme under the College of Agriculture, Vellayani, is conducting several organic farming based training programmes specially for farmers in Thiruvananthapuram district.



**Fig. 2. Locale of the study**

Table 5. Number of coconut based homesteads in the districts of Kerala

Sl. No.	District	Number of Homesteads
1	Kasaragod	2,25,252
2	Kannur	4,57,368
3	Wayanad	1,66,763
4	Kozhikode	5,67,658
5	Malappuram	6,12,413
6	Palakkad	5,30,216
7	Thrissur	6,39,871
8	Ernakulam	6,93,161
9	Idduki	2,65,344
10	Kottayam	4,34,520
11	Alappuzha	4,83,960
12	Pathanamthitta	2,97,134
13	Kollam	5,93,314
14	Thiruvananthapuram	7,59,382

Source : Census of India 2001 Final population Totals (supplement)  
Directorate of Census operations, Kerala.

### 3.2.2 Selection of blocks and krishibhavans

Thiruvananthapuram district comprises of 12 Community Development (CD) blocks with 84 panchayat units. Each of the panchayat has a krishi bhavan (Agricultural Office) which functions as a nodal agency for agricultural development of that panchayat. From these 12 blocks, three blocks were selected randomly. The blocks selected were Nemom, Adiyanoor and Chirayinkeezh. From each block, one panchayat was selected. The selected panchayats were Kalliyoor, Kizhumilum and Venganoor. The sampling frame of the study is shown in Fig. 3 and the map showing the location of the study is presented as Fig. 2.

### 3.3 SELECTION OF THE RESPONDENTS

Multistage random sampling technique was followed for the selection procedure.

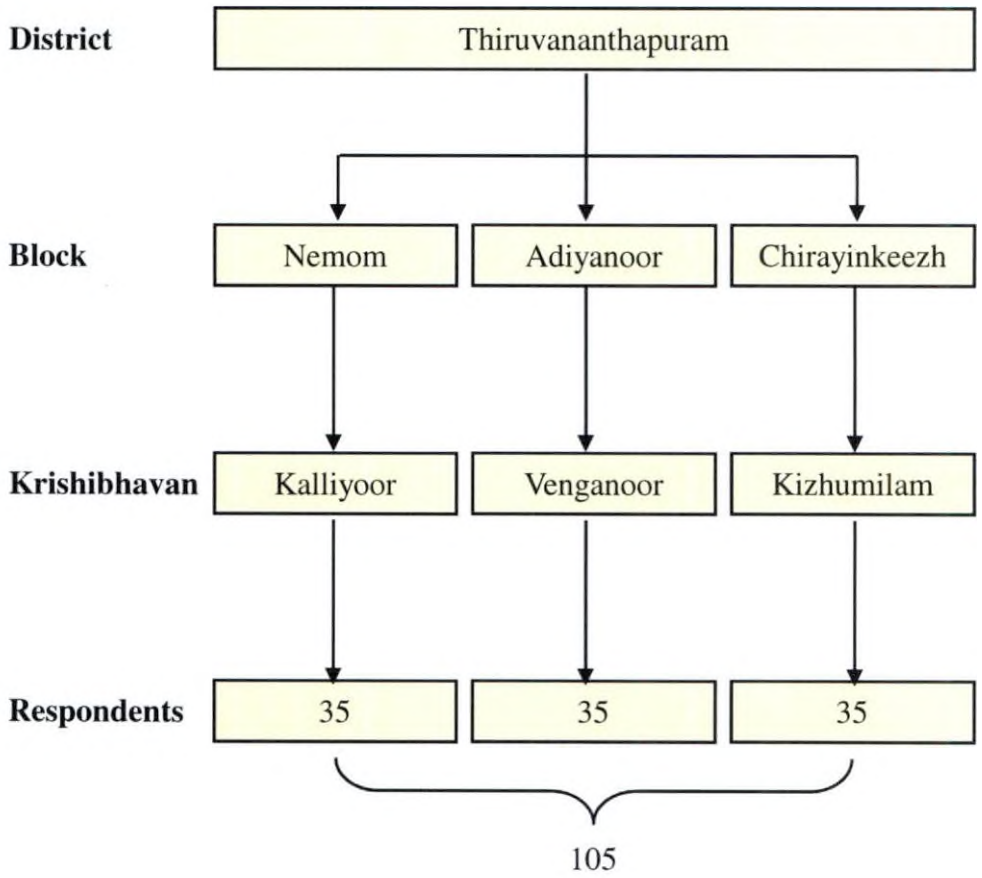


Fig. 3. List of Krishibhavan selected for the study



Stage I From the 12 blocks in the district, three blocks were selected randomly. They are Nemom, Adiyanoor and Chirayinkeezh.

Stage II From each of the three blocks selected, one panchayat viz., Kalliyoor from Nemom block, Venganoor from Adiyanoor block and Kizhumilam from Chirayinkeezh block were also selected at random.

Stage III List of farmers who practice organic farming in homesteads was collected from the concerned Krishibhavans. The farmers were selected by using random sampling technique. In each panchayat 35 farmers were selected. Thus 105 respondents were selected from the three Panchayats.

#### Panchayatwise distribution of respondents

Sl. No.	Block	Gramapanchayat	Number of respondents
1	Nemom	Kalliyoor	35
2	Adiyanoor	Venganoor	35
3	Chirayinkeezh	Kizhumilam	35
	Total		105

### 3.4. IDENTIFICATION OF ORGANIC FARMING PRACTICES IN COCONUT BASED HOMESTEADS

As there was no standardized package for organic farming practices, an explorative methodology was employed to identify the organic farming practices in coconut based homestead cultivation.

The selection of organic farming practices was done in two stages. In the first stage, 30 organic farming practices were identified based on review of literature and in consultation with experts of various fields of agriculture. In the second stage, 40 scientists representing different disciplines in agriculture comprising Agronomy, Soil Science, Agricultural Extension and other related

fields were requested to serve as judges to indicate the degree of relevance of these organic farming practices in coconut cultivation on three point continuum of most relevant, relevant and least relevant.

The degree of relevance was quantified by assigning a score of 3 for the response 'most relevant', 2 for the response 'relevant' and 1 for the response 'least relevant'. The total score of all judges for each organic farming practice was arrived at and the mean values was also worked out. The organic farming practices which were having a mean value more than the overall mean value were selected. The mean values of twenty organic farming practices were found to be more than the overall mean and they were selected for the study (Appendix II).

The mean values of organic farming practices were used as weightage for calculating the adoption index of the coconut growers.

### 3.5 OPERATIONALISATION AND MEASUREMENT OF INDEPENDENT VARIABLES

Based on the objectives, review of literature, discussion with experts and observation made by the researcher, a list of personal and socio-psychological characteristics were identified along with their operational definitions and sent to 40 judges for eliciting their relevancy on a three point continuum ranging from most relevant to least relevant (Appendix I).

The scores were assigned as follows :

Response	Score
Most relevant	3
Relevant	2
Least relevant	1

The total score obtained for each variable was worked out. The variables having a score value of 75 per cent and above were selected. Thus the personal and socio-psychological variables selected were :

1. Age
2. Experience in coconut cultivation
3. Education
4. Livestock possession
5. Training attended
6. Risk orientation
7. Self confidence
8. Innovativeness
9. Market perception
10. Environmental orientation
11. Information seeking behaviour

### 3.5.1 Age

This was operationally defined as the number of years the respondent has actually completed at the time of interview. The respondents were classified into three categories namely, young, middle and old as followed by Sherief (1998).

Category	Age
Young	$\leq 34$ years
Middle	35 - 44 years
Old	$\geq 45$ years

### 3.5.2 Education

Education was operationalised as the extent of formal education acquired by the respondent. It was measured by assigning scores for different levels of education. The categorization of the respondents and the corresponding scores are given below as followed by Majjusha (2000).

Level of education	Score
Illiterate	0
Primary school	1
Secondary school	2
Collegiate	3

### 3.5.3 Experience in coconut cultivation

Experience in coconut cultivation was defined as the total number of years the respondent has been engaged in coconut cultivation. The scoring procedure adopted by Sreedaya (2000) was used. The scoring pattern is given below

Sl. No.	Experience	Score
1	Upto 5 years	1
2	6-10 years	2
3	11-25 years	3
4	Above 25 years	4

### 3.5.4 Livestock possession

Livestock possession referred to the number of animals possessed by an individual. The value of various livestock items was calculated and the total value of all the livestock was calculated, the total value of all the livestock was categorized into the following intervals as given by Sriram (1997).

Sl. No.	Value (Rs.)	Score
1	≤ 5000	1
2	5001 – 10000	2
3	10,001 – 15,000	3
4	15,001 – 20,000	4
5	20,001 and above	5

### 3.5.5 Training attended

Training attended was defined as the number of trainings in various organic agricultural activities undergone by the respondent during the last three years. The scoring procedure followed by Meera (2001) was used with slight modification.

Sl. No.	Training undergone	Score
1	No training	0
2	One training	1
3	Two training	2
4	Three or more training	3

### 3.5.6 Risk orientation

Risk orientation was operationalised as the degree to which the farmer is oriented towards encountering risks and uncertainty in adopting organic agricultural practices and has courage to face problems of risk. The scale followed by Majjusha (2000) was used to measure risk orientation with slight modification. The scale consisted of six statements of which two statements were negative. The respondents were rated on a five point continuum with scores 4, 3, 2, 1 and 0 for their responses strongly agree, agree, undecided, disagree, strongly disagree respectively. For the negative statements the scoring procedure was reversed. The scores obtained on each statement were cumulated to obtain the

total score. Thus the maximum that could be obtained by a respondent was 24 and the minimum zero.

### 3.5.7 Self confidence

Self confidence was operationally defined as the extent of feeling about one's own powers, abilities and resourcefulness to perform any activity which the farmer desires to undertake. Self confidence was measured using the scale followed by Nath (2002). The scale consisted of eight statements. The respondents were asked to state their response on a five point continuum ranging from always, most often, often, occasionally and never with the scores of 4, 3, 2, 1 and 0 respectively for the positive statements. The scoring procedure was reversed in the case of negative statements. Total score was obtained by summing up of all the scores for each statement. The score range was between 32 and 0.

### 3.5.8 Innovativeness

Innovativeness was defined as the degree to which the respondent was relatively earlier in adopting new ideas.

The scoring procedure followed by Priya (2003) was used to measure innovativeness with slight modifications. In this procedure question was asked as to when the farmer would like to adopt an organic agriculture practice. The response was scored as follows.

Sl. No.	Response	Score
1	As soon as it is brought to my knowledge	3
2	After I had seen other farmers tried successfully in their farms	2
3	I prefer to wait and take my own time	1
4	I am not interested in adopting organic farming practices	0

### 3.5.9 Market perception

Market perception was defined as the capacity of the respondent to identify the market trend to sell the produce for greater returns.

The scale followed by Fayas (2003) was used to measure market perception with slight modification. The method consisted of scoring the responses obtained to selective questions presented to the respondents to elicit their perception of market for the produce. The questions and the scoring procedure adopted were as follows.

1. Do you think that a farmer will be able to sell coconuts at a higher demand if he increases the quality by adopting organic agricultural practices

No - 0

Yes - 1

2. How much price the coconut cultivated following organic agricultural practices will fetch compared to those raised under conventional methods

Low price - 0

Same price - 1

High price - 2

3. How difficult it will be to dispose coconut cultivated following organic agricultural practices

Very difficult - 0

Difficult - 1

Easy - 2

Very easy - 3

The total score range was between 0 and 6

### 3.5.10 Environmental orientation

Environmental orientation was operationalised as the degree to which a farmer was concerned about his environment.

The scale developed by Sreevalsan (1995) was used in this study. The scale consisted of six statements and the respondents were asked to state their agreements or disagreements to each of the statements and scores of one and zero were assigned for agree and disagree respectively. The responses were summed up to obtain the environmental orientation score. The score range was between six and zero.

### 3.5.11 Information seeking behaviour

Information seeking behaviour measures the extent to which the respondent is seeking information from different communication sources.

Gaikawad (1957) has developed the scale for measuring this variable. In the present study the scale made by Sindhu (1997) was utilized with slight modification. Scale was rated over a three point continuum ranging from "always", "sometimes" and "never". The score ranges from 0 to 24. The following procedure was adopted for the study.

Sl. No.	Source	Always (2)	Sometimes (1)	Never (0)
1.	Director/Principal Agricultural Officer			
2.	Agricultural Officer			
3.	Agricultural Assistant			
4.	Agricultural Scientist			
5.	Fertilizer agent			
6.	Relatives			
7.	Newspaper			
8.	Radio			
9.	Television			
10.	Agricultural publications			
11.	Fellow growers			
12.	Others, specify			



### 3.6 OPERATIONALISATION AND MEASUREMENT OF DEPENDENT VARIABLES

#### 3.6.1 Extent of awareness about organic agricultural practices

Awareness was operationalised as the extent to which respondents were familiar with the organic farming practices in coconut cultivation. Gangadharan (1993), Sriram (1997) and Sherief (1998) measured awareness on a two point continuum namely “aware” and “not aware”. In this study, the respondents were asked to indicate the degree of awareness about twenty organic agriculture practices on a two point continuum aware and not aware and scores of 1 and 0 respectively. The awareness scores for all the organic agricultural practices were summed up to arrive at the overall awareness score of the respondent. Awareness index was calculated using the following formula.

$$\text{Awareness Index} = \frac{\text{Respondent's actual score}}{\text{Maximum possible score}} \times 100$$

Awareness was also used as an independent variable for testing its relationship with knowledge, attitude and adoption.

#### 3.6.2 Extent of knowledge about organic agriculture practices

In the present study knowledge refers to the extent of information possessed by the respondent about organic agriculture practices in coconut cultivation.

Nachiappan and Srinivasamurthy (1976) used the teacher made test to find out the knowledge levels of small farmers with respect to farm technology. They calculated knowledge index by the following formula

$$\text{Knowledge Index} = \frac{\text{Actual score obtained}}{\text{Maximum score allotted}} \times 100$$

Gangadharan (1993) measured knowledge of the respondents about improved agricultural practices in pepper cultivation based on teacher made test. Majjusha (2000) measured knowledge of respondents about farmer's practice in cowpea cultivation based on teacher made test. Jaganathan (2004) measured knowledge of organic farming practices in vegetable cultivation based on same test. Similarly, teacher made test was used in this study to measure knowledge about organic agricultural practices in coconut cultivation.

A set of 25 statements reflecting the knowledge of the respondents about organic agriculture practices were selected based on review of literature and discussion with experts in the Department of Agricultural Extension and other related fields. Thirteen statements were later discarded due to ambiguity and duplication. Finally Twelve statements were selected for the test. A score of "one" was assigned to the correct answer and "zero" to wrong answer. The sum of scores obtained for all items indicated the knowledge score of a respondent. Thus the maximum knowledge score that could be obtained by a respondent was 12 and the minimum zero. Based on the knowledge score, knowledge index was calculated using the following formula.

$$\text{Knowledge Index} = \frac{\text{Respondent's total score}}{\text{Maximum possible score}} \times 100$$

Knowledge was also used as an independent variable for testing its relationship with attitude and adoption.

### **3.6.3 Attitude towards organic agriculture practices**

The term attitude refers to the degree of positive or negative effect towards a psychological object. The focus of the study is on organic farming practices, the scale developed by the Jaganathan (2004) to measure the attitude towards organic farming practices among farmers was used for this study with slight

modifications. The scale consisted eight statements. Each statement was noted on a five point continuum as strongly agree, agree, undecided, disagree and strongly disagree with scores of 4, 3, 2, 1 and 0 respectively for positive statements. The scoring was reversed in the case of negative statements. The score was obtained for each item and summed up to get the attitude score of a farmer. The maximum score was 32 and the minimum was 0.

#### 3.6.4 Extent of adoption of organic farming practices

In this study adoption meant the degree to which a farmer had actually adopted an organic farming practice. The extent of adoption of organic farming practice in coconut cultivation was measured by means of an adoption index developed for the study. In this study, the procedure followed by Sriram (1997) was used to measure the extent of adoption of organic farming practices with slight modification. After perusal of relevant literature and based on the discussion with the scientists and the extension workers, 20 organic farming practices were identified in coconut cultivation. The practices were different in their contribution to yield and environment safety. So equal value for all practices was not meaningful. Hence a method was adopted for assigning weightage to the practices as explained in the chapter 3. The farmers' responses were divided into three categories namely adopted, partially adopted and not adopted. Scores of 2, 1 and 0 were assigned respectively to each item in accordance with the respective practice weightage. The total adoption index for each farmer was calculated using the following formula.

$$\text{Adoption Index} = \frac{\text{Respondent's total score}}{\text{Total possible score}} \times 100$$

Respondent's total score = Score obtained in each practice adopted by a farmer, multiplied by the respective practice weightage summed over all practices.

Total possible score = Total number of practices recommended multiplied by the respective practice weightage and summated

### 3.7 CONSTRAINTS IN THE ADOPTION OF ORGANIC FARMING PRACTICES AS PERCEIVED BY COCONUT GROWERS

Based on the review of relevant literature and discussions with the experts of both state Department of Agriculture and Kerala Agricultural University, the constraints faced by coconut growers were collected separately. The important constraints in the adoption of organic farming practices by the coconut growers were finally selected and these constraints were enlisted in the interview schedule.

The response to each constraints was obtained on a three point continuum namely most important, important and least important. In order to rank the constraints, a cumulative index was calculated. For this, weightages of 3, 2 and 1 were given to the responses, most important, important and least important respectively. The frequencies of responses under each category were multiplied with the corresponding weightage and added to get a cumulative index for the particular constraint. The ratio between cumulative index and the frequency of responses for each constraint was worked out. Based on the ratio the constraints were ranked in each case. The solutions of the most important constraints were also recorded.

### 3.8 METHOD USED FOR DATA COLLECTION

Taking into consideration of the scope and objectives of the study, a draft interview schedule was prepared after perusal of available literature and through consultation with experts in the field of extension education and other related

fields. After incorporating their suggestions, a well structured interview schedule was finalized in English and translated to Malayalam for collecting data from the farmers.

Interview schedule was field tested with coconut based homestead growers in a non-sample area by the researcher. The experiences gained by the researcher during the test were of great help in making the questions more clear, free from ambiguity and to use simple language. Necessary changes were incorporated in the interview schedule. The final version of the interview schedule is given in Appendix (III). The data were collected from 105 coconut based homesteads growers through personal interview by the researcher using the final interview schedule. Non-participant observation technique was also followed for data collection.

### 3.9 STATISTICAL TOOLS USED FOR ANALYSIS

The data collected from the respondents were scored, tabulated and analysed using suitable statistical methods. The statistical analysis was done using computer facilities available at the College of Agriculture, Vellayani. Keeping in view the objectives of the study and amenability, the data were subjected to different statistical tools. These tests included mean, standard deviation, percentage, coefficient of variation and critical difference which were used in comparison of different categories and frequencies. The other statistical tool like correlation coefficient were also used in analyzing the data. A brief description of the tools used is given below.

#### **Averages**

The mean scores for all the variables were worked out to make suitable comparisons wherever necessary. The median and quartiles ( $Q_1$ ,  $Q_2$  and  $Q_3$ ) were also used to study the range of variability.

**Percentage analysis**

Percentage analysis was done to make simple comparisons wherever necessary.

**Correlation analysis**

Correlation coefficient is a measure of the relationship between two variables. The correlation coefficient was worked out to measure the relationship between the dependent variables and the independent variables.

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## **RESULTS AND DISCUSSION**

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## **4. RESULTLS AND DISCUSSION**

The results of the study are presented and discussed in this chapter under the following sub-headings

- 4.1. Profile characteristics of the coconut based homestead farmers
- 4.2. Awareness of coconut based homestead farmers about organic farming practices
- 4.3. Knowledge of coconut based homestead farmers about organic farming practices
- 4.4. Attitude of coconut based homestead growers about organic farming practices
- 4.5. Adoption of organic farming practices by the coconut based homestead farmers
- 4.6. Application of inorganic and organic fertilizers among the coconut based homestead farmers
- 4.7. Relationship between the characteristics of coconut based homestead farmers with their extent of awareness, knowledge, attitude and adoption.
- 4.8 A comparative analysis of independent variables and dependent variables of coconut based homestead farmers.
- 4.9. Empirical model of the study
- 4.10 Model of variables influencing organic farming practices
- 4.11. Constraints in the adoption of organic farming practices and suggestions for overcoming them.



#### 4.1. PROFILE CHARACTERISTICS OF THE COCONUT BASED HOMESTEAD FARMERS

A clear understanding of the socio-economic and psychological characteristics of the respondents would enable the investigator to interpret the data. For this purpose eleven variables were selected and included in the study.

The profile characteristics of the respondents are presented in Fig. 4 and discussed below.

##### 4.1.1. Age

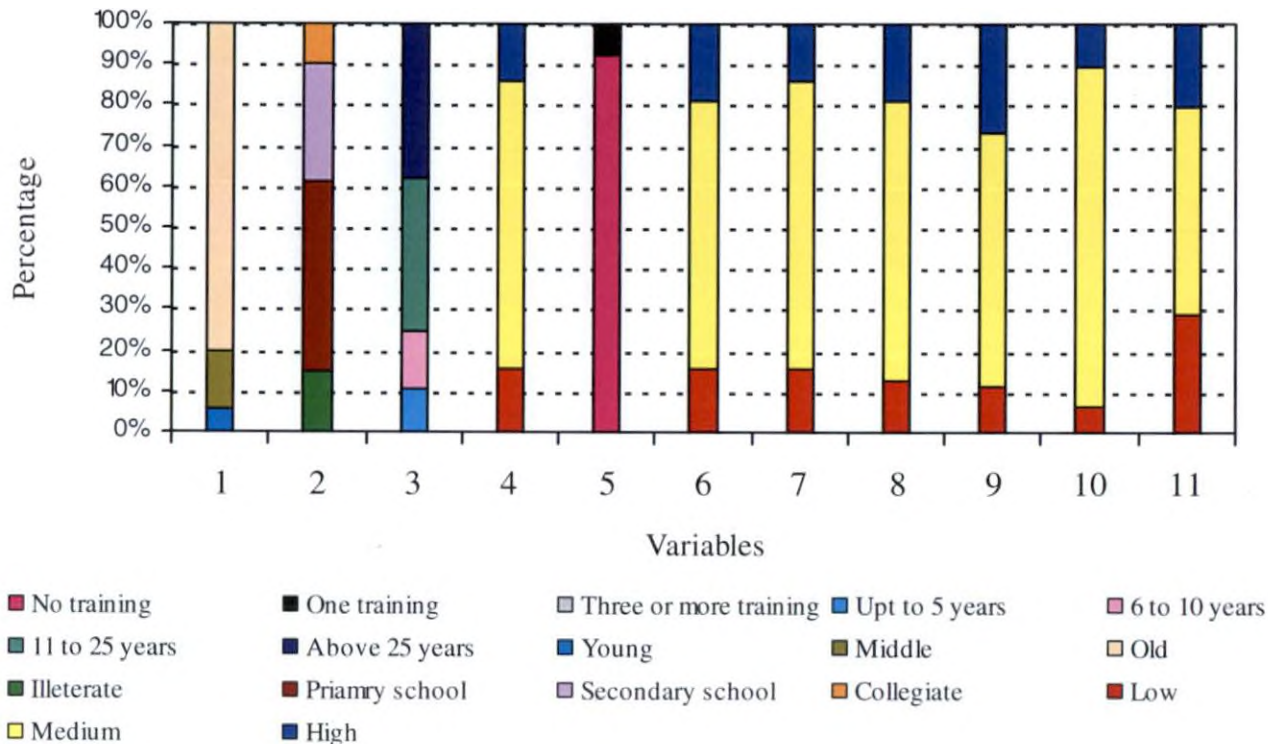
Table 6. Distribution of coconut based homestead farmers according to their age

(n = 105)

Sl. No.	Category	Frequency	Percentage
1.	Young age ( $\leq 34$ )	6	6
2.	Middle age (35 – 44)	15	14
3.	Old age ( $\geq 45$ )	84	80

From Table 6, it could be observed that majority of the coconut based homestead farmers (80%) were old aged while 14 per cent were found to be in the middle group. Six per cent of the respondents belonged to the young category.

Coconut was the major crop in homesteads and it is the primary source of income of the farmers in the study area. So it is natural to find old and middle aged farmers cultivating coconut. And also it reflects the situation in which younger generation is moving away from farming. A similar result was reported by Priya (2003), Jaganathan (2004) and Thamban *et al.* (2006).



1 – Age, 2 – Education, 3 – Experience in coconut cultivation, 4 – Livestock possession, 5 – Training attended, 6 – Risk orientation, 7 – Self confidence, 8 – Innovativeness, 9 – Market perception, 10 – Environmental orientation, 11 – Environmental orientation

Fig. 4. Profile characteristics of the coconut based homestead farmers

#### 4.1.2. Experience in coconut cultivation

Table 7. Percentage and frequency distribution of coconut based homestead farmers according to their experience in coconut cultivation

(n = 105)

Sl. No.	Category	Frequency	Percentage
1.	Upto 5 years	11	11
2.	6-10 years	15	14
3.	11-25 years	39	37
4.	Above 25 years	40	38

Table 7 shows that 38 per cent of the respondents had experience of 25 years in coconut cultivation, while 37 per cent were experienced 11-25 years, 14 per cent of the respondents having experience between 6-10 years and 11 per cent of respondents had experience of less than 5 years in coconut cultivation. This might be due to the fact that coconut was considered as a traditional crop as well as primary income source of respondents in study area. A similar result was reported by Fayas (2003) and Sasankan (2004).

#### 4.1.3. Education

Table 8. Percentage and frequency distribution of coconut based homestead farmers with respect to their education

(n = 105)

Sl. No.	Category	Frequency	Percentage
1.	Illiterate	17	16
2.	Primary School	44	42
3.	Secondary School	33	31
4.	Collegiate	11	11

The results of the study show (Table 8) that almost all the coconut based homestead farmers (84%) were literate. The illiterate category were only 16 per cent. This result is a reflection of the higher literacy rate of Kerala State. This result shows that today's farmers are fully educationally forward. Similar results have been obtained by several researchers viz., Singh (1996), Sakthivel (2000), Jaganathan (2004) and Sasankan (2004).

#### 4.1.4. Livestock possession

Table 9. Percentage and frequency distribution of coconut based homestead farmers according to their livestock possession

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1	Low	< 0.4846	16	15
2.	Medium	0.4846 – 3.3629	74	71
3.	High	≤ 3.3629	15	14

Mean = 1.92

SD = 1.43

A perusal of the Table 9 reveals that majority of the respondents (71%) had medium livestock component along with agriculture and 15 per cent of the respondents belonging to low category. Only 14 per cent of the respondents were found to have high livestock component. It is interesting to note that livestock component is a main part of coconut based homestead in Kerala. Organic farming and animal husbandry were the two key components of the coconut based homesteads and were inseparable. The result is in line with the finding of Helen (1990) and Jaganathan (2004).

#### 4.1.5. Training attended

Table 10. Percentage and frequency distribution of coconut based homestead farmers training which they have received

(n = 105)

Sl. No.	Category	Frequency	Percentage
1.	No Training	97	92
2.	One Training	7	7
3.	Two Training	0	0
4.	Three or More Training	1	1

It is clear from the Table 10 that majority of the respondents (92%) had not attended or received any training during the last three years.

The medium level of information seeking behaviour might have been the reason for the low level of training attended by the respondents. Similar result was reported by Lakshmi (2000) and Meera (2001).

#### 4.1.6. Risk orientation

Table 11. Percentage and frequency distribution of coconut based homestead farmers according to their risk orientation

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 12.11	16	15
2.	Medium	12.11 – 19.93	69	66
3.	High	> 19.93	20	19

Mean = 16.02

SD = 3.90

Table 11 clearly shows that majority of the respondents (66%) were under medium level category of risk orientation, 15 per cent were under low and 19 per cent were under high category.

Risk taking ability is an essential component in the adoption of organic farming practices in coconut based homestead farming. Organic farming in any cultivation, farmers have to spend more on inputs in initial years and they have to take certain amount of risk in practicing organic farming. All these factors might have contributed to the medium level of risk orientation by coconut based homestead growers. This finding is in line with finding of Fayas (2003).

#### 4.1.7. Self confidence

Table 12. Percentage and frequency distribution of coconut based homestead farmers according to their self confidence

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 15.07	16	15
2.	Medium	15.07 – 23.19	74	71
3.	High	> 23.19	15	14

Mean = 19.13      SD = 4.06

It is observed from the Table 12, that majority of the respondents (71%) had medium level of self confidence which might be due to the slow disappearance of future insecurity, it indicated that the farmers were well aware of the economics of organic coconut cultivation. Similar result was reported by Sasankan (2004) and Jaganathan (2004) in their studies.

#### 4.1.8. Innovativeness

Table 13. Percentage and frequency distribution of coconut based homestead farmers according to their innovativeness

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 0.544	13	12
2.	Medium	0.544 – 2.427	72	69
3.	High	> 2.427	20	19

Mean = 1.48

SD = 0.94

Majority of the respondents (69%) had medium level innovativeness followed by high (19%) and low (12%) level of innovativeness in organic farming practices (Table 13).

Now, Government of India has launched several organic farming programmes to promote the export of organic products from India. Farmers adopt organic farming with the technical assistance provided by the extension functionaries of State Department of Agriculture, Kerala Agricultural University and financial assistance by the Coconut Development Board. The innovative spirit of the farmers also has increased due to their motivation towards high information seeking behaviour and medium risk orientation. Jaganathan (2004) and Sasankan (2004) also reported similar results in their studies.

#### 4.1.9. Market perception

Table 14. Percentage and frequency distribution of coconut based homestead farmers according to their market perception

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 1.70	12	11
2.	Medium	1.70 – 4.73	65	62
3.	High	> 4.73	28	27

Mean = 3.219

SD = 1.518

Table 14 clearly indicates that 62 per cent of the respondents had medium level of market perception followed by high (27%) and low (11%) levels of market perception.

The medium level of information seeking behaviour, innovativeness and knowledge might be the reasons for medium level of market perception among the majority of the respondents. This finding is in accordance with the results of Suthan (2003) and Jaganathan (2004).

#### 4.1.10. Environmental orientation

Table 15. Percentage and frequency distribution of coconut based homestead farmers with respect to their environmental orientation

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 3.80	7	7
2.	Medium	3.80 – 5.45	87	83
3.	High	> 5.45	11	10

Mean = 4.62

SD = 0.82



Table 15 indicates that 83 per cent of the respondents had medium environmental orientation followed by high (10%) and low (7%) level of environmental orientation. This might be due to the high level of literacy rate, and medium level of information seeking behaviour. Frequent media coverage on environmental hazards could also be a reason for high concern about environment by the respondents.

#### 4.1.11. Information seeking behaviour

Table 16. Percentage and frequency distribution of coconut based homestead farmers according to their information seeking behaviour

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 8.03	30	29
2.	Medium	8.03 – 15.40	54	51
3.	High	> 15.40	21	20

Mean = 11.72      SD = 3.68

51 per cent of the respondents had medium level of information seeking behaviour followed by low (29%) and high (20%) level of information seeking behaviour (Table 16). The limited access to magazines, newspapers, scientists and Agriculture Officers might be the reasons for medium level of information seeking behaviour observed among majority of the respondents. Similar results have been obtained by Beena (2002) and Venkattakumar (1999) in their studies.

#### 4.2. AWARENESS OF COCONUT BASED HOMESTEAD FARMERS ABOUT ORGANIC FARMING PRACTICES

The extent of awareness of farmers on various organic farming practices in coconut cultivation is discussed in this section.

Table 17. Percentage and frequency distribution of coconut based homestead farmers according to their awareness about organic farming practices

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 43.68	13	12
2.	Medium	43.68 – 60.12	76	73
3.	High	> 80.12	16	15

Mean = 61.90      SD = 18.21

Seventy three per cent of the respondents had medium level of awareness, followed by high (15%) and low (12%) level of awareness (Table 17). Fifty per cent of the farmers had awareness index between 50 and 75 (between  $Q_1$  and  $Q_2$ ) and 25 per cent had more than 75 per cent knowledge index (Fig. 5).

High literacy rate among the respondents and medium level of information seeking behaviour might be the reasons for medium level of awareness. Besides the State Department of Agriculture promoted organic farming practices through various extension programmes. The Coconut Development Board is fully engaged in various development activities to promote organic farming practices among coconut growers. Presently Kerala Agricultural University has paid more attention towards awareness training programmes on organic farming through central training scheme under Department of Agricultural Extension, College of Agriculture, Vellayani. Mass media such as newspapers, radio, television also play a vital role in creating awareness among farmers about organic farming. All these factors together would have influenced coconut based homestead growers to attain medium and high level of awareness about organic farming practices in coconut cultivation.

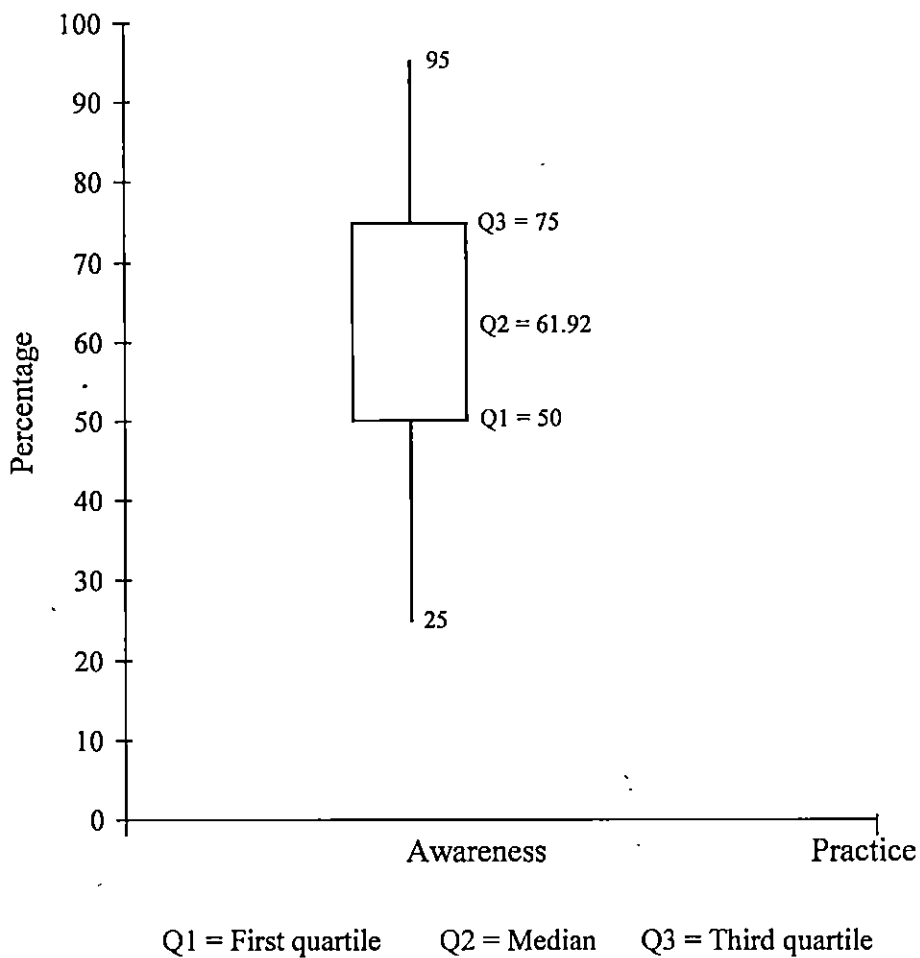


Fig. 5. Distribution of coconut based homestead farmers according to their awareness index towards organic farming practices

Similar results have been reported by Krishnamurthy (1999), Thyagarajan *et al.* (2001) and Jaganathan (2004) in their investigations on organic farming.

Table 18. Awareness of the coconut based homestead farmers about organic farming practices

(n = 105)

Sl. No.	Organic farming	Aware (%)	Not aware (%)
1.	Mother palm selection	57	43
2.	Selection of nuts from organically grown palms	40	60
3.	<i>In situ</i> incorporation of crop residues	70	30
4.	Raising green manure and incorporation	73	27
5.	Cover cropping	45	55
6.	Timely irrigation	91	9
7.	Husk burial	90	10
8.	Mulching the manure circle	89	11
9.	<i>In situ</i> vermicomposting	25	75
10.	Coir pith composting	41	59
11.	Application of FYM	94	6
12.	Application of poultry manure	90	10
13.	Intercropping	75	25
14.	Biological control of pests	47	53
15.	Use of botanical pesticides	50	50
16.	Summer ploughing	67	33
17.	Hand / Mechanical weeding	56	44
18.	Collection and destruction of pests	47	53
19.	Application of biofertilizer	12	88
20.	Use of traps	39	61

From the Table 18, it is clear that majority of the farmers were aware of the practices like timely irrigation, husk burial, mulching the manure circle, application of FYM and poultry manure and intercropping ranging from 75 to 95 per cent.

A possible reason for the high percentage of awareness about the above practices may be attributed to the tradition of tree farming which has been passed on from generation to generation. The importance of water conservation and the availability of mulch materials might have prompted farmers to practice mulching during summer months.

Availability of coconut husk and traditional nature of this practice might have contributed to more number of respondents reporting awareness about this practice.

Apart from that many of the programmes like seminars, workshops organized by the Coconut Development Board, Kerala Agricultural University and State Department of Agriculture might have increased farmers awareness in these aspects.

Practices like mother palm selection, use of botanical pesticides, *in situ* incorporation of crop residues, raising green manure and incorporation, summer ploughing and hand / mechanical weeding were aware to the extent of 50 to 74 per cent.

Majority of the farmers are having close contact with officials of Krishibhavan. This might have provided them an opportunity to establish close interaction with extension officers and discuss on new technologies. The scientists from Kerala Agricultural University also participated in the question and answer sessions favourably towards organic farming practices. All these factors might have contributed to 50 to 74 per cent level of awareness regarding the above practices.

Selection of nuts from organically grown palms, cover cropping, coir pith composting, biological control of pests, collection and destruction of pests and use of traps were aware to the extent of 35 to 50 per cent.

*In situ* vermicomposting and application of biofertilizers had not been popularized on a large scale to the farmers. Percentage of awareness of these two practices were 24.76 and 12.38 respectively. One probable reason could be due to non-visible and non-observable effect of biofertilizers and their low availability. Apart from that lack of training might have been the other reason for low awareness. These technologies have been introduced recently and it might not have percolated to the farmers level. It is clear from the findings that majority of the coconut based homestead farmers had medium level of awareness about organic farming practices. The result is in line with Sriram (1997) and Jaganathan (2004).

#### 4.3. KNOWLEDGE OF COCONUT BASED HOMESTEAD GROWERS ABOUT ORGANIC FARMING PRACTICES

Table 19. Percentage and frequency distribution of coconut based homestead farmers according to knowledge index about organic farming practices

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 47.12	12	11
2.	Medium	47.12 – 80.83	71	68
3.	High	> 80.83	22	21

Mean = 63.97

SD = 16.85

Table 19 reveals that majority of the coconut based homestead growers (68%) had medium level of knowledge followed by high (21%) level of knowledge and low (11%) levels of knowledge about organic farming practices in coconut cultivation. Fifty per cent of the farmers had knowledge index on organic farming between 26.5 and 79.5 (between (Q<sub>1</sub> and Q<sub>2</sub>) and 25 per cent had more than 79.5 per cent knowledge index (Q<sub>2</sub>) (Fig. 6).

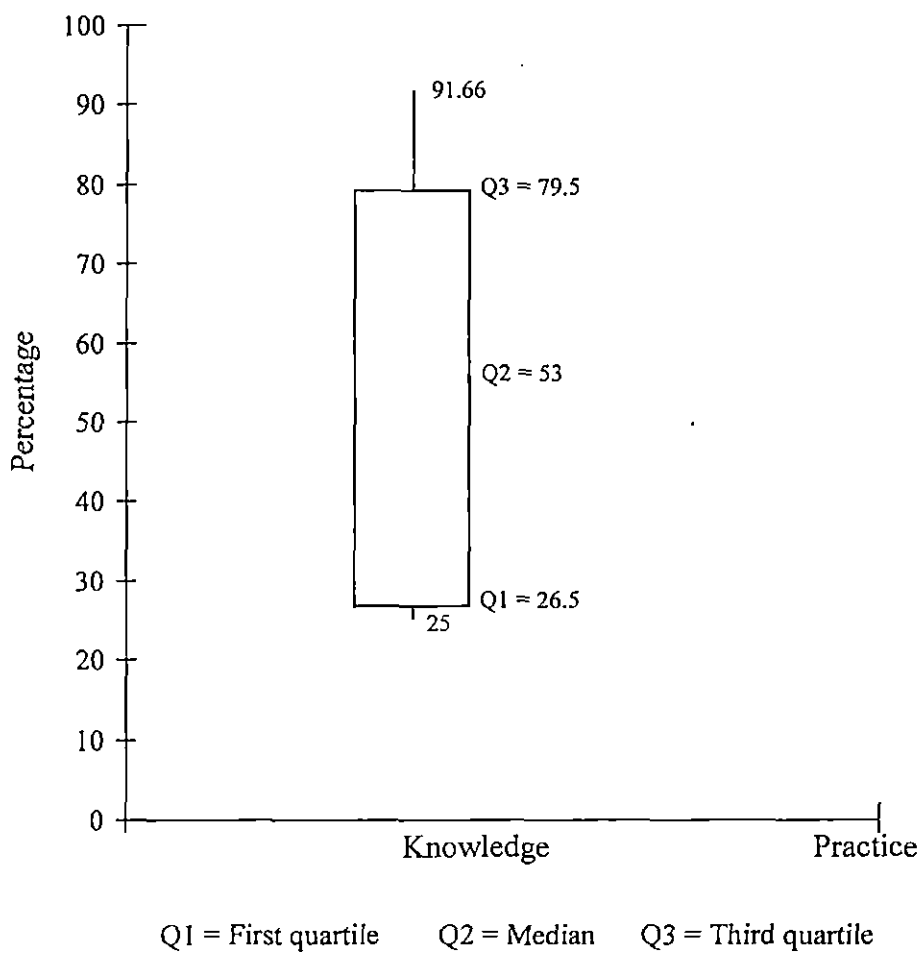


Fig. 6. Distribution of coconut based homestead farmers according to their knowledge index towards organic farming practices

The awareness about organic farming practices had resulted in developing an interest in gathering more information. The information and communication technologies available and the recent positive support given for promotion of organic farming by the government and other agencies might have helped the coconut based homestead growers to know more about organic farming practices.

High literacy rate, education level and medium and high information seeking behaviour might have widened the knowledge on organic farming practices. Awareness programmes, training and extension activities conducted by Coconut Development Board, State Department of Agriculture and Kerala Agricultural University might have also influenced the knowledge level of growers on organic farming. It is clear that majority of the coconut based homestead growers belong to medium category with respect to knowledge about organic farming practices. This finding is in agreement with the earlier studies of Singh (2004) and Jaganathan (2004).

#### 4.4. ATTITUDE OF COCONUT BASED HOMESTEAD FARMERS TOWARDS ORGANIC FARMING PRACTICES

Farmers attitude towards organic farming practices was studied by a scale developed by Jaganathan (2004) with slight modifications and findings are presented in Table 20 and Fig. 7.

Table 20. Percentage and frequency distribution of the coconut based homestead farmers according to their attitude towards organic farming practices

(n = 105)

Sl. No.	Category	Score range	Frequency	Percentage
1.	Less favourable	< 16.80	13	12
2.	Favourable	16.80 – 26.92	73	70
3.	Most favourable	> 26.92	19	18

Mean = 21.86

SD = 5.06



Table 20, depicts that the majority of respondents (70%) had favourable attitude towards organic farming practices followed by most favourable attitude (18%) and less favourable attitude (12%). Fifty per cent of the farmers had attitude towards organic farming between 18 and 26 (between Q1 and Q2) and 25 per cent had more than 26 score of attitude (Fig. 7). The awareness and knowledge about organic farming practices might have led them to develop an interest towards organic farming.

Presenting of results of the research conducted by Central Plantation Crop Research Institute and Kerala Agricultural University in the farmers meetings had positive effect in develop favourable attitude towards organic farming. Further, workshops, meetings, exhibitions and various extension activities conducted by Coconut Development Board, State Department of Agriculture and Kerala Agricultural University have been effective in dissemination of information and to create favourable attitude among respondents on organic farming.

Publishing articles in newspapers, broadcasting and telecasting programmes on organic farming practices through All India radio, Dooradarshan and Asianet also have acted as catalysts in forming favourable attitude towards organic farming practices. Soil degradation and pest resurgence are the result of indiscriminate use of pesticides and chemical fertilizers. High pest and disease incidences are affecting both the quality and quantity of the coconut yield. Low quantity of organic manure application within the homesteads and overuse of agrochemicals in coconut cultivation had affected the soil fertility status and related nutrient disorders. These factors also would have favourably influenced the farmers to change their attitudes in favour of organic farming practices.

It is clear from the findings that the majority of respondents had favourable attitude towards organic farming practices.

Jaganathan (2004) also reported similar trend in his study.

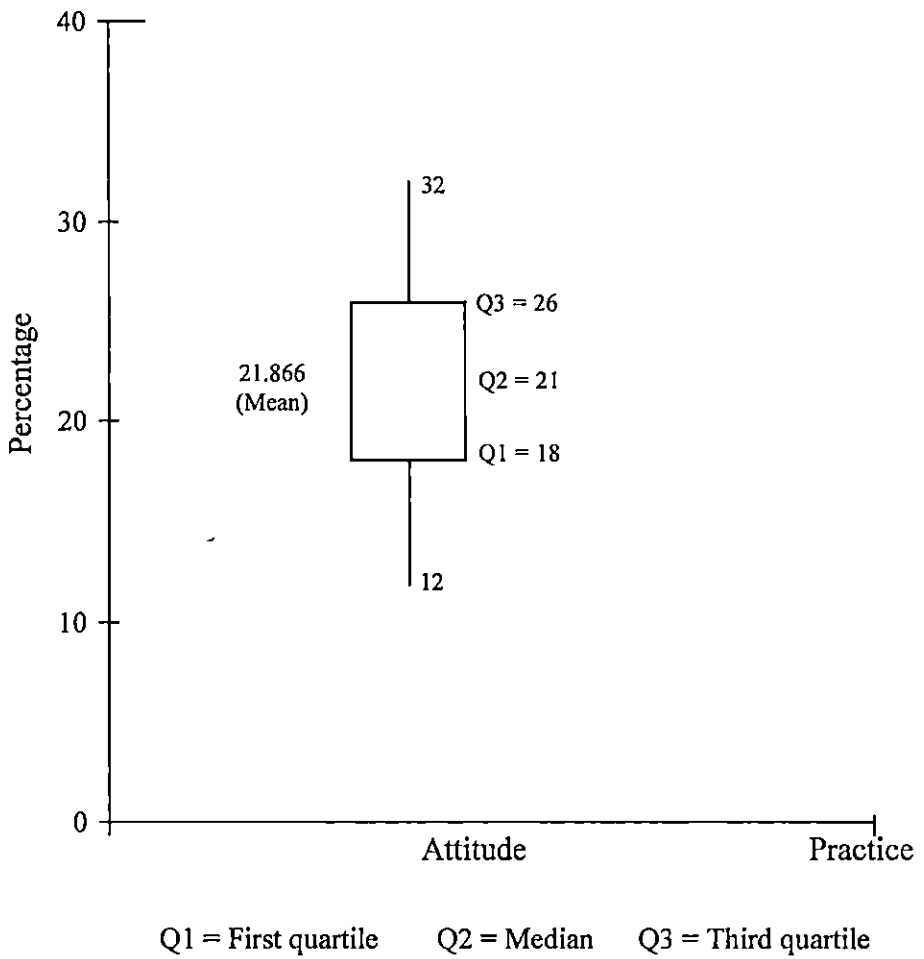


Fig. 7. Distribution of coconut based homestead farmers according to their attitude towards organic farming practices

#### 4.5 ADOPTION OF ORGANIC FARMING PRACTICES BY THE COCONUT BASED HOMESTEAD FARMERS

Table 21. Percentage and frequency distribution of coconut based homestead farmers according to their adoption of organic farming practices

(n = 105)

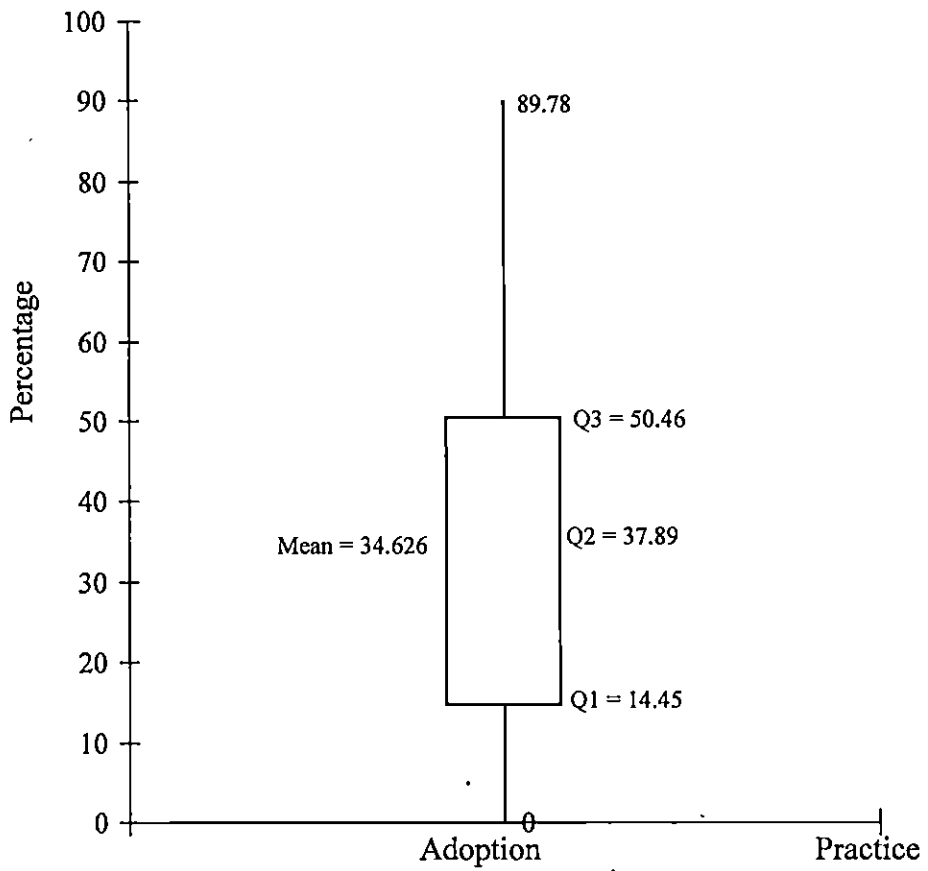
Sl. No.	Category	Score range	Frequency	Percentage
1.	Low	< 14.68	27	26
2.	Medium	14.68 – 54.56	63	60
3.	High	> 54.56	15	14

Mean = 34.62

SD = 19.94

Table 21 shows that majority of the respondents (60%) had medium level of adoption followed by low (26%) and high (14%) level of adoption of organic farming practices. Fifty per cent of the farmers had adoption index on organic farming between 14.45 and 50.46 (between  $Q_1$  and  $Q_2$ ) and 25 per cent had more than 50.46 adoption index (Fig. 8). Cultivation of minor crops with coconut is the main occupation of the respondents in the study area. Further coconut is an essential commodity in the day today life, farmers are interested in integrating the livestock component in coconut based homesteads to earn high income and thereby increasing the living standard. The agro-climatic conditions as well as preferential nature of farmers in cultivating plants around their dwelling units might be the reasons for the medium level of adoption. Since they have realized the health hazards, environmental pollution and high cost of chemical inputs farmers decided to adopt organic farming practices to sustain their cultivation.

Acquiring new information on an existing practice has led growers to alter some traditional agronomic practices to test the difference between new and old practices. Hence the level of awareness and adoption of the resource sustaining agricultural practices were medium among respondents.



Q1 = First quartile    Q2 = Median    Q3 = Third quartile

Fig. 8. Distribution of coconut based homestead farmers according to their adoption index towards organic farming practices

The findings of this study are in agreement with the results of the investigation of Kavitha (1998), Fayas (2003) and Jaganathan (2004).

Table 22. Extent of adoption of different organic farming practices by the coconut based homestead farmers

(n = 105)

Sl. No.	Organic farming practices	Adopted (%)	Partially adopted (%)	Not adopted (%)
1.	Summer ploughing	30	17	53
2.	<i>In situ</i> incorporation of crop residues	49	12	39
3.	Raising green manure and incorporation	41	11	48
4.	Mother palm selection	11	12	77
5.	Selection of nuts from organically grown palms	6	10	84
6.	Cover cropping	12	22	66
7.	Resistant/Tolerant variety	11	12	77
8.	Timely irrigation	24	24	52
9.	Husk burial	37	27	36
10.	Mulching the manure circle	33	21	46
11.	<i>In situ</i> vermicomposting	7	7	86
12.	Coir pith composting	10	8	82
13.	Application of FYM	29	21	50
14.	Application of poultry manure	29	21	50
15.	Intercropping	25	28	47
16.	Application of oil cakes	8	10	82
17.	Application of biofertilizer	2	4	94
18.	Hand/Mechanical weeding	27	31	42
19.	Use of botanical pesticides	5	18	77
20.	Use of traps	9	11	80

The factors which create favourable condition to increase awareness, knowledge and attitude also affect positively towards adoption of the organic farming. Practices like *in situ* incorporation of crop residues, raising green manure and incorporation, husk burial, mulching, application of FYM and poultry manure have shown the high rate of adoption (Table 22). These traditional practices are cheap and it might be the reason for the higher adoption. Coconut husk is being a cheap and commonly available agro-waste in homesteads, the respondents might have used it in their homesteads.

Since coconut palms are utilizing 1/3 of the land area, *in situ* incorporation of crop residue is possible and are practiced by coconut based homestead farmers.

Possession of livestock is an essential component in most of the homesteads. The data indicated that respondents in the study had medium and high level of livestock possession. The cow dung collected from the shed is either applied to the coconut palms or kept in heaps or pits for future use after composting. Similarly poultry manure also is used for coconut. Husk burial is carried out in between coconut palms or around the basins of palms. This is done especially for soil moisture conservation.

Mulching around the basin is another simple, cheap and common practice which is adopted by the respondents. Almost one third of the farmers (33%) were adopting this practice to conserve soil moisture and to provide organic matter to the basin. Coconut husk, fronds, and bunch stalks were the commonly used mulching materials. Summer ploughing which is carried out at the end of dry spell for moisture conservation.

Although, irrigation is very important as far as coconut yield is concerned, only 24 per cent of the farmers had adopted this practice. This is because of lack of facilities for irrigation.

According to the research findings of Central Plantation Crops Research Institute and Kerala Agricultural University, intercropping in coconut lands should be practiced without affecting the growth performance of coconut palm. In the present study area, only 25 per cent of the farmers adopted intercropping as per the recommendations, even though additional income throughout the year and maximum utilization of small block of land were possible. The reasons for the lower adoption rate of this practice could be the low awareness, lack of labour and difficulties in marketing the produce at high price.

In this study area 27 per cent of the respondents adopted hand/mechanical weeding because it is easy and cost effective.

Practices like selection of mother palm, nuts from organically grown palms, cover cropping, resistant / tolerant varieties, coir pith composting, application of oil cakes and use of traps were hardly adopted by the respondents. Special knowledge is required for the adoption of certain practices such as vermicomposting, coir pith composting and use of traps (Pheromone traps). It is seen that only a few farmers (7%, 10% and 9% respectively) adopted these practices. Technical difficulties in the preparation of vermicomposting and coir pith composting might be the reasons for low level of adoption. The extent of awareness and knowledge regarding the above practices were also very low. Hence all these factors might have resulted in the low level of adoption.

Use of botanical pesticides and application of biofertilizers by the respondents were very low (5 per cent and 2 per cent respectively). Lack of awareness and unavailability of botanical pesticides might be the reasons for low adoption. Farmers are using plant based preparations made from neem (*Azadirachta indica*) such as neem kernal decoction and neem oil to protect the crops from pests. Farmers are using neem based preparations for the control of coconut mite. Farmers are using a common weed found in Kerala *Clorodendran infortunatum* for prevention of black beetle attack.

#### 4.6 APPLICATION OF INORGANIC AND ORGANIC FERTILIZER AMONG THE COCONUT BASED HOMESTEAD FARMERS

Table 23. Application of inorganic and organic fertilizers among the coconut based homestead farmers

(n = 105)

Sl. No.	Category	Frequency	Percentage
1.	Organic + Inorganic	46	44
2.	Only inorganic	22	21
3.	Only organic	7	6
4	No fertilizer	30	29

As seen from Table 23 and Fig. 9, the majority of the respondents (44 %) applied organic as well as inorganic fertilizers for coconut, twenty nine per cent of the respondents applied neither organic manure nor inorganic fertilizer. Percentage of inorganic fertilizer application among the respondents was 21 per cent whereas six per cent of the respondents applied only organic fertilizers for their coconut cultivation. Sixty five per cent of the respondents applied inorganic fertilizer. The reasons for higher adoption rate of inorganic fertilizers are quick response, readily available and per palm requirement is also low while comparing with organic manures.

The level of awareness, knowledge and information seeking behaviour also might have contributed for increased fertilizer application tendency.

Due to poor economic status of most of the farmers, they could not apply fertilizer for coconut. Lack of convictions about the economic feasibility of fertilizer application, high cost of fertilizers, wrong notion among the farmers that application of fertilizer will spoil the soil health. By products of coconut viz., petiole, frond, stipules, spadix (bunch stalk and spathe), husk and shell are mainly used as energy source (by burning). These might be the reasons for not applying any fertilizer for the coconut.



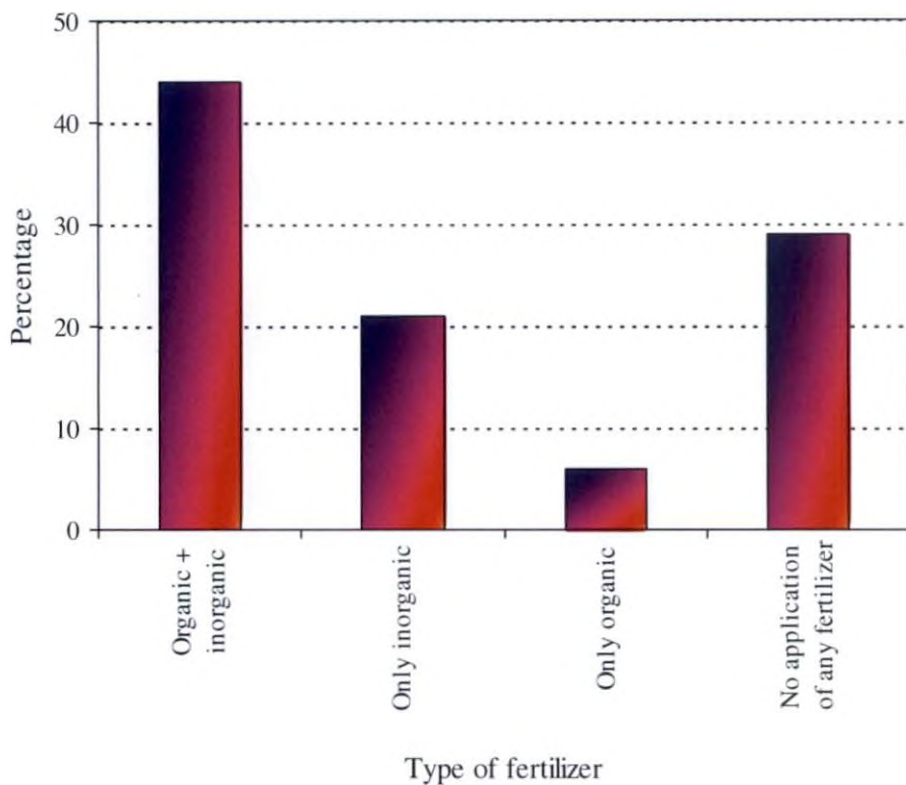


Fig. 9. Application of inorganic and organic fertilizers among the coconut based homestead farmers

Planting of resistant/tolerant varieties was adopted by only 11 per cent of the respondents. It might be due to unavailability of such varieties, lack of knowledge and awareness. In addition traditionally they might have believed that old varieties were superior than recently released varieties.

From the data, it was found that majority of the coconut based homestead growers (60%) belonged to medium category in adopting organic farming practices.

#### 4.7. RELATIONSHIP BETWEEN THE CHARACTERISTICS OF THE COCONUT BASED HOMESTEAD FARMERS AND THE EXTENT OF AWARENESS, KNOWLEDGE, ATTITUDE AND ADOPTION.

The socioeconomic and psychological characteristics of coconut based homestead farmers played a vital role in determining their awareness, knowledge, attitude and adoption of organic farming practices. The correlation analysis was carried out to assess the relationship between characteristics of respondents and the dependent variables such as awareness, knowledge, attitude and adoption. The correlation coefficient was worked out and the significance was tested by comparing with the table values. The results are presented below.

##### **4.7.1. Relationship between the characteristics of coconut based homestead farmers and awareness about organic farming practices**

It could be observed from the Table 23 that independent variables viz., education, innovativeness, risk orientation, market perception, self confidence and information seeking behaviour had significant and positive relationship with awareness (Fig. 10).

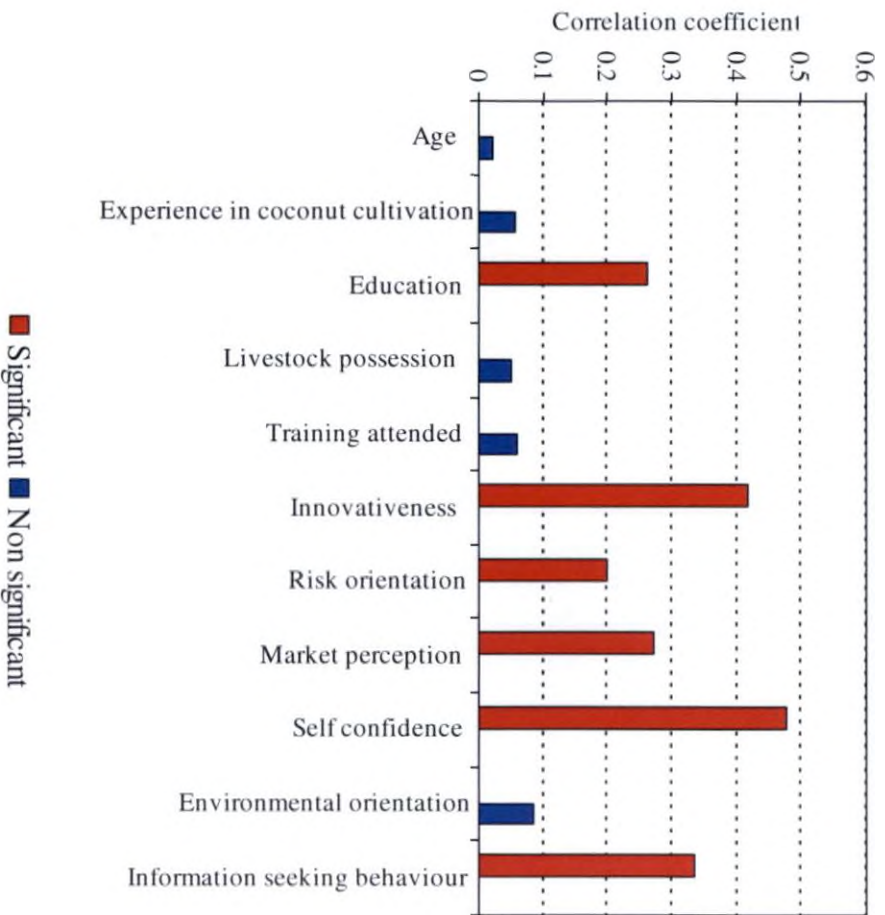


Fig. 10. Relationship between the characteristics of coconut based homestead farmers and awareness about organic farming practices

Table 24. Relationship between the characteristics of coconut based homestead farmers and awareness about organic farming practices

(n = 105)

Sl. No.	Independent variables	Correlation coefficient (r)
1.	Age	0.0227 <sup>NS</sup>
2.	Experience in coconut cultivation	0.0558 <sup>NS</sup>
3.	Education	0.2629 <sup>**</sup>
4.	Livestock possession	0.0514 <sup>NS</sup>
5.	Training attended	0.0611 <sup>NS</sup>
6.	Innovativeness	0.4171 <sup>**</sup>
7.	Risk orientation	0.1985 <sup>*</sup>
8.	Market perception	0.2706 <sup>**</sup>
9.	Self confidence	0.4764 <sup>**</sup>
10.	Environmental orientation	0.0860 <sup>NS</sup>
11.	Information seeking behaviour	0.3365 <sup>**</sup>

\* Significant at 5 per cent level

\*\* Significant at 1 per cent level

NS Non significant

Higher the education level, better would be the awareness. Education might have enabled these farmers to perceive the importance of the organic farming practices, especially in this progressive world of science. Education acts as a key to unlock all mental barriers. It would definitely result in desirable changes in human behaviour. There is significant and positive relationship between education level and awareness about organic farming practices (Table 24).

Similar results have been observed by Sriram (1997), Sriram and Palanisamy (1997), Gangadharan (1993) and Syakumar (1999) in their studies.

Innovativeness showed significant and positive relationship with awareness. Innovativeness can be defined as “the tendency of a farmer to be ready to take any new idea or technology” or in other words relatively early in accepting new ideas. So innovativeness plays a vital role in influencing the awareness of farmers. A highly innovative farmer always possess a high awareness. Similar finding was reported by Nelson (1992), Gangadharan (1993) and Jaganathan (2004).

A significant and positive relationship exists between risk orientation and awareness. A farmer who is willing to take risk in any organic farming practice, might be high in awareness level. Similar findings were reported by Gangadharan 1993, Sriram (1997) and Syamkumar (1999).

Market perception exhibited a significant and positive relationship with awareness. The ultimate motive of any farmer is marketing their produce at a higher price in competitive market. So market perception led to more awareness about organic farming practices.

A similar finding has been reported by Syakumar (1999) and Jaganathan (2004) in their studies.

There is a significant and positive relationship between self confidence and awareness. A farmer cultivating coconut by following organic farming methods faces risk and uncertainty like market fluctuations, unavailability of inputs, incidence of pest and diseases. A farmer with self confidence can take his own decisions in farming activities. Hence, positive and significant relationship between self confidence and awareness of organic farming practices could be observed.

Similar finding was reported by Syamkumar (1999) and Jaganathan (2004) in their studies.

Information seeking behaviour level of awareness showed a significant and positive relationship. Information seeking behaviour plays a vital role in gathering information on different information sources about organic farming. High literacy rate and well established information network would have been contributed towards farmers level of awareness of the organic farming practices.

#### 4.7.2. Relationship between the characteristics of coconut based homestead farmers and extent of knowledge on organic farming practices

Table 25. Relationship between the characteristics of coconut based homestead growers and knowledge on organic farming practices

(n = 105)

Sl. No.	Independent variables	Correlation coefficient (r)
1.	Age	0.1357 <sup>NS</sup>
2.	Experience in coconut cultivation	0.1256
3.	Education	0.4353 <sup>**</sup>
4.	Livestock possession	0.1321 <sup>NS</sup>
5.	Training attended	0.1028 <sup>NS</sup>
6.	Innovativeness	0.4489 <sup>**</sup>
7.	Risk orientation	0.2613 <sup>**</sup>
8.	Market perception	0.9096 <sup>**</sup>
9.	Self confidence	0.5138 <sup>**</sup>
10.	Environmental orientation	0.0822 <sup>NS</sup>
11.	Information seeking behaviour	0.4255 <sup>**</sup>
12.	Awareness	0.3959 <sup>**</sup>

\* Significant at 5 per cent level

\*\* Significant at 1 per cent level

NS Non significant

Knowledge of the coconut based homestead growers on organic farming practices had significant and positive relationship with education, innovativeness, risk orientation, market perception, self confidence and information seeking behaviour as presented in Table 25 and Fig. 11.

The higher knowledge level of farmers has been attributed to the high educational status.

Gangadharan (1993), Manju (1996), Sherief (1998), Manjusha (1999), Majjusha (2000) and Jaganathan (2004) have been reported similar observation.

Innovativeness exhibited significant and positive relationship with knowledge. More innovative farmer is curious to use all organic farming practices relatively earlier than other fellow farmers. It may be attributed to the farmer's interest in trying out new technologies in farming by self experimentation or through collaboration with research agencies. So that he is being honoured or recognized as a contact farmer or a model farmer. Similar result was reported by Gangadharan (1993), Manoj (2000), Venkatesan (2000) and Jaganathan (2004) in their investigations.

Risk orientation was found to have a significant and positive relationship with knowledge. This could be due to farmer's willingness bear risk for adopting organic farming practices. A farmer having more knowledge on organic farming, would have been exhibited high risk orientation level. Gangadharan (1993), Preetha (1997), Majjusha (2000), Manoj (2000) and Jaganathan (2004) also have been reported similar results in their studies.

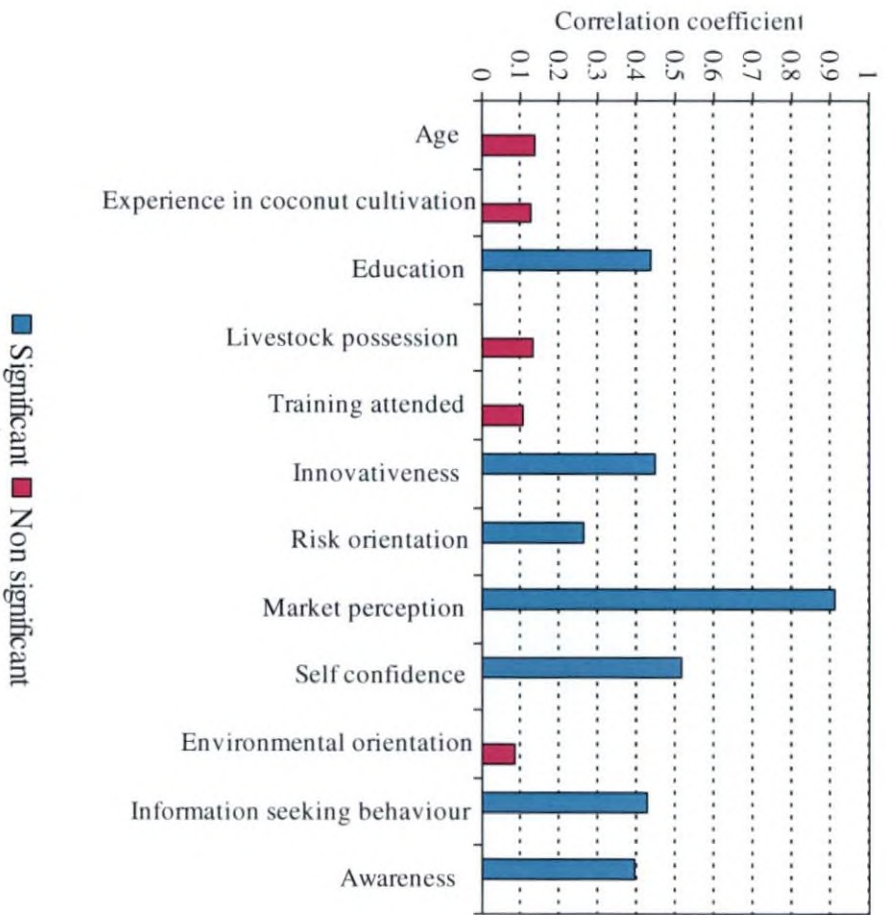


Fig. 11. Relationship between the characteristics of coconut based homestead farmers and knowledge about organic farming practices



Market perception had significant and positive relationship with knowledge. Market perception led to more awareness about organic farming. High market perception reflects more knowledge on market trend and price fluctuations. This might be the reason for the significant and positive relationship between market perception and knowledge on organic farming practices.

Self confidence showed significant and positive relationship with knowledge. This might have been due to farmers' faith in themselves and high esteem to face any challenge on farming. Hence, self confidence would have influenced the knowledge about organic farming practices. Jaganathan (2004) also observed a similar trend.

Significant and positive relationship existed between information seeking behaviour and knowledge. This could be attributed to increased level of exposure through print media, radio and television which regularly brought features and news items on organic farming practices.

This finding is in accordance with the earlier reports by Gangadharan (1993), Manju (1996) and Preetha (1997).

#### **4.7.3. Relationship between the characteristics of coconut homestead farmers and attitude towards organic farming practices**

The success of any agricultural technology mostly depends upon the favourable attitude of the farmers. Hence, the relationship between the attitude and the characteristics of coconut based homestead farmers was studied and is presented in Table 25 and Fig. 12.

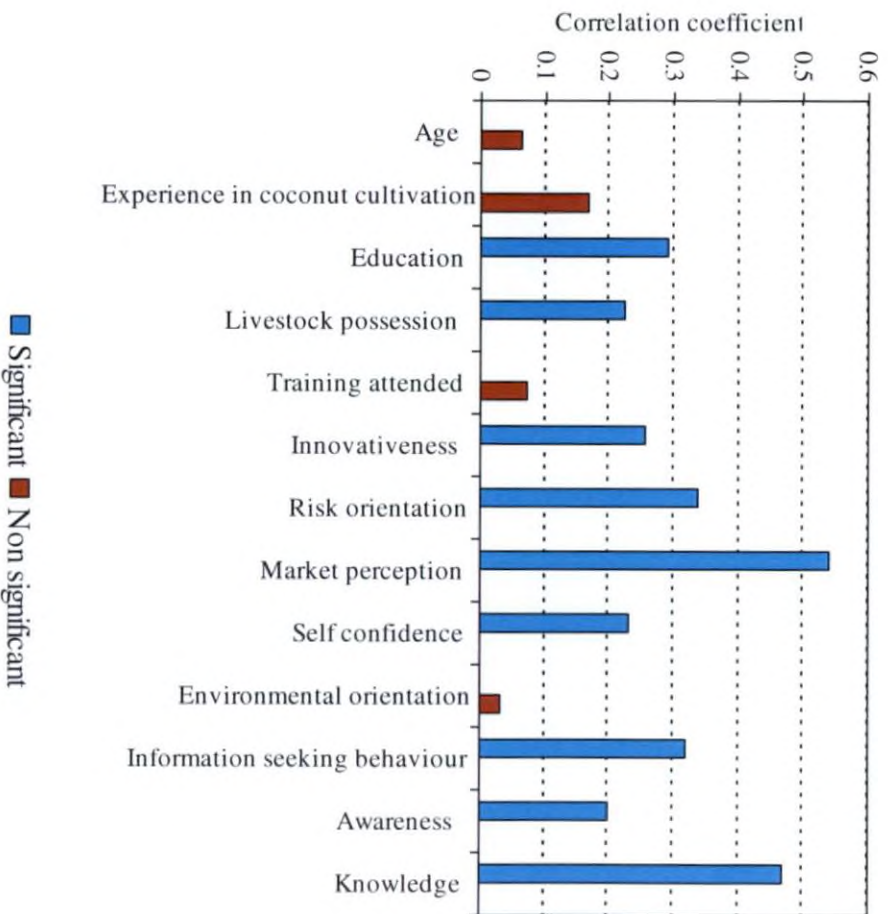


Fig. 12. Relationship between the characteristics of coconut based homestead farmers and attitude towards organic farming practices

Table 26. Relationship between the characteristics of coconut based homestead farmers and attitude towards organic farming practices

(n = 105)

Sl. No.	Independent variables	Correlation coefficient (r)
1.	Age	0.0619 <sup>NS</sup>
2.	Experience in coconut cultivation	0.1684 <sup>NS</sup>
3.	Education	0.2899 <sup>**</sup>
4.	Livestock possession	0.2230 <sup>**</sup>
5.	Training attended	0.0732 <sup>NS</sup>
6.	Innovativeness	0.2543 <sup>**</sup>
7.	Risk orientation	0.3376 <sup>**</sup>
8.	Market perception	0.5402 <sup>**</sup>
9.	Self confidence	0.2302 <sup>*</sup>
10.	Environmental orientation	0.0318 <sup>NS</sup>
11.	Information seeking behaviour	0.3201 <sup>**</sup>
12.	Awareness	0.1983 <sup>*</sup>
13.	Knowledge	0.4676 <sup>**</sup>

\* Significant at 5 per cent level

\*\* Significant at 1 per cent level

NS Non significant

The nine variables viz. education, livestock possession, innovativeness, risk orientation, market perception, self confidence, information seeking behaviour, awareness and knowledge showed a significant and positive relationship with attitude towards organic farming practices and are presented in Table 26 and Fig. 12.

Education had significant and positive relationship with attitude. Educated farmers are always curious with their environment and they are very keen about getting information on organic farming. Hence, they do not take decisions and make comments based on bias and prejudice. So, it might be the reason for their favourable attitude towards organic farming.

A similar finding was reported by Gangadharan (1993), Natarajan (1991), Varma (1996), Sriram (1997), Rajendralal (1997), Syakumar (1999) and Nath (2002).

Livestock possession showed significant and positive relationship with attitude. Livestock is one of the key component in homestead and respondents had medium livestock possession. Hence, they have knowledge on nutritional value of manures, its use and effects on crop. So, naturally they might be having favourable attitude towards organic farming.

Significant and positive relationship was observed between innovativeness and attitude towards organic farming practices. Farmers with more innovativeness would have been much interested in trying out new ideas and practices, as they are having favourable attitude on it.

Natarajan (1991), Gangadharan (1993), Varma (1996), Sriram (1997), Parvathy (2000) and Jaganathan (2004) also have been reported similar findings in their studies.

Risk orientation showed significant and positive relationship with attitude. This could be again due to farmer's willingness to take risk. Hence, it will create favourable attitude toward organic farming practices. Gangadharan (1993), Varma (1996), Sriram (1997) and Rajendralal (1997) also observed a similar trend.

There is a significant and positive relationship between attitude and market perception. Market perception capable of changing the attitude with the identification of market trend to sell the produce for greater returns. This might have changed the attitude of respondents in a favourable way. Finding was in line with Jaganathan (2004).

Self confidence was found to have a significant and positive relationship with attitude. Self confidence of farmers would always have led to try organic farming practices even before they were convinced about the merits. Besides this all these factors along with high information seeking behaviour and innovativeness might have resulted in forming favourable attitude on organic farming.

This result was in contrast with findings of Rajendralal (1997), Parvathy (2000) and Jaganathan (2004).

Information seeking behaviour had a significant and positive relationship with attitude. Various sources of information viz., print media, radio, television etc. play a vital role in dissemination of information on organic farming. High literacy rate and well established information network would have contributed to changing the awareness and attitude of farmers. This might be the reason for increased influence of information seeking behaviour on attitude towards organic farming.

A significant and positive relationship existed between awareness and attitude towards organic farming practices. High level of awareness regarding organic farming might have led to develop a favourable attitude. A similar result was reported by Jaganathan (2004).

Knowledge level of growers showed a significant and positive relationship with attitude. With the sound knowledge on organic farming practices, farmers

tend to test the same on an experimental basis. If the outcome is in conformity with expected one, they would have developed interest and favourable attitude towards those practices.

The results of the study was found to be conformity with the finding of Jaganathan (2004).

#### 4.7.4. Relationship between the characteristics of coconut based homestead farmers and adoption of organic farming practices

Relationship between the characteristics of coconut based homestead growers and adoption of organic farming practices was worked out and is furnished in Table 27 and Fig. 13.

Table 27. Relationship between the characteristics of coconut based homestead farmers and adoption of organic farming practices

(n = 105)

Sl. No.	Independent variables	Correlation coefficient (r)
1.	Age	0.0995 <sup>NS</sup>
2.	Experience in coconut cultivation	0.1167 <sup>NS</sup>
3.	Education	0.4834 <sup>**</sup>
4.	Livestock possession	0.1179 <sup>NS</sup>
5.	Training attended	0.0711 <sup>NS</sup>
6.	Innovativeness	0.3717 <sup>**</sup>
7.	Risk orientation	0.2730 <sup>**</sup>
8.	Market perception	0.8952 <sup>**</sup>
9.	Self confidence	0.5256 <sup>**</sup>
10.	Environmental orientation	0.0747 <sup>NS</sup>
11.	Information seeking behaviour	0.4383 <sup>**</sup>
12.	Awareness	0.3589 <sup>**</sup>
13.	Knowledge	0.9468 <sup>**</sup>
14.	Attitude	0.5867 <sup>**</sup>

\* Significant at 5 per cent level

\*\* Significant at 1 per cent level

NS Non significant

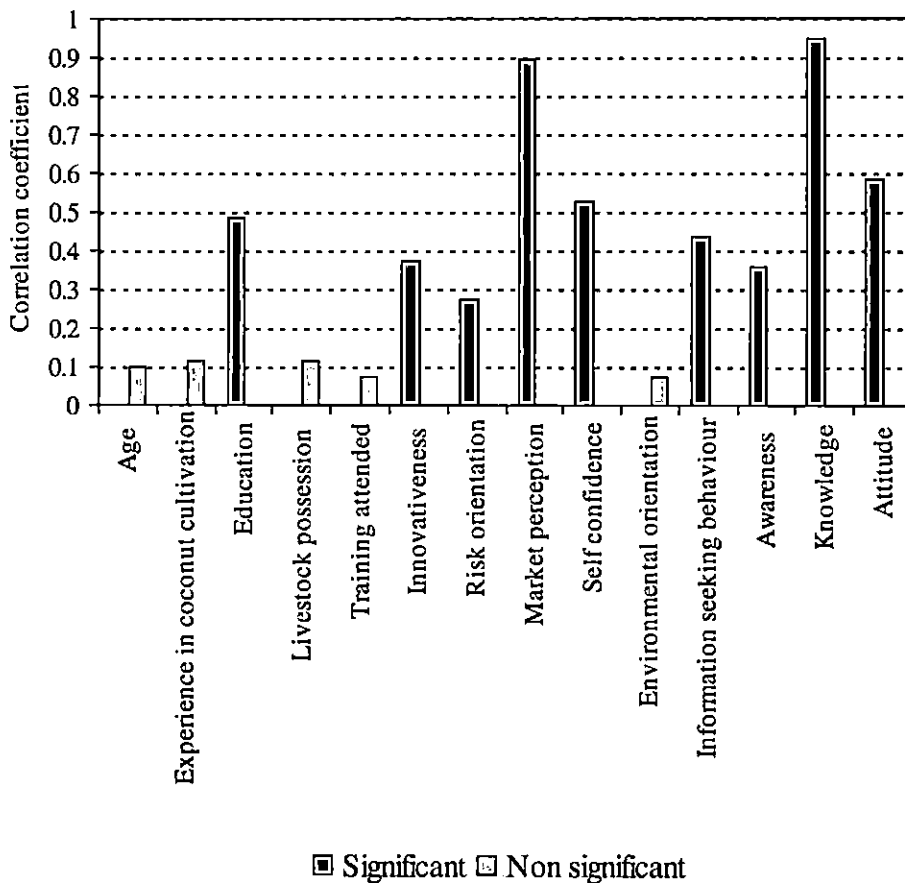


Fig. 13. Relationship between the characteristics of coconut based homestead farmers and adoption about organic farming practices

The independent variables viz., education, innovativeness, risk orientation, market perception, self confidence, information seeking behaviour, awareness, knowledge and attitude showed a significant and positive relationship with adoption. The three dependent variables viz., awareness, knowledge and attitude were also included among the independent variables in order to know the extent of relationship with adoption (Table 27 and Fig. 13).

Education showed significant and positive relationship with adoption. Educated farmers always interested in searching information sources getting knowledge and try to practice new ideas in their own fields. Hence, they have more opportunity to gather knowledge by interacting within and outside the social system. This would have aided towards greater adoption of organic farming practices. The finding was in line with the finding of Sriram (1997), Sudhakar (1998), Majjusha (2000) and Jaganathan (2004).

Innovativeness had a significant and positive relationship with adoption. Innovative farmers are always keen about their farming practices and progressive in outlook. Hence they tend to seek changes in their farming practices and eager to try or experiment new technologies in their own fields. This might have been the reason for adoption of organic farming practices.

A similar finding was reported by Sriram (1997), Noj (2000), Fayas (2003) and Jaganathan (2004) in their studies.

Risk orientation was found to have, significant and positive relationship with adoption. Farmer, who is willing to take risk farming, always tend to try out new technologies without hesitation. they are eager to adopt organic farming practices to test the outcome in their own fields. This might have been the reason for adoption of organic farming practices by them.



Sriram (1997), Preetha (1997), Sudhakar (1998), Venkatesan (2000) and Fayas (2003) also observed a similar trend. Market perception showed significant and positive relationship with adoption. Having realized the market trend of produce, it's demand and price etc. farmers are more tend to adopt organic farming practices. So, market perception might have led to more adoption of organic farming practices. A similar finding was also reported by Nizamudeen (1996).

Self confidence showed a significant and positive relationship with adoption. Self confidence makes farmers to develop ability to face risks. Self confidence level of farmers, determines the decisions for adopting organic farming practices. This might have been the reason for a significant and positive relationship between self confidence and adoption. Similar finding was reported by Jaganathan (2004). Information seeking behaviour exhibited significant and positive relationship with adoption. Farmers can gather information through various information soruces. Authentic information from reliable sources might have facilitated higher level of adoption.

Awareness exhibited a significant and positive relationship with adoption. With the increasing awareness farmers develop favourable attitude towards organic farming through their own experience which led to the higher level of adoption. Jaganathan (2004) also reported a similar trend in his study.

Knowledge is the prerequisite for adoption. A high level of knowledge on organic farming practices will make the farmers to take positive decisions on adoption. In this study, significant and positive relationship between knowledge and adoption proves this trend.

Attitude showed a significant and positive relationship with adoption. High level of awareness and knowledge might have also contributed to the farmers to change in the attitude of farmers. The study conforms to the results of Jaganathan (2004).

#### 4.8 A COMPARATIVE ANALYSIS OF INDEPENDENT VARIABLES AND DEPENDENT VARIABLES OF COCONUT BASED HOMESTEAD FARMERS

Table 28. A comparative analysis of independent and dependent variables of coconut based homestead farmers

Sl. No.	Independent variable	Awareness	Knowledge	Attitude	Adoption
X <sub>1</sub>	Age	NS (0.0227)	NS (0.1357)	NS (0.0619)	NS (0.0995)
X <sub>2</sub>	Experience in coconut cultivation	NS (0.0558)	NS (0.0256)	NS (0.1684)	NS (0.1167)
X <sub>3</sub>	Education	PS (0.2629)	PS (0.4353)	PS (0.2899)	PS (0.4834)
X <sub>4</sub>	Livestock possession	NS (0.0514)	NS (0.1321)	PS (0.2230)	NS (0.1179)
X <sub>5</sub>	Training attended	NS (0.0611)	NS (0.1028)	NS (0.0732)	NS (0.0711)
X <sub>6</sub>	Innovativeness	PS (0.4171)	PS (0.4489)	PS (0.2543)	PS (0.3717)
X <sub>7</sub>	Risk orientation	PS (0.1985)	PS (0.2613)	PS (0.3376)	PS (0.2730)
X <sub>8</sub>	Market perception	PS (0.2706)	PS (0.9096)	PS (0.5402)	PS (0.8952)
X <sub>9</sub>	Self confidence	PS (0.4764)	PS (0.5138)	PS (0.2302)	PS (0.5256)
X <sub>10</sub>	Environmental orientation	NS (0.0860)	NS (0.0822)	NS (0.0318)	NS (0.0747)
X <sub>11</sub>	Information seeking behaviour	PS (0.3365)	PS (0.4255)	PS (0.3201)	PS (0.4383)

PS - Positive and significant relationship      NS - Non significant relationship

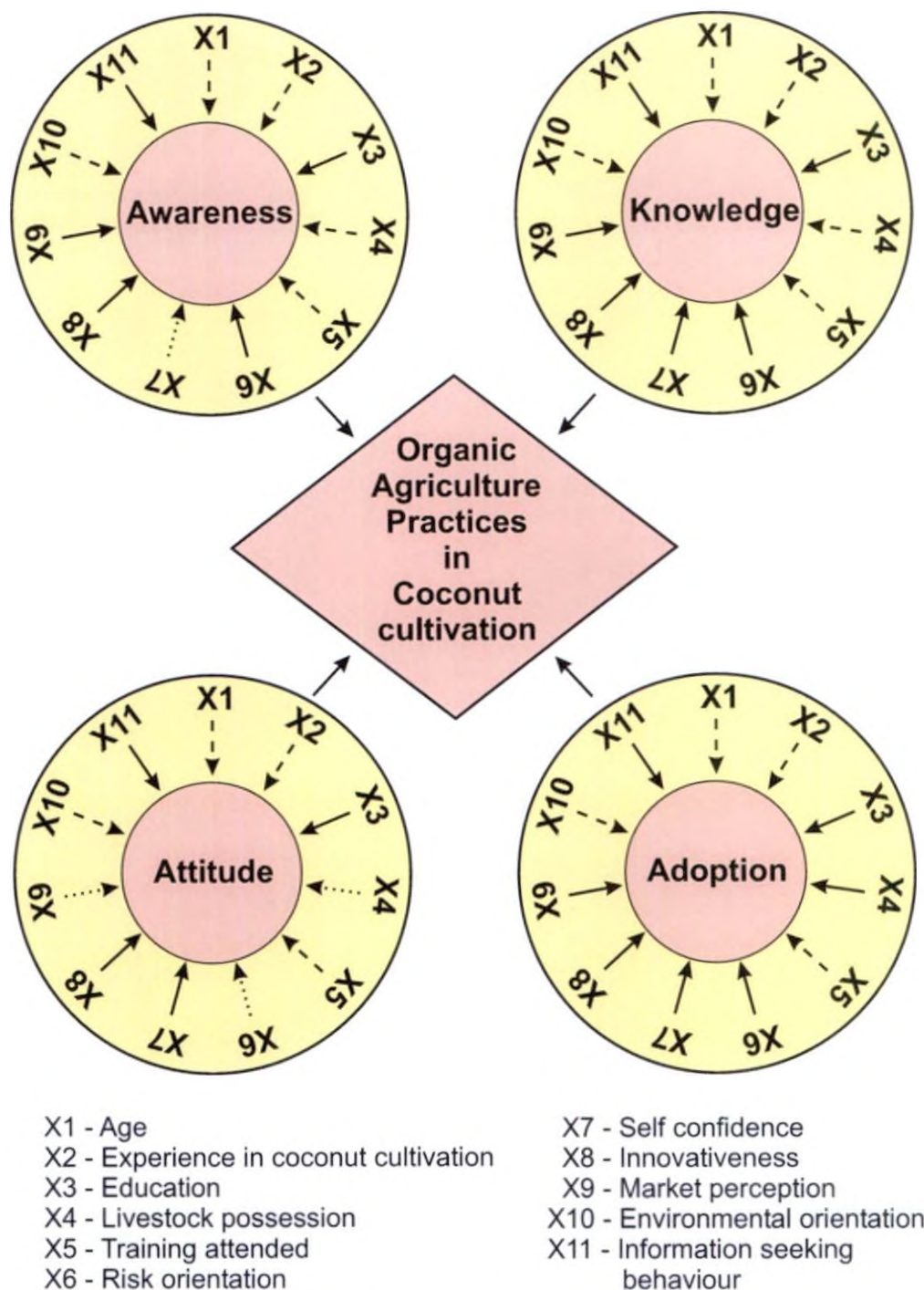


Fig. 14. Empirical model of the study

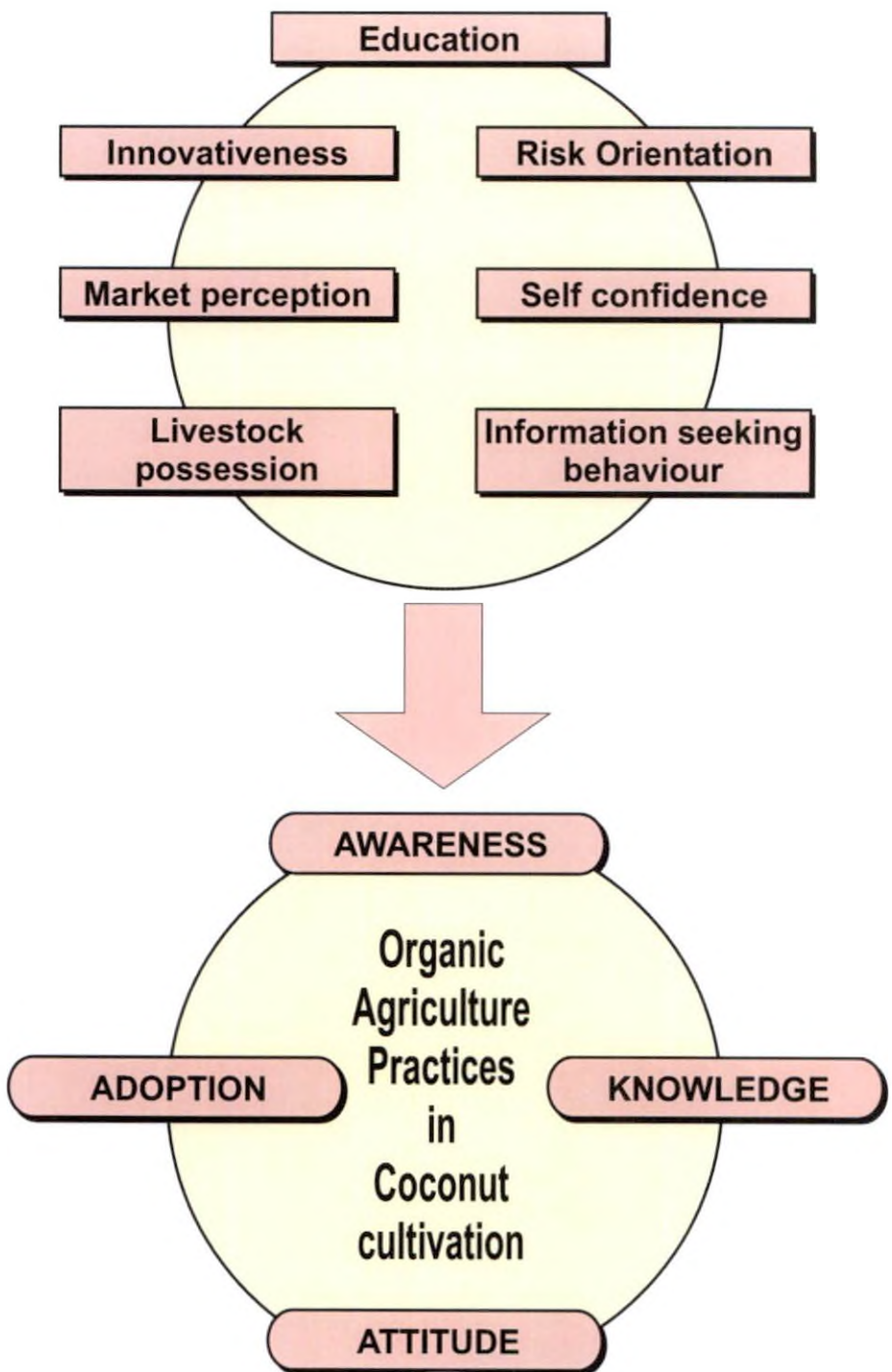


Fig. 15. Model of variables influencing organic farming practices

#### 4.11. CONSTRAINTS IN THE ADOPTION OF ORGANIC FARMING PRACTICES AS PERCEIVED BY THE COCONUT BASED HOMESTEAD FARMERS AND SUGGESTIONS FOR OVERCOMING THEM

The coconut based homestead farmers were interviewed with questionnaire to state the constraints in their order of importance which they faced in adopting the organic farming practices. These constraints were ranked on the importance based on their perception.

Table 29. Constraints in the adoption of organic farming practices as perceived by the coconut based homestead farmers

(n = 105)

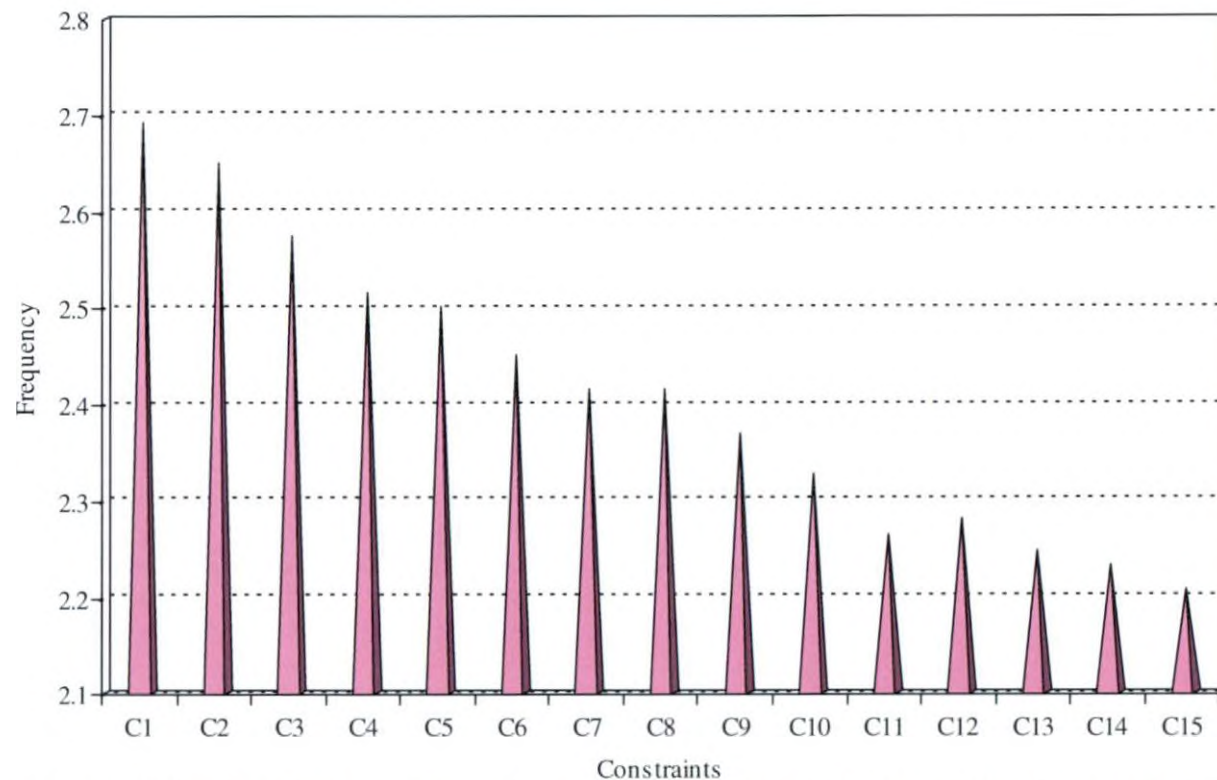
Sl. No.	Constraints	Cumulative index Frequency of response	Rank
1.	Lack of sufficient good quality seed nuts / seedlings	2.24	XII
2.	Non-availability of inputs	2.28	X
3.	Extensive prevalence of pests and diseases	2.20	XIV
4.	Lack of awareness and knowledge about organic farming practices	2.26	XI
5.	Inadequate extension support	2.23	XIII
6.	Inadequate information about organic farming practices	2.19	XV
7.	High cost of organic inputs	2.69	I
8.	Lack of ready package for homestead coconut farming	2.57	III
9.	Non-availability of climbers for carrying out plant protection measures	2.5	V
10.	Lack of credit facilities	2.36	VIII
11.	Lack of subsidies	2.45	VI
12.	High labour charge	2.64	II
13.	Low premium for organic nuts	2.32	IX
14.	High transport cost of organic manure	2.41	VII
15.	Non-availability of organic inputs	2.51	IV

It is clear from the Table 29 that the most important constraint experienced by the coconut based homestead farmers was the high cost of organic inputs. Other constraints in the order of importance were high labour charge, lack of ready package for homestead farming, non-availability of organic inputs, non-availability of climbers, lack of subsidies, lack of credit facilities, low premium for organic nuts, non availability of inputs, lack of awareness and knowledge about organic farming practices, lack of sufficient good quality seed nuts/seedlings, inadequate extension support and extensive prevalence of pests and diseases (Fig. 16).

High cost of organic inputs and inadequate information about organic farming practices were considered as the most important constraint by the respondents. The reason for the high cost of organic inputs is that these materials are not subsidized by the government as in the case of inorganic (chemical) inputs. Similarly only a small percentage of farmers are using these materials in their homesteads and so the manufacturers have limited production and tagged a relatively higher price which the ordinary farmers consider costly. A possible solution is to provide subsidies for the organic inputs as in the case of inorganic inputs. A similar observation was also made by Chandrabindu *et al.* (1995), Sherief (1998), Borah *et al.* (2004) and Jaganathan (2004).

High labour charges was the second constraint reported by the respondents. Compared to the neighbouring states, the wage rate for labour is relatively higher in Kerala due to the existing socio-political situation. Non-availability of skilled labour to carry out some of the resource sustaining agricultural practices like bio-gas production, vermicomposting and coir pith composting would necessitate the farmer to pay higher than the normal rate. One way to solve this is to train the family members in activities that require skill. Similarly the farmer can look for alternatives that need less external labour in his farm.

Similar result was observed by Janadevan (1993), Sherief (1998), Balachandran (2004) and Jaganathan (2004).



C1 – High cost of inputs, C2 – High labour charges, C3 – Lack of ready package for homestead farming, C4 – Non availability of organic manure, C5 – Non availability of climbers for carrying out plant protection measures, C6 – Lack of subsidies, C7 – High transport cost of organic manures, C8 – Inadequate information about organic farming practices, C9 – Lack of credit facilities, C10 – Low premium for organic nuts, C11 – Lack of awareness and knowledge about organic farming practices, C12 – Non availability of inputs, C13 – Lack of sufficient quality seed nuts / seedlings, C14 – Inadequate extension support, C15 – Extensive prevalence of pest and diseases

Fig. 16. Constraints in the adoption of organic farming practices as perceived by coconut based homestead growers

The third constraint reported by the respondents was lack of ready package for homestead coconut farming. There should be location specific, affordable package for small holders, and it should be based on locally available inputs.

Similar result was obtained by Ranganathan *et al.* (2001) and Jaganathan (2004).

Non availability of organic inputs was the fourth constraint reported by the respondents. Production of organic inputs was being taken up by few companies. Again these firms produce organic inputs in small quantities. The effective use period (expiry date) is also short for most of the inputs. Existing livestock possession of the respondents was also not sufficient to produce adequate amount of organic inputs. It is the responsibility of government to come forward to produce organic inputs and popularize it at low cost among farmers.

Similar results were reported by Muliyar (1989), Ranganathan *et al.* (2001) and Jaganathan (2004).

The fifth important constraint reported by the respondents was the non availability of climbers for carrying out plant protection measures. The tall nature of coconut palm makes difficult in carry out plant protection measures. In the study area pest like coconut eryophide mite are prominent. As a preventive measure climbing and application of neem based mixture is recommended. Lack of climbers prevents these operations. Government should take action to popularize and secure the climber's profession and organize the training programmes for them. It would also be help to prevent the younger generation moving away from this type of professions. Janadevan (1993) reported similar results. It is evident from the table that lack of subsidies was the sixth important constraint. As coconut is a long duration crop, farmers should be assisted through subsidies upto income generation stage. Subsidy facilities are to be extended to these farmers and they must be encouraged to use their farm based skills and



knowledge for solving the local farm problems, especially during transition period of conventional farm to organic farm, subsidy schemes are very important.

Similar result was observed by Janadevan (1993) and Sherief (1998).

High transport cost of organic manures was the seventh important constraint faced by respondents. Per palm requirement of organic manure is high, and similarly transport cost is also fairly high. In the Krishibhavans, social and agricultural societies in the panchayat level can organize and manage the delivery system. A similar finding was reported by Ranganathan *et al.* (2001).

Credit facilities are not extended to homestead coconut farmers for practicing organic farming practices as reported by the respondents as eighth constraint. This might be due to small area of the homestead and low return from this farming activity making the officials of the credit institutions apprehensive about repayment by the farmers. This could be considered while evolving government policy. Muliyar (1989), Janadevan (1993), Chandrabindu *et al.* (1995), Sherief (1998), Singh (2004), Boraha *et al.* (2004) and Jaganathan (2004) also reported a similar trend.

Low premium for organically produced nuts was the ninth constraint reported by the respondents. The reason for this is that the consumers are not yet aware of the difference in the quality of organically produced nut and the one produced by chemical methods. For this the public and consumers are to be educated on the quality of organic produce. Similarly the farmers producing such organic coconuts are to be given the 'eco-friendly labeling' certificate to get it distinguished from other products. As a policy matter, the government can procure these organic produce from the farmers and sell it at subsidized rate in the market so that consumer have a better choice to select organic coconut and coconut based products.

Similar finding was reported by Sherief (1998), Singh (2004) and Borah *et al.* (2004).

Non availability of organic inputs prevent the adoption of organic farming practices, especially composting. Vermicomposting like operations should be carried out on farm level with the assistance of government and non-governmental organizations. Eventhough schemes on those are available, the farmers are not taking advantage of it.

Similar result was obtained by Balachandran (2004) and Jaganathan (2004).

Lack of awareness and knowledge about organic farming practices was the next important constraint. Low level of training among the respondents reflects the awareness and knowledge gap about organic farming practices. Extension functionaries and scientists can interact with farmers to fill this gap. Method demonstrations, result demonstrations, video films etc. can play a major role to make them aware of these practices.

Similar finding was reported by Resmy *et al.* (2001), Singh (2004), Borah *et al.* (2004) and Balachandran (2004).

The twelfth important constraint was the lack of sufficient good quality seed nuts / seedlings. Limited production of coconut seedlings and unavailability in season was the main draw back of seedling production. Coconut Development Board should take necessary action to produce more number of seedlings during the planting season. And also establishment of more number of nurseries at regional level might be the solutions for this constraint.

The finding was in line with the finding of Muliyar (1989), Jayadevan (1993), Borah *et al.* (2004), Balachandran (2004) and Jaganathan (2004).

Inadequate extension support was the next important constraint faced by the respondents. A possible reason may be lack of sufficient extension functionaries to act as facilitators in farmer - to - farmer communication. The traditional way of transfer of technology (TOT) model does not hold good in the promotion of organic agricultural technologies among farmers. For this the agricultural extension specialist should be well acquainted with the locality, the farmers and the socio-economic as well as political interaction within the panchayat. They must be trained in participatory extension methods.

Similar observation was also made by Sherief (1998), Resmy *et al.* (2001) and Jaganathan (2004).

It is evident from the table that extensive prevalence of pests and diseases was the next important constraint. Coconut root wilt, coconut mite, black beetle, red palm weevil attack and bud rot were the prominent problems in the study area. As the produce from homestead farms are for home consumption, the farmers seldom spray chemical pesticides. So it is natural to find some pest and disease in areas where it is less polluted with chemicals. One way to combat this problem is group action of the farmers. Resorting to various biological methods of controlling, the farmers as group, would be able to eradicate the pest or disease problem as a whole in that area. The support of extension system and government policy for group action would be necessary for tackling this problem.

Similar result was observed by Muliya (1989), Prakash (1989), Jayasankar (1988), Sherief (1998), Balachandran (2004) and Jaganathan (2004).

Inadequate information about organic farming was the next important constraint reported by the respondents. Most of the current researchers are heavily biased towards modern agricultural technologies. These technologies are not touching the poor farmers real condition of farming. They are lacking in cost benefit wise information. For developing location specific and economically

viable technologies, farmers should be involved closely in the research design and implementation as they know their local conditions better and the type of intervention required. The findings of this study confirms to the earlier findings of Sherief (1998), Resmy *et al.* (2001) and Jaganathan (2004).

### **Suggestions for overcoming the constraints**

According the review of relevant literature, discussion with experts of Kerala Agricultural University, experience gathered from the survey and interacted with coconut based homestead farmers, following suggestions are put forwarded by the researcher for overcoming those constraints.

- Creating awareness among the farmers about the special benefits of organic farming.
- Development of model organic plots with institutional support
- There should be special encouragement for organic products by way of adequate premium price incentives.
- Incentives are necessary in the initial years for farmers interested in converting conventional farms to organic farms in phased manner.
- Promoting cropping system approach with the inclusion of comparable crops, animal husbandry, poultry and fisheries depending on the locality and facilities.
- Assuring availability of quality organic manures at reasonable prices.
- Introduction of vermicomposting and coir pith composting units at field level.

- ❑ Promotion of biofertilizers, biopesticides and recycling of wastes as ecofriendly inputs in coconut plantations.
- ❑ Conducting training programmes at regional level on vermicomposting, coir pith composting and use of biofertilizers for coconut.
- ❑ Financial support through credit facilities from government and private sector banks.
- ❑ Introduction of subsidy schemes on organic farming at different stages for coconut cultivation.
- ❑ Financial support during transition
- ❑ Supportive role of the government in marketing, subsidies and loans.
- ❑ Alternative market for organic coconut and its products with no interaction of middleman.
- ❑ Assurance of better prices for organic coconut and its products.
- ❑ More attention in international market especially for tender nut production as beverage.
- ❑ Creation of networks of organic farmers to facilitate exchange of ideas, technology, inputs and experience.
- ❑ Setting up a national certification scheme and accreditation agency to certify organic coconut and its products in the country.

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## SUMMARY

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## 5. SUMMARY

The intensive chemical agriculture that has been followed after the success of green revolution is causing heavy pollution of our food, drinking water, air, degradation of soil fertility and chain of human health hazards. The rural economy is in ruins because of over dependence of outside agricultural inputs such as seed, fertilizers, pesticides, growth promoting chemicals etc. rather than on-farm inputs.

Organic agriculture responds positively to all sustainable agriculture and rural development objectives and helps in maintaining soil fertility, improve crop production and socio-economic conditions of the farmers. Organic farming is an age old practice of natural farming which avoids use of chemical fertilizers and pesticides.

Coconut is one of the most important plantation crops grown in Kerala, and it plays a very unique role in the socio-economic development of the state. The most predominant characteristic of Kerala is the coconut based homesteads where coconut palm is considered as the major crop. Coconut in Kerala is essentially a crop of small and marginal farmers. The average size of holding is only 0.2 ha. Most of the coconut production comes from small and marginal farmers.

Enormous potential exist for organic agriculture in coconut based homesteads due to the availability of large quantities of biomass in homestead itself. In increasing trend in the world agricultural market is more concern about the quality of the produce and health-wise security. Hence, demand for organic coconut as well as organic tender nuts as natural beverage is increasing rapidly.

So promotion and popularization of organic agriculture among coconut based homestead farmers are the need of the hour.

Keeping in this view this research project was taken up with the following objectives.

- To study the profile characteristics of coconut based homestead farmers
- To study the extent of awareness about organic farming practices in coconut based homesteads.
- To find out the extent of knowledge about organic farming in coconut cultivation.
- To study the attitude towards organic farming practices.
- To study the extent of adoption of organic farming practices.
- To study the constraints faced by the farmers in the adoption of organic farming practices.

The study was conducted in the randomly selected panchayats of Kalliyoor, Venganoor and Kizhumilum of Nemom, Adiyanoor and Chirayinkeezh blocks, respectively of Thiruvananthapuram district in Kerala, India. Multistage random sampling technique was administered to select 105 coconut based homestead growers from the study area.

An explorative methodology was employed to identify the organic farming practices for the study. For this an extensive review literature was carried out and 30 organic farming practices were identified. Forty scientists representing different disciplines in agriculture were selected for judging the relevance of the



30 organic farming practices in coconut cultivation. Based on their rating, 20 organic farming practices were finally selected.

Eleven independent variables were selected based on judges relevancy rating which included age, experience in coconut cultivation, education, livestock possession, training attended, innovativeness, self confidence, market perception, environmental orientation, risk orientation and information seeking behaviour. All these variables were quantified with the help of available measurement procedures. The selected dependent variables for the study were awareness, knowledge, attitude and adoption. These variables were quantified using measurement devices available, modified for the study. The relationship between the dependent variables and independent variables was studied using correlation analysis. Constraints in the adoption of organic farming practices were also recorded as perceived by the coconut based homestead growers.

The data were collected using a pre-tested structured interview schedule prepared for the study and non participant observation technique. Different statistical tools like mean, percentage analysis and correlation were used to analyse the data.

The salient findings are presented below.

#### 5.1. PROFILE CHARACTERISTICS OF THE COCONUT BASED HOMESTEAD FARMERS

- (i) Majority of the coconut based homestead farmers (84%) belonged to old age category
- (ii) Most of the coconut based homestead farmers (42%) had primary school education.
- (iii) Thirty eight per cent of the respondents were having more than 25 years of experience in coconut cultivation.



- (iv) Nearly three fourth of the respondents had medium level of livestock possession.
- (v) Ninety seven per cent of the respondents had not attended any training followed by seven per cent only one training.
- (vi) Majority of the respondents (65%) had medium level of risk orientation.
- (vii) Almost three fourth of the respondents (71%) had medium level of self confidence
- (viii) More than half of the respondents (69%) had medium innovativeness.
- (ix) Sixty two per cent of the respondents had medium level of market perception.
- (x) More than three fourth of the respondents (83%) had medium level of environmental orientation.
- (xi) Fifty one per cent of the respondents had medium level of information seeking behaviour.

## 5.2. AWARENESS OF COCONUT BASED HOMESTEAD FAREMRS ABOUT ORGANIC FARMING PRACTICES

Majority of the coconut based homestead farmers (73%) had medium level of awareness followed by high (15%) and low levels (12%)

Organic farming practices like *in situ* incorporation of crop residues raising green manure and incorporation, mulching of the manure circle, application of poultry manure, timely irrigation, husk burial and application of farm yard manure were well known to the 70 to 94 per cent of farmers.

Practices like summer ploughing selection of nuts from organically grown palms, coir pith composting, cover cropping, biological control of pests, collection

and destruction of pests and mother palm selection, hand / mechanical weeding and use of botanical pesticides were known to the 40 to 67 per cent of farmers.

Use of traps, *in situ* vermicomposting and application of biofertilizer were known to the 39 to the 12 per cent of farmers.

### 5.3. KNOWLEDGE OF COCONUT BASED HOMESTEAD FARMERS ABOUT ORGANIC FARMING PRACTICES

Sixty eight per cent of the coconut based homestead farmers had medium level of knowledge followed by high (21%) and low (11%) levels of knowledge about organic farming practices in coconut cultivation.

### 5.4. ATTITUDE OF COCONUT BASED HOMESTEAD FARMERS TOWARDS ORGANIC FARMING PRACTICES

Majority of the coconut based homestead farmers (70%) had a favourable attitude towards organic farming practices followed by most favourable (18%) and less favourable (12%) attitude.

### 5.5. ADOPTION OF ORGANIC FARMING PRACTICES BY THE COCONUT BASED HOMESTEAD FARMERS

Most of the respondents (60%) belonged to medium level of adoption of organic farming practices followed by low (26%) and high levels (14%).

#### 5.5.1. Practice-wise extent of adoption

Organic farming practices like summer ploughing, raising green manure and incorporation, *in situ* incorporation of crop residues, husk burial and mulching the manure circle were adopted by 30 to 49 per cent of the coconut based homestead farmers.

Practices like timely irrigation, application of farm yard manure, application of poultry manure, hand / mechanical weeding and intercropping were adopted by 20 to 29 per cent of the coconut based homestead farmers.

Practices like coir pith composting, mother palm selection, resistant/tolerant variety and cover cropping were adopted by 10 to 12 per cent of the coconut based homestead farmers.

Only two to nine per cent of the farmers were adopting practices like application of biofertilizer, use of botanical pesticides, selection of nuts from organically grown palms, *in situ* vermicomposting, application of oil cakes and use of traps.

#### **5.5.2. Application of inorganic and organic fertilizer among the coconut based homestead farmers**

Majority of the coconut based homestead farmers (65%) applied inorganic fertilizer for coconut cultivation. Neither inorganic nor organic fertilizer applied by the 29 per cent of respondents and six per cent of the respondents applied only organic fertilizers.

#### **5.6. RELATIONSHIP BETWEEN THE CHARACTERISTICS OF THE COCONUT BASED HOMESTEAD FARMERS WITH THE EXTENT OF AWARENESS, KNOWLEDGE, ATTITUDE AND ADOPTION**

Out of the eleven variables studied, education, innovativeness, risk orientation, market perception, self confidence and information seeking behaviour showed significant and positive relationship with awareness.

Knowledge of coconut based homestead farmers about organic farming practices had significant and positive relationship with education, innovativeness, risk orientation, market perception, self confidence, information seeking behaviour and awareness.

Nine variables namely, education, livestock possession, innovativeness, risk orientation, market perception, self confidence, information seeking behaviour, awareness and knowledge showed a significant and positive relationship with attitude towards organic farming practices.

Adoption of the organic farming practices had significant and positive relationship with nine variables namely, education, innovativeness, risk orientation, market perception, self confidence, information seeking behaviour, awareness, knowledge and attitude.

#### 5.8. CONSTRAINTS IN THE ADOPTION OF ORGANIC FARMING PRACTICES AS PERCEIVED BY THE COCONUT BASED HOMESTED FARMERS

It was observed that the most important constraint experienced by coconut based homestead farmers was the high cost of organic inputs, than the other constraints. The order of importance were high labour charge, lack of ready package for homestead farming, non-availability of organic inputs, non-availability of climbers for carrying out plant protection measures, high transport cost of organic manure, lack of subsidies, inadequate information about organic farming practices, lack of credit facilities, low premium for organic nuts, non-availability of inputs, lack of awareness and knowledge about organic farming practices, lack of sufficient good quality seed nuts/seedlings, inadequate extension support, extensive prevalence of pests and diseases.

#### **Implications of the study**

It is evident from the study that productivity and sustainability goals had to be attained in organic coconut cultivation. For this, introduction of special package for coconut based homesteads giving priority for the coconut palm could be recommended in specific locations and according to the organic input source

availability of the area. Then farmers would have an option to choose those practices that suit their farming needs and priorities,

Identification of organic farming practices separately according to their economic viability specially cost benefit ratio is very important for further adoption.

According to the study it is clear that majority of the respondents had not attended even one training programme during last three years. Hence it is essential to provide sufficient opportunities to the farmers for more training on organic farming. Training institutions, NGOs and extension functionaries (specially Coconut Development Board and related organizations) who are in constant contact with farming community need to take into account the profile characteristics of the coconut based homestead growers, while planning and executing the agricultural development programmes. Because these characteristics were found to influence their adoption of organic farming practices.

The study reveals that awareness of the respondents on organic farming practices is medium, awareness is largely contributes to the adoption process. It is essential to provide first-hand and latest information on organic farming practices on coconut, it's benefit and field level success to the farmers continuously. In this regard mass media can play a vital role, as it could address and reach large number of clients with the short period of time. Publication of feature articles in leading dailies and magazines, success stories of coconut farmers, short duration video films on different organic farming practices, weekly discussions and quiz programmes through radio and television would create greater awareness. Scientists can participate in these to increase the credibility of the programmes.

In the study area knowledge of the coconut based homestead farmers on organic farming was found to be medium. It is essential fact that the widening the knowledge on organic farming among the farmers, as knowledge shows significant and positive relationship with adoption. In knowledge development process farmers/producers, and consumers should be targeted when planning the knowledge widening programmes. Government departments, Coconut Development Board, Agricultural Research institutions and such regulatory bodies would help in spreading of organic farming.

Attitude is very important for successful adoption of any innovation. In this regard mass media specially Television, radio and newspapers can play a vital role. Frequent reinforcement of ideas through these would create favourable attitude towards organic farming practices.

Adoption of organic farming practices by coconut based homestead farmers was found to be medium and low. As “seeing is believing”, result demonstrations, model farms, field days, crop clinics, video films etc. can be effectively used to reinforce effectively their interest by viewing tangible evidence. As the results of the study is emphasizing the need of training. Training is very important for the adoption and then farmer would try organic farming practices in their field. New strategies like Farmer Field School (FFS), farmer level research and development, participatory research with farmers, establishment of knowledge development centres, Information KIOSKS on organic farming, would be give immense back up for adoption. Subsidies, financial support, credit facilities during transition period are also very important. Strengthening in the marketing facilities, protection of farmer from middle man, value addition on coconut and product diversification would help farmer for more adoption. While formulating policies and plans, authorities should identify the real farming situation and all the recommendations, should touch the farmers need. In this Coconut Development Board can act as a mediator between researcher and extension personnel. Coconut Development Board should be

responsible for information, extension activities, input supply and marketing. Those all the services should be under one umbrella.

Organic farming in coconut is a viable alternative in the present scenario, as coconut based homesteads are multi resource units which are common in Kerala. Coconut palm itself produces huge amount of biomass within the system. So without depending on out-farm inputs, it can be easily practiced the organic farming in coconut based homesteads. It will protect our soil, environment and natural predators at the sametime increase the quality of product and healthwise security. The export potential of organic coconut is a short-term reward, but restoration of environmental health is the long term reward. This is important for all aspects of life of the people. Strengthening the research extension linkage on organic farming in coconut, facilitation of input supply, development of market channels, product diversification, strengthening the organic tender nut production as beverage for international market are needed to facilitate the successful adoption of organic farming practices by coconut growers.

### **Suggestions for future research**

1. For generalization of findings, similar studies could be conducted in other districts also as the present study was confined to only one district.
2. In depth studies may be conducted for individual organic farming practices which relate to coconut to analyse and find out the feasibility and practicability of those practices.
3. Extension strategies of Government and non-government organizations for promotion of organic farming practices may be studied for their impact.



4. A multidisciplinary research team must explore the prospects of organic farming practices in coconut cultivation as this is one of the major component, in sustainable agriculture.
5. More research and studies should be targeted on low cost on-farm biomass utilization and soil fertility management practices.
6. More studies on soil fertility management aspects of coconut gardens should be carried out.
7. Content analysis of messages related to organic farming practices through print media and programmes in radio and television may be studied.
8. Perception of extension functionaries and scientists on the appropriateness of organic farming practices in coconut cultivation may be studied.
9. The direct and indirect effects of organic farming on a long term basis need to be quantified.
10. More effective ways of converting organic biowastes into ecofriendly organic manures, with least pollution are to be evolved.

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## APPENDICES

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## Appendix – I

### SELECTION OF THE VARIABLES FOR THE STUDY

KERALA AGRICULTURAL UNIVERSITY  
DEPARTMENT OF AGRICULTURAL EXTENSION  
COLLEGE OF AGRICULTURE  
VELLAYANI (695522), THIRUVANANTHAPURAM

From :

Dr. A.K. Sh̄rief,  
Assistant Professor (S.S.),  
Dept. of Agricultural Extension,  
College of Agriculture,  
Vellayani, Thiruvananthapuram – 695 522.

Sir/Madam,

Subject: M.Sc. (Agri) – Agricultural Extension students Research variables selection – Judges Opinion requested.

I am pleased to inform you that Mr. J.K.J.P. Jayawardana, Post graduate student of Department of Agricultural Extension, College of Agriculture, and Vellayani has taken up the research study entitled “Organic Agricultural Practices in Coconut homesteads in Thiruvananthapuram district for his thesis programme.

Objectives of his study is to promotion of organic agricultural practices in coconut homesteads for which the profile characteristics, of homesteads coconut farmers, awareness, knowledge, attitude, adoption and constraints towards organic farming will be studied. In order to know the relevancy of the variables mentioned in those categories he seeks your expert guidance.

Hence I request you to kindly spare your valuable time to rate the relevancy of the variables by making a tick (✓) mark on the three point continuum and kindly send the same to the student researcher.

Thanking you,

Yours sincerely,

04/10/2006

A.K. Sherief.

### Dependent variables

- Extent of awareness about organic agricultural practices.
- Extent of knowledge about organic agricultural practices.
- Attitude towards organic agricultural practices
- Extent of Adoption of organic agricultural practices.

### Independent variables

VARIABLES	RELAVENT	LESS RELAVENT	NOT RELAVENT
<b>Age:</b> Number of years the respondent has actually completed at the time of interview			
<b>Education:</b> Extent of formal education acquired by the respondent			
<b>Experience in Coconut cultivation:</b> Total number of years the respondent has been engaged in homestead coconut cultivation.			
<b>Area under homestead coconut:</b> Extent of area under homestead cultivation in cents			
<b>Livestock possession:</b> Number of animal possessed by an individual.			
<b>Mass media exposure:</b> Degree to which the different mass media namely, radio, television, newspaper, magazines, bulletins, books and films where utilized by the farmers for getting information about different organic agriculture practices in coconut homesteads.			
<b>Extension orientation:</b> Extent of contact the farmer has with different extension agencies and also his participation in union activities or programmes like meetings , seminars etc.			
<b>Economic motivation:</b> Extent to which is oriented towards profit maximization and relative value he places one monetary gains.			

<b>Training attended:</b> Number of trainings in various organic farming activities undergone by the respondent during last three years.			
<b>Innovativeness:</b> Degree to which the respondent was relatively earlier in adopting new ideas.			
<b>Risk orientation:</b> Degree to which the farmer is oriented towards encountering risks and uncertainty in adopting organic farming practices and he exhibits courage to face problems of risk.			
<b>Market perception:</b> Capacity of the respondent to identify the market trend to sell the produce for greater returns.			
<b>Self confidence:</b> Extent of feeling about one's own powers, abilities and resourcefulness to perform any activity which the farmer desire to undertake.			
<b>Annual income:</b> Total earning of all the members of the family of the respondent for one year.			
<b>Cosmopolitaness:</b> Tendency of the farmers to be contact with outside village on belief that all the needs of an individual cannot be satisfied within his own village.			
<b>Achievement motivation:</b> Striving of farmers to do good work and attain a sense of an accomplishment.			
<b>Main occupation:</b> Main vocation from which the farmers derives major share of income.			
<b>Risk preference:</b> Positive or negative effects or feelings towards risk held by a farmer towards farming in general.			
<b>Scientific orientation:</b> Degree to which a farmer is relatively ready to adopt scientific ideas.			
<b>Progressiveness:</b> Extend to which one is relatively early in venturing or putting the the innovation to practice.			

<b>Family labour utilization:</b> Extent of utilization of members of the family by respondents for farming activities.			
<b>Management orientation:</b> Degree to which the respondent is scientifically oriented towards planning, production and marketing aspects of the farming.			
<b>Information utilization:</b> An individual contact with various sources of information			
<b>Social participation:</b> Degree of involvement of respondents in formal and informal social organizations either as a member or as an office bearer which also includes the extent of participation in organizational activities.			
<b>Environmental orientation:</b> Degree to which a farmer is concerned about his environment			

If any other variables, please mention.

Signature:

Name:

Designation:

**Appendix – II****SELECTION OF ORGANIC FARMING PRACTICES FOR THE STUDY**

Dr. A. K. Sherief  
Assistant Professor  
Dept. of Agricultural Extension,  
College of Agriculture,  
Vellayani, Thiruvananthapuram – 695 522.

Sir/Madam,

Sub: P.G Education – Thesis research project Judges opinion requested – regarding

One of my P.G students Mr. J.K.J.P Jayawardana has taken up his research project entitled “Organic agricultural practices in coconut based homesteads in Thiruvananthapuram district” for his M.Sc. (Ag.) programme.

The objective is promotion of organic farming practices in coconut farming in coconut based homesteads, for which the awareness, knowledge, attitude and adoption of organic farming practices by homesteads farmers will be studied.

For this purpose the student has listed out a number of organic farming practices in coconut based homesteads. As you may be aware all may not be equal contributions for organic farming practices. So the list of practices are to be rated in a three point continuum such as most important, important and least important.

With your past experience and experience in coconut based homestead farming, I consider that you, Sir/ Madam will be most appropriate judge to give the opinion about organic farming practices. I request you to kindly spare a few minutes in rating the practices, I look forward to your encouragement in my student research.

Thanking you,

Yours sincerely,

A.K. Sherief

## SELECTION OF ORGANIC FARMING PRACTICES FOR THE STUDY

Please put a tick (✓) mark in the appropriate column against each practice keeping in view the possible contribution of each practice towards organic farming practices in coconut based homestead coconut cultivation

Sl. No.	Organic farming practice	Most important	Important	Least important	Mean value
1	Summer ploughing				2.10*
2	<i>In situ</i> incorporation of crop residues				2.86*
3	Raising green manure and incorporation				2.73*
4	Season				1.95
5	Mother palm selection				2.20*
6	Selection of nuts from organically grown palms				2.56*
7	Resistant / Tolerant variety				2.43*
8	Correct depth of planting				1.98
9	Timely irrigation				2.33*
10	Husk burial				2.16*
11	Mulching the manure circle				2.26*
12	<i>In situ</i> vermicomposting				2.50*
13	Coir pith composting				2.40*
14	Application of oil cakes				2.03*
15	Monitoring of pest and diseases				1.97
16	Introduction of biological agents				1.96
17	Application of farm yard manure				2.93*
18	Application of poultry manure				2.10*
19	Conservation of natural enemies				1.97
20	Ash / cow dung slurry				1.95
21	Intercropping				2.50*
22	Application of biofertilizer				2.20*
23	Use of light traps				
24	Use of pheromone traps				2.0*
25	Hand / mechanical weeding				2.03*
26	Use of botanical pesticides				2.0*
27	Cover cropping				2.30*
28	Irrigation at critical stages				1.85
29	Application of wood ash				1.85
30	Soil banding and terracing				1.78



## Appendix – III

## INTERVIEW SCHEDULE

Organic agricultural practices in coconut based homesteads in Thiruvananthapuram district

Date :  
 Block :  
 Panchayat :  
 Ward :  
 Respondent No :

1. Name of the respondent :
2. Address :
3. Age in completed years :
4. Experience in coconut cultivation (No of years) :
5. Experience in organic farming
6. Education :

Category	
Illiterate	
Primary School	
Secondary School	
Collegiate	

## 7. Livestock Possession :

Sl. No.	Category	No	Value (Rs)
1.	Buffalo		
2.	Bullock		
3.	Cow		
4.	Calf		
5.	Goat		
6.	Poultry		
7.	Others please Specify		

**8. Training Attended :**

Name of the training programme	Organization which imparted	Duration of training	Number of times attended	Remarks

**9. Innovativeness :**

When would you like to adopt an organic farming practice

1. As soon as it is brought to my knowledge
2. After I have seen some other farmers using it successfully in their farms.
3. I prefer to wait and take my own time.
4. I am not interested in adopting organic farming practice

**10. Risk Orientation :**

Sl.No	Statements	SA	A	UD	DA	SDA
1	A farmer should grow a large number of crops to avoid greater risks involved in growing one or two crops					
2.	A farmer should take more chance in making a big profit than to be content with smaller but less risky profit					
3.	A farmer who is willing to take greater risk than the average farmer usually does better financially					
4.	It is good for a farmer to take risk when he knows his chance of success is fairly high					
5.	It is better for a farmer not to follow organic farming practices unless most others in the locality have used it with success					
6.	Trying an entirely organic farming practices by a farmer involves risk but it is worth					

**11. Market Perception :**

Please record your response based on your perception with regard to marketing your produce.

- a. Do you think a farmer will be able to sell coconut at a higher demand if he increases the quality by adopting organic farming practices?  
(Yes / No)
- b. How much price the produce of the crop cultivated following organic farming will fetch compared to those raised under conventional method?  
(Low / Same / High)
- c. How difficult will it be to dispose off the produce of the crop cultivated following organic farming practices?  
(Very difficult / Difficult / Easy / Very Easy)

### 12. Self Confidence :

Sl. No	Statements	Always	Most often	Often	Occasionally	Never
1	I feel no obstacle can stop me from achieving my final goals					
2.	I am generally confident in whatever I do					
3.	I am bothered by the feelings that I can not compare with others					
4.	I am not interested to do things at my own initiate					
5.	I Usually workout things for myself rather than get some one to show					
6.	I get encourage easily					
7.	Life is a struggle for me most of the time					
8.	I find myself worrying about something or the other					

### 13. Environmental Orientation :

Sl. No.	Statements	Agree	Disagree
1	Indiscriminate use of pesticides cause environmental hazards		
2.	Man is exploiting the earth to much		
3.	Man has to be greatly concerned about environment issues like soil pollution, water pollution etc.		
4.	There is truth what environmental activities claim and we should lend our support to them		
5.	The present trend is to reduce the use of chemical control measures, Now do you agree that older methods of farming were more safer than the present ones		
6.	Agricultural produce obtained without use of chemicals, are more tastier and healthier		

#### 14. Information Seeking behaviour :

To what extent do you make use of following information sources regarding advice for coconut cultivation. Please tick (✓) in appropriate column.

Sl.No.	Source	Always (2)	Sometimes (1)	Never (0)
1.	Dy. Director/ Principal Agricultural officer			
2.	Agricultural officer			
3.	Agricultural Assistant			
4.	Agricultural Scientist			
5.	Fertilizer Agent			
6.	Relatives			
7.	Newspaper			
8.	Radio			
9.	Television			
10.	Agricultural Publications			
11.	Fellow growers			
12.	Others, Please specify			

#### 15. Awareness of farmers about organic farming practices in coconut cultivation

Sl. No.	Practice	Are you aware		
		Aware	Partially Aware	Not Aware
1.	Mother palm selection			
2.	Selection of nuts from organically grown plams			
3.	<i>In situ</i> incorporation of crop residues			
4.	Raising green manure and incorporation			
5.	Cover cropping			
6.	Timely Irrigation			
7.	Husk burial			
8.	Mulching the manure circle			
9.	<i>In situ</i> vermicomposting			
10.	Coir pith composting			
11.	Application of farm yard manure			
12.	Application of Poultry manure			
13.	Intercropping			
14.	Biological control of pests			

15	Use of Botanical pesticides (Neem)			
16	Summer ploughing			
17.	Hand/ Mechanical weeding			
18	Collection and destruction of pests			
19	Application of biofertilizer			
20	Red weevil pheromone traps			

### 16. Knowledge of farmers about organic farming practices in coconut cultivation

- (1) Advantage of mother palm selection is
  - (a) To get the maximum yield
  - (b) Regular bearing
  - (c) Resistant to pest & diseases
  - (d) All of the above
- (2) Benefit of selecting quality nuts
  - (a) Early germination
  - (b) Vigorous in growth
  - (c) Non of above
- (3) Which one is the following is cover crop
  - (a) Calapagonium
  - (b) Mimosa
  - (c) Non of above
- (4) Which one is the following come under green manure
  - (a) Glyricidia
  - (b) Sunhemp
  - (c) a and b
- (5) Selection of resistant varieties is a better method than treating the pest/disease infested crops (True/ False)
- (6) Husk Burial is a desirable practice practically for moisture retention (True/False)
- (7) Mulching is done to
  - (a) conserve soil moisture
  - (b) Reduce weed growth
  - (c) Improve soil fertility
  - (d) All of the above
- (8) Vermicomposting improve soil health (True/ False)
- (9) Name two natural enemies
- (10) Name two Botanicals used for pest and disease control
- (11) Organic manures supply
  - (a) Only N, p and K
  - (b) Only ca, Mg and S
  - (c) All Nutrients
  - (d) Non of the above

(12) Which one of the following is called nature's plough

- (a) Butterfly
- (b) Earth worm
- (c) Honeybee
- (d) Non of the above

(13) Advantage of crop rotation with legume is

- (a) To fix atmospheric Nitrogen
- (b) To fix atmospheric oxygen
- (c) To fix atmospheric Carbon dioxide
- (d) Non of the above

(14) Light traps are used to

- (a) Control of vectors of pests
- (b) Monitor population of pests
- (c) Both a and b
- (d) Non of the above

(15) How many years it will take to be converted conventional farm to organic farm

- (a) 1-2 years
- (b) 3-4 years
- (c) More than 10 years

### 17. Attitude of farmers towards organic farming practices in coconut cultivation

Sl.No.	Statements	SA	A	UD	DA	SDA
1.	Organic farming practices improves fertility status of the soil					
2.	It is worth to adopt organic farming practices even by borrowing money					
3.	Use of organic farming practices is only a waste of money and time					
4.	It is possible to get good yield by adopting organic farming practices					
5.	Adoption of organic farming is highly risky and hence it is not advisable to follow the some					
6.	Cultivation of organic coconut has brought a new light in the field of agriculture					
7.	It is better to give more importance to other occupation than following organic farming practices					
8.	Use of organic farming practices is essential for better quality of coconut					

### 18. Adoption of organic farming practices in coconut based homesteads

Sl. No.	Practice	Have you adopted		
		Adopted	Partially adopted	Not adopted
1.	Summer ploughing			
2.	<i>In situ</i> incorporation of crop residues			
3.	Raising green manure and incorporation			
4.	Mother palm selection			
5.	Selection of nuts from organically grown palms			
6.	Cover cropping			
7.	Resistant / Tolerant variety			
8.	Timely irrigation			
9.	Husk Burial			
10.	Mulching the manure circle			
11.	In situ vermicomposting			
12.	Coir pith composing			
13.	Application of Farm yard manure			
14.	Application of poultry manure			
15.	Intercropping			
16.	Application of oil cakes			
17.	Application of biofertilizer			
18.	Hand/Mechanical weeding			
19.	Use of botanical pesticides			
20.	Use of traps			

**19. Constraints in the adoption of organic farming practices in coconut cultivation**

Sl. No.	Constraints	Most important	Important	Least important	Mention your solution
1.	Lack of sufficient good quality seed nuts/ seedlings				
2.	Non availability of inputs				
3.	Extensive prevalence of pest & disease				
4.	Lack of awareness and knowledge about organic farming practices				
5.	Inadequate extension support				
6.	Inadequate information about organic farming practices				
7.	High cost of inputs				
8.	Lack of ready package for homestead coconut farming				
9.	Non availability of Climbers for carrying out plant protection				
10.	Lack of credit faculties				
11.	Lack of subsidies				
12.	High labour charge				
13.	Low premium for organic nuts				
14.	Transport cost is high				
15.	Non availability of organic manures				
16.	Others, Please specify				



**ORGANIC AGRICULTURAL PRACTICES IN  
COCONUT BASED HOMESTEADS IN  
THIRUVANANTHAPURAM DISTRICT**

**J. K. J. P. JAYAWARDANA**

**Abstract of the  
Thesis submitted in partial fulfillment of the requirement  
for the degree of**

**Master of Science in Agriculture**

**Faculty of Agriculture  
Kerala Agricultural University, Thrissur**

**2007**

**DEPARTMENT OF AGRICULTURAL EXTENSION  
COLLEGE OF AGRICULTURE  
VELLAYANI, THIRUVANANTHAPURAM - 695 522**

## ABSTRACT

The study entitled “Organic agricultural practices in coconut based homesteads in Thiruvananthapuram district” was conducted to assess the awareness, knowledge, attitude and adoption of organic farming practices, to find out the relationship between the profile characteristics and awareness, knowledge, attitude and adoption of organic farming practices and to identify the constraints in the adoption of organic farming practices and to suggest solutions to them.

The study was conducted in Kalliyoor, Venganoor and Kuzhimilum Panchayats of Nemon, Adiyanoor and Chirayinkeezh blocks respectively of Thiruvananthapuram district in Kerala. Multi stage random sampling technique was administered to select 105 coconut based homestead growers from the study area at 35 per block.

An explorative methodology was employed to identify the organic farming practices for the study. Twenty organic farming practices based on judges relevancy rating were finally selected. Eleven independent variables were selected based on judges’ relevancy rating which included age, experience in coconut cultivation, education, livestock possession, training attended, risk orientation, self confidence, innovativeness, market perception, environmental orientation and information seeking behaviour. All these variables were quantified with the help of available measurement procedures. The dependent variables selected for the study were awareness, knowledge, attitude and adoption. These variables were also quantified using available measurement devices. The relationship between the dependent variables and independent variables was studied using correlation analysis. Constraints in the adoption of organic farming practices were also recorded as perceived by the coconut based homestead farmers.

The data were collected using a pre-tested structured interview schedule prepared for the study and non-participant observation technique by the researcher. The statistical tools like mean, percentage analysis, and correlation analysis were used to analyse the data.

The salient findings are presented below.

Majority of the coconut based homestead farmers (80%) belonged to old age category. Most of the coconut based homestead farmers had (42%) primary school education. Thirty eight per cent of the respondents were having more than 25 years of experience in coconut cultivation. Nearly three fourth of the respondents had medium level of livestock possession. Ninety two per cent of the respondents had not attended any training programme followed by seven per cent undergone only one training. Majority of the respondents (66%) had medium level of risk orientation. Almost three fourth (71%) of the coconut based homestead farmers had medium level of self confidence. More than half of the respondents (69%) had medium innovativeness. Sixty two per cent of the respondents had medium level of market perception. More than three fourth of the respondents (83%) had medium level of environmental orientation. Nearly half of the respondents (51%) had medium level of information seeking behaviour.

Majority of the respondents (73%) had medium level of awareness, sixty eight per cent of the respondents had medium level of knowledge, majority of the respondents (70%) had a favourable attitude and most of the respondents (60%) belonged to medium level of adoption followed by low level (26%).

Majority of the respondents (65%) applied inorganic fertilizer for coconut and 29 per cent of the respondents applied neither organic nor inorganic. Only six per cent applied organic fertilizer for coconut.

Awareness about organic farming practices showed significant and positive relationship with education, innovativeness, risk orientation, market perception, self confidence and information seeking behaviour. Seven variables, namely education, innovativeness, risk orientation, market perception, self confidence, information seeking behaviour and awareness showed a significant and positive relationship with knowledge about organic farming practices. Attitude towards organic farming practices showed significant and positive relationship with education, livestock possession, innovativeness, risk orientation, market perception, self confidence, information seeking behaviour, awareness and knowledge. Adoption of organic farming practices was found to have significant and positive relationship with nine variables, namely, education, innovativeness, risk orientation, market perception, self confidence, information seeking behaviour, awareness, knowledge and attitude of coconut based homestead farmers.

The most important constraint perceived by the coconut based homestead farmers was the high cost of inputs. The other important constraints were high labour charge, lack of ready package for homestead coconut farming, non availability of organic inputs, non availability of climbers, lack of subsidies and credit facilities and inadequate information about organic farming practices.

Organic agriculture in coconut based homestead is a practicable and viable technique, because coconut palm itself produces huge amount of biomass within the system for recycling. It strengthens the natural resource recycling, enhances soil fertility and sustains biological production. The effort from research, extension and supply of input through government sector especially through Coconut Development Board, finding and development of international market for organic coconut and value added products, tender nut production as natural beverage are needed to facilitate successful adoption of organic farming practices by coconut growers. Hence long term and short term development plans on organic farming in coconut cultivation should be the need of hour to increase the productivity of coconut and save this "Kalpavruksha" for future generation.



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