

**FARMER SATISFACTION TOWARDS BIO-CONTROL AGENTS IN
KALADY GARMA PANCHAYAT**

173966

By

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(2011-45-110)

PROJECT REPORT

Submitted in partial fulfillment of the requirement for the degree of

Bachelor of Science (Hons.) in Co-operation and Banking

Faculty of Agriculture



**KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENT
VELLANIKKARA, THRISSUR- 680656
KERALA, INDIA**

2015

DECLARATION

DECLARATION

I hereby declare that this project report entitled “**FARMER SATISFACTION TOWARDS BIO-CONTROL AGENTS IN KALADY GRAMA PANCHAYAT**” is a bonafide record of research work done by me during the course of project work and that it has not previously formed the basis for the award to me for any degree/ diploma, associate ship, fellowship or other similar title of any other University or Society.

Vellanikkara



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CERTIFICATES

CERTIFICATE

Certified that this project report entitled “**FARMER SATISFACTION TOWARDS BIO-CONTROL AGENTS IN KALADY GRAMA PANCHAYAT**” is a record of research work done independently by Ms. SURYA DEVI.S, (2011-45-110) under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associate ship to him.



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Needless to say, I solely am responsible for any errors, which may remain.....

SURYA DEVI.S

2011-45-110

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DESIGN OF THE STUDY

CHAPTER I

Work Design

1.1 INTRODUCTION

The history of agriculture dates back thousands of years and its development has been driven and defined by greatly different climates, cultures, and technologies. However, all farming generally relies on techniques to expand and maintain the lands suitable for raising domesticated species. Organic farming is one of the several approaches found to meet the objectives of sustainable agriculture. Organic farming is gaining momentum now a day. With the increased awareness about the health hazards from many of the chemical pesticides, the demand for bio-pesticide has been steadily increasing worldwide¹. Organic farming is one of the widely used methods, which is thought of as the best alternative to avoid the ill effects of chemical pesticides.

Bio pesticides are certain types of pesticides that are derived from natural materials like plants (Botanical origin), bacteria, fungi, virus (Microbial origin) and certain minerals. The Bio Pesticides control pests / diseases either selectively or with broad spectrum approach. Bio pesticides are usually inherently less toxic than conventional pesticides. Bio pesticides are generally target specific and affect only the target pest and closely related organisms. Effective use of bio pesticides is often based on proper timing of application at the optimal population density and life stage of the target pest. Bio pesticides based on microorganisms can be effective when used at the proper time and development stage of the target pest.

Bio pesticides are very effective in the agricultural pest control without causing serious harm to ecological chain or worsening environmental pollution. The potential of bio pesticides for promoting sustainable agriculture has been known for many years². A number of government agencies, including the Ministry of Agriculture and the Department of Biotechnology, are engaged in supporting research, production and application of these agents. The demand for bio-pesticides is rising steadily in all parts of the world.

¹ http://en.wikipedia.org/wiki/Organic_farming

² Gupta and dikshit (2010). Bio pesticides: An Eco friendly Approach for Pest Management.

The research and development of practical applications in the field of bio pesticides greatly mitigate environmental pollution caused by chemical pesticide residues and promotes sustainable development of agriculture. Since the advent of bio pesticides, a large number of products have been released, several of which have already played dominant roles in the market.

The development of bio pesticides stimulates modernization of agriculture and will, without doubt, gradually replace chemical pesticides³. Many bio pesticides are ideal substitutes for their traditional chemical counterparts in pollution-free agricultural production, but some of them display certain toxicity; this should be taken into consideration by the researchers in the field. Bio pesticides represent a strong growth area in the global pesticide market.

The popularity of bio pesticides has increased substantially in recent years, as extensive and systematic research has enhanced their effectiveness. A number of research centres around the world are undertaking research aimed at improving techniques for the augmentation and application of bio pesticides, with the objective of improving the commercial feasibility of producing and using bio pesticides.

To the rapid increase in population and demand of food materials has initiated the large use of pesticide Bio pesticides are one of the best bio control methods to prevent the loss done by the chemicals⁴. In our local area many such plants, waste matter etc. are available .From which these Bio- pesticides can be prepared by using natural means only. The total world production of bio pesticides is over 3,000 tons/yr., which is increasing at a rapid rate.

1.1.1. Bio pesticides Use – An Overview

The Bio pesticides market is growing very rapidly. In 2005, bio pesticides accounted for about 2.5% of the total pesticide market, which was merely 0.2% during 2000. At present bio pesticides represent only 4.2% of the overall pesticides market in India. However, the overall growth rate of bio pesticides is estimated to be about 10% per annum for the next 5 years. In terms of use, orchards claim the largest share (55%) of the total bio pesticides used.

³ Salma mazid (7 sep 2011) Biopesticide –A safe alternative to chemical control of pest, Vol 1 .

⁴ Sinha. B, and Biswas, I. (2008, March 8). Potential of Bio pesticide in Indian Agriculture vis-à-vis Rural Development. Retrieved from <http://nistds.res.in/indiasnt2008/t6rural/t6rur17.htm>

Region wise, North America consumes the largest share (40%) of the global bio pesticides production followed by Europe and Oceanic countries accounting for 20% each .Thepotential of bio pesticides for promoting sustainable agriculture has been known for many years.

A number of government agencies, including the Ministry of Agriculture and the Department of Biotechnology, are engaged in supporting research, production and application of these agents. However, in spite of these efforts, their use in India is small. consumers demand more sustainably produced foods⁵.

In India, so far only12 types of bio pesticides have been registered under the Insecticide Act, 1968. Neem based pesticides, Bacillus thuringensis, NPV and Trichoderma are the major bio pesticides produced and used in India.

Table 1.1 Annual availability of bio pesticides in India

Bio pesticides/Bio agents	Quantity/annum (approx.)
Neem 300 PPM	1,000,000 L
Neem 1500 PPM	250,000 L
Bacillus Thuringiensis(BT)	50,000 kg
NPV (liquid)	500,000 Le
Beauveria	Meager
Pheromone traps	500,000 nos.
Lures	2 million
Trichogramma	1 million
Chrysoperla & other	Meager
Bio control insects	
Trichoderma	500 T

Source: Source: Kalra & Khanuja 2007 (Dikshit, 2010)⁶

⁵ Alam, G. (2000).A Study of Bio pesticides and Bio fertilizers in Haryana. Gatekeeper series No.SA93.

⁶ The New bio pesticide market. Business Communication Company Inc.<http://www.bccresearch.com/report/CHM029B.html>

1.1.2 Importance of Bio pesticide Use in Kerala

Government of Kerala has an ambitious plan to bring the entire state of Kerala under organic farming due to an increased awareness on ill effects of chemical pesticides and fertilizers in vegetables and fruits and the dwindling quality of soil. Today, Government various institutions ,NGO's(Non-Government Organisations), Kudumbasree etc. provided maximum support to organic farmers for the production of chemical free organic products and improving the standard of living⁷. Kerala Government has declared that by 2016 the agriculture sector in Kerala will be turned completely to organic farming. In spite of all these efforts and availability of bio pesticides in the market, farmers prefer chemical pesticides. Lack of awareness among farmers about the benefits of using bio pesticides, and harmful effects of chemical pesticides on human and animal health might lead to farmer preference of chemical pesticides over bio pesticides. Farmers and the rest of society are optimistic about a change in farming methods but they doubt whether a total shift to organic farming in a short span is viable⁸.

In this context it is appropriate to study the farmer behaviour towards bio pesticides as the government is giving more emphasis on organic farming and many of the farmers are still unaware of the various bio pesticides prevalent in market.

1.2 STATEMENT OF PROBLEM

Realizing the harmful effects of chemical pesticides, Government of Kerala has made it a policy to promote the use of bio pesticides. Government of Kerala has declared that by 2016 the agriculture sector in Kerala will be turned completely to organic farming. Farmers are still using chemical pesticides in their farm lands. This is mainly because of the lack of awareness among farmers about the benefits of using bio pesticides and harmful effects of chemical pesticides on human and animal health. The farmers are not interested to use the bio pesticides during the cultivation, since it requires mass management practices. So a study regarding farmer behaviour towards bio pesticides will be helpful for Government to implement the policy successively through the local self-governments.

⁷ Karla, A & Khanuja,SPS, (2007). Research and Development priorities for bio pesticide and bio fertilizer products for sustainable agriculture in India.In. Business potential for Agricultural Biotechnology (Edited by Teng PS). Asian Productivity Organisation.Pp: 96-102

⁸ Kumar, K.P. 2015, Mar. 13. Bing bang organic plan on loose soil. Deccan Chronicle. p2

1.3 OBJECTIVES OF STUDY

- To study the level of awareness of farmers towards various bio-control agents available in the market.
- To analyse the buying behaviour of farmers towards bio-control agents.
- To identify the major challenges for adoption of bio-control agents.

1.4. METHODOLOGY OF THE STUDY

1.4.1 Location of the study

The study located at Kalady Panchayat of Ernakulum district

1.4.2. Sample Selection

The study was confined to the bio-control agents. Samples of 30 farmers who are cultivating Elephant foot yam, paddy, vegetables or banana were selected from Kalady Panchayat of Ernakulum district in Kerala state by using purposive sampling.

1.4.3 Data Collection and Analysis

Both primary and secondary data were used for making this study. The primary data collected from the users of the bio-control agents from Kalady Grama panchayat of Ernakulum district by administering pre-structured survey schedules. The secondary data collected from published sources such as reports, journals, internet and other media. The collected data were classified, tabulated and analysed by appropriate statistical tools.

1.4.4 Analytical tools used

1. Percentage analysis

For analysing socio-economic variables percentage analysis was used.

2. Attitude index

For measuring the interest among farmers in the adoption of bio pesticides, attitude index was used. For the construction of indices the respondents were assigned the marks of 5,4,3,2, and 1 representing the most positive degree of opinion to most negative degree of opinion.

Table 1.2 Range for calculation of attitude index

Degree of Opinion	Scores
Highly Favourable	5
Favourable	4
Neither Favourable nor Unfavourable	3
Unfavourable	2
Highly Unfavourable	1

The scores of all the respondents for each attribute were summed up to arrive the total score. The total score thus obtained by each attribute was then divided by the maximum possible score for that attribute to obtain the attitude index of that attribute.

Farmer attitude index = Total score for each attribute/ Maximum score for that attribute *100

The indices of the attributes were then averaged to get the overall attitude index.

3. Satisfaction Index

- There is a five-point scale in the questionnaire based on which the farmer responses range from Highly Satisfied, Satisfied, No Opinion, Dissatisfied, Highly Dissatisfied.

- **Table 1.3 Scores for calculation of satisfaction index**

Scale	Score
Highly Satisfied	5
Satisfied	4
No Opinion	3
Dissatisfied	2
Highly Dissatisfied	1

- Total Score Received = (total number of responses of 5 * 5)+(total number of responses of 4 * 4)+(total number of responses of 3 * 3)+(total number of responses of 2 * 2)+(total number of responses of 1 * 1)

- Satisfaction Index = Total Score Received / Maximum Total Score * 100

Based on Satisfaction Index value the total satisfied farmers are divided into five categories viz, highly dissatisfied farmers (SI Value ≤ 30), dissatisfied farmers, (SI Value >30 but ≤ 50), Farmers having no opinion (SI Value >50 but ≤ 70), satisfied farmers (SI Value > 70 but ≤ 90) and highly satisfied farmers (SI Value >90).

1.4.5 OBSERVATIONS MADE

- Socio-Economic profile of the farmers
- Awareness level of farmers towards bio-control agents
- Buying behaviour of farmers towards bio-control agents
- Attitude of farmers towards bio-control agents
- Barriers in adoption of bio-control agents
- Level of farmer satisfaction on the use of bio-control agents
- Cost factor

1.5 SCOPE OF SYUDY

The scope of study will be limited to the farmers in Kalady Grama Panchayat of Ernakulum district and their satisfaction towards bio-control agents. The study helps to know much about the trend of farmer satisfaction towards bio-control agents.

1.6 LIMITATION OF THE STUDY

- Due to the time constraint, the study was limited only to Kalady Garamapanchayat, hence the findings cannot be generalized.
- Collecting information through limited number of samples might not rightly represent the whole population.

1.7 CHAPTERISATION

The study is presented in four chapters. The first chapter is devoted to Design of the study which includes introduction, statement of the problem, objectives, Methodology, Scope of study, Limitation of study and Review of Literature.

Second chapter contains the study area. The study located at Kalady Panchayat of Ernakulum district. Third chapter deals with analysis of the survey and finally the fourth chapter outlines the summary, findings and conclusion.

REVIEW OF LITERATURE

Kumar(2015)News in business line reveals that Food deficient Kerala, in exceedingly worried over the high doses of chemical contamination in its food supplies, is stepping up its guard against pesticides residue in vegetables & fruits coming from other states .Vegetable contamination is a very serious issue as it causes serious health risks. The state government is putting in place measures to lower the level of pesticides including a proposal to carryout field inspections to create awareness among farmers.

Kandpal (2014) in the journal stated Bio-pesticides are eco-friendly pesticides which are obtained from naturally occurring substances (biochemical), microbes and plants. Notall natural products are bio pesticides. Some are chemical pesticides if they act on nervous system of the pest. Through the use of bio pesticides in a wider way, agriculture and health programmes can be beneficially affected. The total world production of bio pesticides is over 3,000tons/yr., which is increasing at a rapid rate. India has a vast potential for bio pesticides. However, its adoption by farmers in India has to be motivated for maximizing gains.

Kumar and Singh (2014) conducted a study on the Bio pesticides for integrated crop management. The study result revealed that bio pesticides may be less vulnerable to genetic variations in plant populations that cause problems related to pesticide resistance. Mostly their use is not overly complicated. However application of some bio-pesticides may require training and knowledge of pests / pathogens against which they can be used successfully.

Agarwal (2013) in the article suggest that the country have a vast potential for adoption of organic agriculture as it is endowed with a wide variety of organic source of nutrients, wide diversity in climate. For converting chemical agriculture to organic agriculture, the approach should be tapering off the use of chemical &then gradually to completely organic. The government provide adequate subsidy to the farmers adopting organic.

Agro Bio pesticide(2013) in the journal stated The bio pesticides sector is estimated to be worth around \$1.5billion per annum, with an annual growth rate expected to soon reach 15%.Biopesticides are attracting leacuitiRD based companies. The largest regional market for bio pesticides isNorthAmerica, ,withanumberofrecenthighpro! accounting for around 40% of sales. Europe, Asia and Latin America, represent 25%, 20% and 10%, respectively.

Bharddwaj and Sharma (2013) conducted a study on the Impact of pesticides application in agricultural industry in India. The study explored that the application of chemical pesticides in India dates back to 1948 while the production started in 1952 with the establishment of manufacturing plant of DDT&BHC near Calcutta. The study found that only 0.1% of pesticide application targets the pest and the rest 99.9% remain and seep in environment.

Katti (2013) conducted a study on the Bio pesticides for Insect Pest Management in Rice – Present Status and Future Scope. Paddy ecosystems are richly endowed with natural regulatory mechanisms to take care of the insect pests and entomopathogens are one of the major groups among the natural enemies. Pest control methods have been evolving and diversifying in response to public awareness of environmental and health impacts of synthetic pesticides and resulting legislation. In the recent years, there has been aspart in efforts to develop organic pestmanagement methods in view of the stronginfluence and growth of the organic foodsmarket in the developed countries andbiopesticides does find a place in this context.

Quarles (2013) in the article stated Bio pesticides do not pose the same regulatory problems seen with chemical pesticides. They are often target-specific, benign to beneficial insects; do not pose air or water quality problems, and crops can bereentered soon after treatment. Naturally occurring microbial can be used in organic production, andhuman health risks are low. Bio pesticides provide an alternative to conventional pesticides in IPM programs, and many formulations have been approved for organic production.

Upadhyay (2013) conducted a study on the Nuclear Polyhedrosis Virus (NPV), A Potential Bio pesticide .Npv being one of the important bio pesticide, as it is ecofriendly, having less residual toxicity, compatible with many chemical pesticides, self-perpetuating nature. A staining method for counting the polyhedral in NPV cans beused a quality control test for NPV. In the case of fungal, pathogens, if the virulence has to be retained, it is necessary to periodically pass through the host culture. For quality control of Bt formulations, diet-incorporation method was generally used, which was made simpler.

Badhe (2012) in his study named Constraints faced by the farmers in bio pesticides application in Anand district of Gujarat state. The result of the study depicted that major constraints faced by farmers in application of bio pesticides are lack of awareness about different bio pesticides, non-availability of quality bio pesticides and lack of field demonstrations on bio pesticides.

Kumar (2012) in his study named Need for Food and Environmental Safety. One of the promising alternatives has been the use of bio pesticides. They can replace, at least in part, some hazardous chemical pesticides when incorporated into integrated crop management technology. Although potential and scope of bio pesticides and bio fertilizers for promoting sustainable agriculture has been known for years, organic farming has emerged now in view of the growing demands for the safe and healthy food, and concerns on environmental pollution.

Shafiq (2012) conducted a study on the Potential of Biopesticides in Sustainable Agriculture: In Environmental Protection strategies for Sustainable Development Crop protection has immensely contributed to the success of Green Revolution and sustained production of food, fibre, fodder and feed. Due to intensification of agriculture, loss of biodiversity and reliance on monocropping, etc. biotic stresses due to pests and pathogens have increased. Last four decades of chemicalisation in agriculture, helped managing many pests and diseases but their application led to several problems like pesticide residues in food stuff, environmental pollution, imbalance of ecological equilibrium, and resurgence of minor pests and pathogens.

Leng, Zhang, Pan & Zhao (2011) conducted a study on the Application & Development Trends in Bio pesticides. Bio pesticides are very effective in the agricultural pest control without causing serious harm to ecological chain pollution. The research & development of practical application in the field of bio pesticides greatly mitigate environmental pollution caused by chemical pesticides. The development of bio pesticides stimulates modernization of agricultural for their traditional counter parts in pollution free agricultural production.

Mazid (2011) in the article stated chemical pest control agents are extensively used in all countries of the world but they are regarded as ecologically unacceptable. Therefore, there is an increased social pressure to replace them gradually with bio pesticides which are safe to humans and non-target organisms.

The harmful environmental implications of the synthetic chemicals have compelled to search for some alternative methods. This leads to increased development of compounds based on the models of naturally occurring toxins of biological origin, having various biological activities. Bio pesticides include a broad array of microbial pesticides, biochemical derived from micro-organisms and other natural sources, and processes involving the genetic modification of plants to express genes encoding insecticidal toxins.

Gupta and Dikshit (2010) conducted a study titled Bio pesticides, an eco-friendly approach for pest control. The study explored that an eco-friendly alternative to chemical pesticides is bio-pesticides. The study found that the interest in bio pesticides is based on the disadvantages associated with chemical pesticides. They emphasized that the stress on organic farming and on residue free commodities would certainly warrant increased adoption of bio pesticides by the farmers.

REFERENCES

1. Kumar, P. (3 march 2015) Business Line Newspaper
2. Kandpal,V. (2014) ,Bio-pesticides are eco-friendly pesticides, International Journal of Environmental Research and Development.ISSN 2249-3131 Vol 4, N0 2 (2014), pp. 191-196© Research India Publications. Available; <http://www.ripublication.com/ijerd.htm>
[10, May, 2015]
3. Kumar and Singh. (2014), Study on Bio pesticides for Integrated Crop Management. Available; <http://omicsonline.org>[22, April, 2015]
4. Agarwal, k.p. (2013), Organic Farming is Eco-friendly, Safe &Sustainable. Indian Journal of Agriculture, Vol 4(150), June 2013.
5. Agro Bio pesticides. (2013), Indian Journal of Agriculture, Vol5 (9) pp. Available; www.agrow.com [6, April, 2015]
6. Bhardwaj and Sharma. (2013), The Impact of Pesticides Industry in India, Vol 8(130-150), Available; <http://dx.doi.org>[10, April, 2015]
7. Katti,G, (2013), Bio pesticides for Insect Pest Management in Rice – Present Status and Future Scope, Journal of Rice Research 2013, Vol. 6 No.1,Available; gururajkatti@yahoo.com [18, April, 2015]
8. Quarles,W. (2013), New Bio pesticides for IPM and Organic Production, Volume XXXIII, Number 7/8, July/August 2013 (Published March 2013)
9. Upadhyay,V. (2013), study on, on Nuclear Polyhedrosis Virus (NPV), A Potential Bio pesticide (2013-september-13), Vol 8(127) pp. Available; <http://www.ijssat.com> [10, May, 2015]
10. Badhe. (2012), Constraints Faced by the Farmers in Bio pesticides Application in Anand District of Gujarat, Vol6 (28-41), Available; <http://omicsonline.org>. [10, April, 2013]

11. Kumar, s. (2012), Kumar S (2012), Bio pesticides: A Need for Food and Environmental Safety. J Biofertil Biopestici 3:e107. doi:10.4172/2155-6202.1000e107, Available; <http://dx.doi.org>[6, May, 2015]
12. Shafiq, A.M. (2012), Potential of Bio pesticides in Sustainable Agriculture: In Environmental Protection strategies for Sustainable Development, (eds.), Vol5, 529-595 pp.
13. Peng Fei Leng, Zhiming Zhang, Guangtang Pan &Maolin Zhao. (2011-December-30), African Journal of Biotechnology, Vol 10(86-94) pp. Available; www.agrow.com [20, Feb, 2015]
14. Mazid, s. (7 September 2011), Bio pesticides - a safe alternative to chemical control of pests, Vol 1(1-40) (, Available; International Journal of Science and Advanced Technology (ISSN 2221-8386), Available; <http://www.ijسات.com> [20, May, 2015]
15. Gupta and Dikshit. (2010), Bio pesticides, An Eco-friendly Approach for Pest Control, Vol 3 (25-38), Available; <http://www.ijسات.com>[15, April, 2015]

STUDY AREA

CHAPTER II

STUDY AREA

KALADY GRAMA PANCHAYAT

Kalady, the birthplace of great Advaita Philosopher Sree Sankaracharya, is one of the important pilgrim centres of Kerala .Kalady Grama Panchayat is one of the Panchayat in Ernakulum district that promote agriculture. Kalady Panchayat is an agricultural Panchayat, because most of the population in this Panchayat are engaged in agriculture and allied activities.

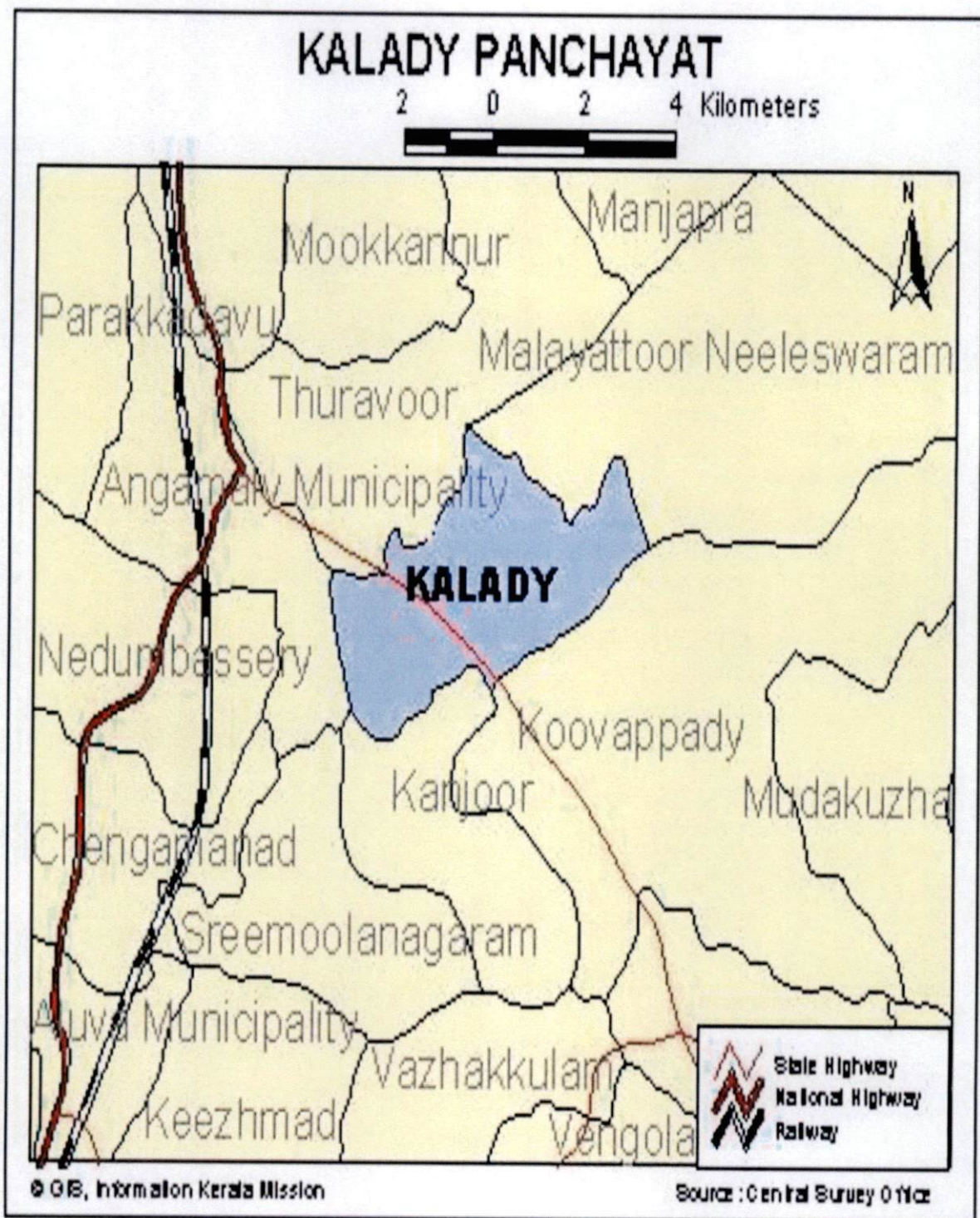
Kalady grama panchayat is under Angamaly block. Total area of the panchayat is 16.44 per cent .The panchayat consist of 17 wards. The total population of the panchayat is 24707.The number of male and female in the panchayat is 12564 and 12143 respectively. The total households of the panchayat is 1503.The total literacy of the panchayat is 88.28 percent, out of which the literacy level of male is 92.63 percent and that of female is 83.8 percent (according to the census 2011)

Table 2.1 The occupational structure of kalady grama panchayat

Sl.No	Occupation	Percentage
1	Cultivators	15
2	Agriculture labours	65
3	Service people	8
4	Skilled labours	5
5	Businessmen	5
6	Unemployed	2

Source: Panchayat vikasana rekha 2013-14

Kalady Grama Panchayat



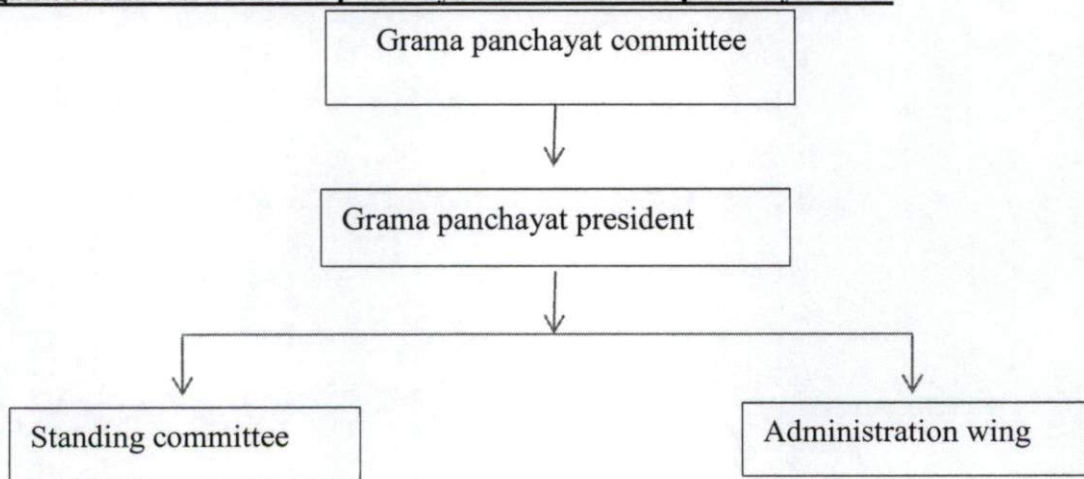
Agricultural profile of the panchayat

Main source of income for farmers in Kalady Grama Panchayat is from agriculture. Kalady Panchayat is an agricultural oriented place. Elephant foot yam is the main crop cultivated in this Panchayat, now a day Banana is also cultivated. These two are the main crop cultivated in this Panchayat. The other crops cultivated in this panchayat are Paddy, Coconut and vegetables. Most of the areas in Kalady Grama Panchayat are plain. Fertile soil is the characteristic of this Panchayat. In this Panchayat no one is unemployed, because most of the peoples are engaged in the farming/agricultural activities. The Panchayat will provide all support services to the farmers to develop their farming activities linked with krishibhavan. So Panchayat and Krishibhavan will provide all the facilities, support, services and financial assistances to the farmers linked with Krishibhavan. Increase in the standard of living of people is the main aim of this Panchayat, especially the weaker section ie, farmers and women.

Assistance from local government and Krishibhavan

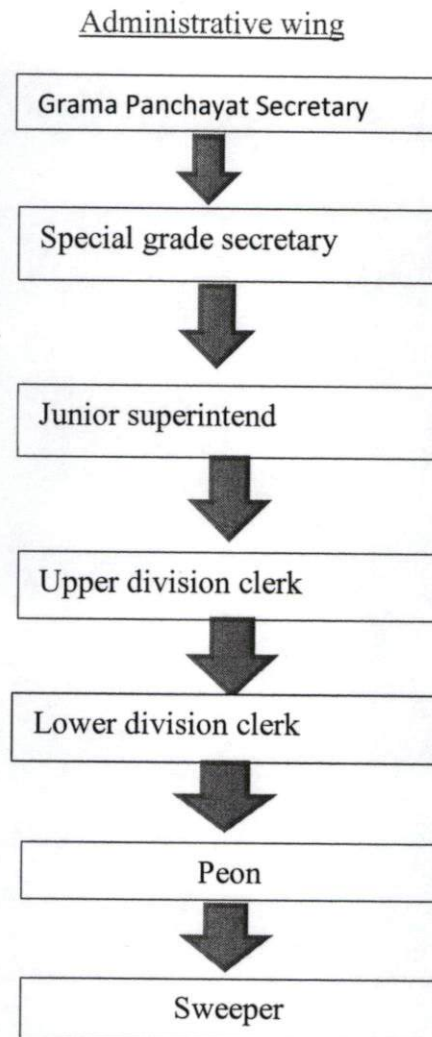
Agriculture is the main source of occupation of the Panchayat most of the population are engaged in agriculture and allied activities. Most of the farmers are using bio-control agents in their land. The Panchayat and Krishibhavan will provide subsidies to the farmers to meet their agriculture needs.

Organisational structure of panchayat at the Grama panchayat level



- Finance standing committee
- Welfare standing committee
- Development standing committee
- Education Health standing committee

Management and Administration of Kalady grama panchayat through elected representatives, employees and their composition



Management is vested with elected representatives from 15 wards, from them the president, vice-president, are elected. There are four standing committees namely finance welfare, development, public health, and education. Vice-president is the chairman of finance standing committee.

In Kalady Grama Panchayat, the grama sabha meetings are conducted once in 3 months. The Kalady Panchayat consist of educational institutions, ration shops, hospitals, anganawadis, NGO's, banks, commercial and cooperatives, marketing cooperatives, Industres, Industrial estates. There are daily and weekly markets.

Functions

As per the 11th schedule of the constitution of India list out developmental areas where local governments should have a role in planning for economic development, social justice and in the implementation of such plans. There is a clear recognition that there is a role – range for local governments as agent, adviser, manager, partner and actor- with the objective being to reduce the agency role and expand the autonomous – actor role.

Institutional Linkage

The Kalady Grama Panchayat is linked with Krishibhavan, Veterinary hospital and Kudumbasree units.

Table 2.2 Institutional linkage

Sl. No	Institutions	Nature of linkage
1.	Krishibhavan	<ul style="list-style-type: none">• Implementation of project and schemes• Providing financial assistance to Agricultural Development Programme.
2.	Veterinary Hospital	<ul style="list-style-type: none">• Treatment of livestock in the panchayat• Providing financial assistance to Livestock Development Programme.
3.	Kudumbasree	<ul style="list-style-type: none">• Providing trainings• Encouraging savings• Providing financial assistance
4.	Cooperative and commercial bank	<ul style="list-style-type: none">• Providing loans to farmers.

Source: panchayat

Major crops of the Panchayat

Elephant foot yam

Elephant foot yam is the major crop cultivated in the panchayat. 70 percent of farmers are cultivating elephant foot yam in their field.

Banana

Banana is the another important crop cultivated in the panchayat. 53 percent of farmers are cultivating banana in their land.

Paddy

Paddy is the another crop cultivated in the panchayat. 43 percent of farmers are cultivating paddy in the panchayat. The farmers are applying both chemical and bio pesticide in their paddy field, but most of the paddy cultivators are using bio-control agents.

Coconut

This is the another crop cultivated in the panchayat. 23 percent of farmers cultivating coconut in their field. But now adays the cultivation of coconut is reducing in the panchayat because of lack of labours.

Vegetables

Around 45percent of farmers cultivating different types of vegetables in their land. pumpkin, amaranths, bittergouard, snakegouard ,chilly, cabage ,pea, okra, cucurbits ,tomato ,colious, brinjal and drumstick are vegetables cultivated in the panchayat.

In this panchayat the farmers are using chemical pesticides and bio pesticides in farm land. The Panchayat and Krishibhavan jointly arranged the class to the farmers about the advantage effectiveness of the bio-control agents.so the users of the bio-control agents in the Panchayat is increasing now a day. Now a day the kudumbasree unit in this panchayat are using bio-control agents in their unit, for the purpose of increasing the awareness about bio-control agents in the mind of farmers &also the improvement of women community in the panchayat. Kalady grama Panchayat provide all facilities and support to the farmers for their sustainable development, because the main source of revenue of this panchayat is agricultural.

ANALYSIS

CHAPTER III

FARMER SATISFACTION TOWARDS BIO-CONTROL AGENTS IN KALADY GRAMA PANCHAYAT

ANALYSIS

3.1 INTRODUCTION

The history of agriculture dates back thousands of years and its development has been driven and defined by greatly different climates, cultures, and technologies. However, all farming generally relies on techniques to expand and maintain the lands suitable for raising domesticated species. Organic farming is one of the several approaches found to meet the objectives of sustainable agriculture. Organic farming is gaining momentum now a day. With the increased awareness about the health hazards from many of the chemical pesticides, the demand for bio-pesticide has been steadily increasing worldwide. Organic farming is one of the widely used methods, which are thought of as the best alternative to avoid the ill effects of chemical pesticides.

The present study is conducted in the Kalady Gram Panchayat of Ernakulum district. In this Panchayat most of the households are depending upon agriculture and allied activities. Kalady Panchayat is an agricultural oriented place. Agriculture is the main source of income of people in the Panchayat.

For the purpose of study data collected 30 farmers in kalady grama Panchayat who are using Bio-control agents. The findings of the study are given by sample farmers.

3.2 FARMING DETAILS

To obtain the farming details about the sample farmers, several aspects such as Details of crop cultivated, Years of experience, Financial assistance from government, Pesticide usage etc., were collected.

3.2.1 Details of Crops Cultivated

Major crops cultivated by the respondent farmers are listed below in table 3.1

Table3.1 Major crops cultivated by sample respondents

Crops Cultivates by respondents	No.of Farmers	Percentage
Paddy	13	43.3
Coconut	7	23.3
Banana	16	53.3
Pumpkin	3	10
Amaranths	6	20
Bittergouard	8	26.6
Snakegouard	5	16.6
Chilly	4	13.3
Cabbage	5	16.6
Elephant foot yam	21	70
Pea	13	43.3
Okra	4	13.3
Cucurbits	1	3.3
Tomato	6	20
Colious	3	10
Brinjal	2	6.6
Drumstick	2	6.6

Source: Primary Data collected using interview schedule

70 percent of user farmers are cultivating Elephant foot yam, 53.3 percent are cultivating Banana, Paddy and Pea are cultivated by 43.3 percent of sample farmers. Only 3.3 percent of sample farmers are cultivating Cucurbits. The study reveals that all the farmers are cultivating multiple crops in their land.

3.2.2 Years of experience in farming

Years of experience in farming will help us to know about how deep they are related to agriculture and allied activities.

Table 3.2 Years of experience

Years of experience(years)	No.of Farmers	Percentage
Up to 10 Years	5	16.67
More than 10 Years	25	83.33
More than 20 Years	13	43.33
More than 30 Years	1	3.33
	N=30	

Source: Primary Data collected using interview schedule

The table reveals almost all sample farmers have 10 years of experience in vegetable farming. 83.33 per cent of respondent farmers have experience of more than 10 years and 43.33 per cent of respondents having experience of more than 20 years. 3.33 per cent of respondent farmers have good experience in vegetable farming.

3.2.3 Financial Assistance from Government

An increased support like financial as well as technical help is necessary for any cultivator in order to meet the expenses occurring before and after the cultivation. As far as a Panchayat is concerned, subsidies available through the Krishi Bhavan is the major source which supports the farmers. Table 3.3 shows the extent of support available for the farmers in the Panchayat.

Table 3.3 Financial assistance from government for cultivation

Financial Assistance	No.of Farmers	Percentage
Yes	24	80
No	6	20
Total	30	100

Source: Primary Data collected using interview schedule

Table above indicated that 80 per cent of the respondents obtained financial assistance from government for vegetable cultivation. All those who avail financial assistance from government stated that subsidy through krishibhavan is the only source of financial assistance obtained by them.

3.2.4 Pesticide Usage

All the sample farmers reported use of Bio-control agents in farming activities. However none of the are totally depended on bio pesticides only. Rather 'They use chemical pesticides also'.

3.3 AWARENESS REGARDING BIO-CONTROL AGENTS

To obtain awareness level regarding bio-control agents about the sample farmers, several aspects such as awareness regarding the advantage and limitation of bio-control agents, various bio-control agents available in the market, current source of purchase of bio-control agents, awareness regarding government policy on organic farming, preparation, application, method and cost of bio-control agents, source of awareness about bio-control agents and regular source of awareness about bio-control agents, awareness regarding KAU bio pesticides etc. were collected and analysed. The results are given below.

3.3.1 Awareness regarding the advantage and limitation of bio-control agents

3.3.1.1 Advantage of bio-control agent

The extent of awareness by respondent farmers on advantage of bio-control agents as revealed by the study .

Table 3.4 Advantage of bio-control agents

Sl. No	Advantages	No.of Farmers	Percentage
1	Protect the health of human being	25	83.3
2	Higher yield through continuous use of bio pesticides	10	33.3

Source: Primary Data collected using interview schedule

The above table reveals that the respondent farmers are not fully aware about the advantage of bio-control agents. 83.3 per cent of the respondents preserve that bio-control agents can protect human health and 33.3 per cent preserve that continues use of bio pesticides can provide higher yield.

Some of the sample respondents found both the above advantage and few of them both. It should be specifically noted that none of the respondents are aware about the advantage of use of bio-control agents.

3.3.1.2 Limitation of bio-control agents as perceived by respondents

The study revealed that 83.3 per cent of the respondents consider price of bio-control agents as very high, compared to that of chemical pesticides. The farmers do not perceive any other limitation for bio-control agents. We may infer that reduction of price of bio-control agents through subsidies may be a good for increase their use.

3.3.2 EXTENT OF AWARENESS REGARDING VARIOUS BIO-CONTROL AGENTS

Table 3.5 below gives the per cent of sample farmers aware about various bio-control agents.

Table 3.5 Various bio-control agents

Bio-control agents	No.of Framers	Percentage
Trichoderma	29	96.6
Trichograma	3	10
Trichocard	6	20
Verticelium	9	30
Metarizhysim	2	6.6
Tobaco decoation	30	100
Fruit trap	22	73.3
Pheromone trap	6	20
Neem cake	29	96.6
Pseudomonas	29	96.6
Beuveriya	2	6.6
Feusarium	3	10
Cow-urine chilli extract	27	90
Neem oil emulsion	29	96.6
Kerosene emulsion	27	90

Source: Primary Data collected using interview schedule

The above table shows that most of the respondents are awareness-Tobaco decoation(100%),Neem cake,Trichoderma,Pscedomonas and Neem oil emulsion-(96.6%),Cow-urine chilly extract and Kerosine-neem emulsion-(90%).73.3 per cent of the farmers are aware about Fruit trap.Percent of farmers aware about other bio-control agents,namely-Verticelium(30%),Trichocard(20%),Pheromonetrap(20%),Trichograma(10%),Feusarium(10%),Metarizhysim(6.6%), and Beuveriya(6.6%) is very low. The measure should be taken to improve awareness of these bio-control agents. It should also be noticed that all the bio-control agents which are generally known to the farmers are traditional in nature.

However responses on question relating to knowledge of preparation, application method and price details revealed that the actual level of awareness about all these bio-control agents is very poor; the respondent just heard know the names of various bio-control agents.

3.3.3 Current Source of Purchase of Bio-control Agents

Current sources of purchase of bio-control agents by the respondents are given below in table 3.6

Table 3.6 Current source of purchase

Current source	No.of Farmers	Percentage
Krishibhavan	2	6.6
Fertilizer depot	7	23.3
Private agency	29	96.6
Home made	21	70
From other farmers	10	33.3

Source: Primary Data collected using interview schedule

Above table shows that private agencies are the main source of bio-control agents for the farmers.70 per cent of the respondents prepare some bio-control agents for their use at their homes itself. Dependence of Krishibhavan, Fertilizer depot of co-operatives and Fellow farmers for purchase of bio-control agents is limited.

3.3.4 Awareness regarding the Schemes of Government

The study revealed that the respondents are not at all aware about policy of government of Kerala to promote organic farming and to convert Kerala state to a organic farming state. It reveals that objective policy in this regard require better promotion and publicity.

3.3.5 Source of Awareness about Bio-control Agents

The responses sources of awareness about bio-control agents is given below in table 3.7

Table 3.7 Source of awareness regarding bio-control agents among the farmers

Particulars	No.of Farmers	Percentage
All India Radio	5	16.6
Television	28	93.3
Krishibhavan	18	60
News Paper	28	93.3
Agricultural Magazine	30	100
Training Class	12	40

Source: Primary Data collected using interview schedule

The above table shows that agricultural related magazines are the most popular source of awareness regarding bio-control agents. 'All the respondents depend on them'. Television and Newspaper each are depended by 93.3 per cent of the farmers for gaining awareness on bio-control agents. 60 per cent respondents depend on Krishibhavan and 40 per cent on Training programs for gaining awareness on bio-control agents. All India Radio seeme to be the least popular source of awareness among the sample respondents.

3.3.6 Regular Source of Awareness about Bio-control Agents

Table gives the most preferred and regularly depended source of awareness on bio-control agents.

Table 3.8 Regular source of awareness regarding bio-control agents

Particulars	No.of Farmers	Percentage
Agricultural Magazine	25	83.33
All India Radio	1	3.33
Television	8	26.67
Television&Agrl.Magazine	3	10
Agrl.Magazine&Krishibhavan	1	3.33

Source: Primary Data collected using interview schedule

The above table shows that most regularly used sources of awareness creation among farmers is magazines related to agricultural .83.33 per cent of the respondents use this source of awareness.26.67 per cent regularly listen to TV programmes relating to agriculture. Other sources of awareness are regularly used by very few respondents. It should also be noticed that a few farmers regularly use multiple sources for gaining knowledge on agriculture in general and bio-control agents in specific.

3.3.7 Awareness Regarding Bio-control agents Of KAU

Data collected from respondents revealed that farmer awareness of KAU bio-control agents in the study area is very very poor. Only 2 (6.6%) of the respondents know about Pseudomonas of KAU and 1(3.3%) knows about Trichoderma. None of the respondents know about any other bio-control agents prepared in made available by KAU.

This shows need for KAU building up better linkage with farmer related institution and farmers of the study area.

3.3.8 Periodicity of Use of Bio-control Agents

The periodicity of use of bio-control agents by the sample farmers is given in table 3.9 below

Table 3.9 Frequency of use of bio-control agents

Category	No.of Farmers	Percentage
Daily	-	-
Weekly	16	53.4
Monthly	-	-
No specific time	14	46.6
Total	30	100

Source: Primary Data collected using interview schedule

Table above makes it clear that majority of the respondents (53.4%) apply bio-control agents on weekly basis, rest of the respondents (46.6%) have no specific periodicity in using bio-control agents.

3.3.9 Factors influencing the purchase of bio-control agents

Data on these factors are presented in table 3.10 below.

Table 3.10 Factors influencing during purchase of bio-control agents

Particulars	No.of farmers	Percentage
Cost	21	70
Health issues	11	36.6
Efficiency	5	16.7
Availability	10	33.3
Yield	28	93.3
Ease of usage	9	30
Suitability to crops	26	86.6
Suggestion of farmers	8	26.6
Opinion of Agricultural Officer	5	16.6

Source: Primary Data collected using interview schedule

The table shows that Yield (93.3%), Suitability to crops (86.6%) and Cost (70%) are the major (in the order of ranks) are significant factors influencing farmers use of bio-control agents. All the other factors studied have comparatively lesser degree of influence on purchase in use of bio-control agents

3.3.10 Preference of Brands

The data collected reveals that none of the farmers have any brand preference for bio-control agents.

3.3.11 Use of leaf extract

Analysis of data collected on use of leaf extract as a bio-control agent showed that 20 per cent of the respondents are using leaf extract. All of them are using leaf of neem tree only. No other leaf extract is used by respondent farmers.

3.3.12 New Innovation

Innovation of farmers on use of bio-control agents

Table 3.11 New Innovations of Farmers

Category	No.of farmers	Percentage
Yes	-	-
No	30	100
Total	30	100

Source: Primary Data collected using interview schedule

The study reveals that the sample farmers have not adopted any innovation of there on in the usage of bio-control agents.

3.4 ATTITUDE OF FARMERS TOWARDS BIO-CONTROL AGENTS

In this study an attitude index has been constructed as detailed below for measuring attitude of farmers towards bio-control agents.

Calculation of Attitude Index

For constructing attitude index the responses were collected on different aspects and the responses were assign the marks of 5,4,3,2 and 1 representing the most positive degree of opinion to most negative degree of opinion.

- *Scores for calculation of attitude index*

Degree of opinion	Scores
Highly Favorable	5
Favorable	4
Neither favorable nor Unfavorable	3
Unfavorable	2
Highly unfavorable	1

- The scores of all the degrees of opinions for each attribute were summed up to arrive the total score
- Total Score Received = (total number of responses of 'strongly agree' * 5) + (total number of responses of 'agree' * 4)+(total number of responses of 'no opinion' * 3)+(total number of responses of 'disagree' * 2)+(total number of responses of 'strongly disagree * 1)
- The total score thus obtained by each attribute was then divided by the maximum possible score for that attribute to obtain the index of that attribute
- Index =Total Score/Maximum Score for that attribute *100

- Based on the index value the attitude of the farmers is evaluated as highly unfavourable(AI Value ≤ 30),unfavourable(AI Value >30 but ≤ 50),neither favourable nor unfavourable(AI Value >50 but ≤ 70),favourable(AI Value > 70 but ≤ 90) and highly favourable(AI Value >90)
- The computed values of attitude index for various factors studied the computed values are presented below in table 3.12

❖ **Table 3.12 Attitude Index**

Sl. No	Statement	Total Score	%
1	Use of bio pesticide improve the quality of agricultural products	149	99.3
2	Use of bio pesticides is much easier than using chemical pesticide	60	40
3	Bio pesticides preserves the environment and soil	149	99.3
4	Use of bio pesticides helps to protect the human and animal health	150	100
5	Use of bio pesticide is a cost effective pest control measures	51	34
6	Use of bio pesticides on the crops helps to control the pest completely	145	96.6
7	Demand to the fruit and vegetables cultivated using bio pesticide is high in the market	149	99.3
8	Farmer could earn better price for above products in the market	143	95.3
9	Use of bio pesticides results in the better yield	144	96
10	Use of bio pesticide on the crops require less care and management practice	56	37.3
Composite Index		79	

Source: Primary Data collected using interview schedule

The sample farmers have, in general, a favourable attitude towards bio-control agents. Their responses to specific questions relating to the ability of bio-pesticides to protect the human and animal health (100%), its ability to preserve environment and soil (99.3%), to improve the quality of agricultural products (99.3%), to control pest completely (96.6%) are highly favourable. They have also highly favourable responses towards demand for fruits and vegetables cultivated using bio-pesticides (99.3%), ability of bio-pesticides to provide better yield (96%) and market price of fruits and vegetables cultivated using bio-pesticides(95.3%).

However do not agree to the statements like use of bio pesticides is much easier than using chemical pesticide (40%), use of bio pesticide is a cost effective pest control measures (34%) and use of bio pesticide on the crops require less care and management practice (37.3%).In other words they feel that use of bio pesticides is difficult than using chemical pesticide, use of bio pesticides is costly and it requires more care and attention.

3.5 SATISFACTION AMONG USER FARMERS OVER THE USE OF BIO-CONTROL AGENTS

The future use of any product depends on the level of satisfaction from the past and current use of the product. The following few paragraphs attempt to measure the level of satisfaction of the respondent farmer over the use of bio-control agents. For this purpose an overall satisfaction index is computed as explained below.

1. The level of satisfaction on various aspects relating to bio-control agents were collected from the respondents on a contineum scale Highly Satisfied, Satisfied, No Opinion, Dissatisfied and Highly Dissatisfied.
2. Each level of satisfaction referred to in step 1 above is assigned a score as mentioned below.

- Score for calculation of satisfaction index

<i>Scale</i>	<i>Score</i>
Highly Satisfied	5
Satisfied	4
No Opinion	3
Dissatisfied	2
Highly Dissatisfied	1

3. Total score obtained for each factor is computed and satisfaction index for the specific factor is computed by applying the formula

4. Total Score Obtained / (Maximum Possible Score (i.e., 5(Maximum score) * 30(No of user farmers of bio –control agents) * 100

- Total Score Received = (total number of responses of ‘highly satisfied’ * 5) + (total number of responses of ‘satisfied’ * 4)+(total number of responses of ‘no opinion’ * 3)+(total number of responses of ‘dissatisfied’ * 2)+(total number of responses of ‘highly dissatisfied’ * 1)

5. Based on the index value satisfaction level of each index is evaluated as highly dissatisfied farmers (SI Value ≤ 30), dissatisfied farmers (SI Value >30 but ≤ 50), Farmers having no opinion (SI Value >50 but ≤ 70), satisfied farmers (SI Value > 70 but ≤ 90) and highly satisfied farmers (SI Value >90).

6. An overall satisfaction index constructed by averaging the index value for specific factors and based on this index the overall level of satisfaction is rated as mentioned above.

- The result of this analysis is presented below in table 3.13 satisfaction towards use of bio-control agents.

Table 3.13 Satisfaction Index

Sl. No	Factors	Total Score	Satisfaction Index
1	Availability	62	41.3
2	Cost	35	23.3
3	Effectiveness	122	81.3
4	Mode of application of bio pesticides	114	76
5	Expenses incurred while adopting bio pesticide for crop protection	49	32.6
6	Technical assistance from krishibhavan	101	67.3
7	Assistance from government/other institution	87	58
8	Yield of agricultural products obtained through use of bio pesticides	144	96
9	Technical assistance getting from KAU	102	68
10	Demand for organically produced items in the market	144	96
11	The shelf life of agriculture products produced by the usage of bio pesticides	95	63.3
12	Shelf life of bio pesticides	88	58.6
13	Subsidies	103	68.6
Total		1246	83

Source: Primary Data collected using interview schedule

The above table shows that farmers have very high level of satisfaction on Yield of agricultural products obtained through use of bio pesticides(SI-96%) and Demand for organically produced items(SI-96%). They are also satisfied with factors like Effectiveness of bio-control agents (SI-81.3%), and Mode of their application (SI-76%) as a whole. They are indifferent on aspects like Technical and other assistance from Krishibhavan, (SI-67.3%)Government(SI-58%), KAU and other institutions(SI-68%),Shelf life of products produced by usage of bio pesticides(SI-63.3%), Subsidies(SI-68.6%) and Shelf life of bio pesticides(SI-58.6%) .

They have express dissatisfaction towards Availability (SI-41.3%) and Expenses for adopting bio pesticides(SI-32.6%) and are highly dissatisfied on Cost of bio-control agents(SI-23.3%).It seems that they experience Non-availability of suitable bio-control agents and also incur heavy cost on its adoption, purchase and application. Suitable measures must be taken to make them available to an adequate extent and affordable prices and to develop costless method of applying them.

3.6 CONSTRAINTS IN ADOPTING BIO-CONTROL AGENTS

Risk and constraints may be there, while converting a farm land for organic farming. It may be Financial constraint, Technical constraint or Marketing constraint. The following table show the major Financial, Technical and Marketing constraints and the farmers opinion towards those constraints.

3.6.1 Financial Constraints:

Financial constraints faced by the farmers in the adoption of bio-control agents is shown in table 3.21 below.

Table 3.14 Financial constraints in adopting bio-control agents on plants

Sl.No	Constraints	No. of Farmers	Percentage
1	Poor Economic condition of farmers	30	100
2	Lack of support from financial institutions	30	100
3	High capital investment	30	100
4	High market price	30	100
5	Lack of subsidy	24	80
6	High wage cost	9	30
7	High transportation cost	8	26.6

Source: Primary Data collected using interview schedule

The study reveals that Poor economic condition of farmers (100%), Lack of support from financial institutions (100%), High capital investment (100%), and High market price (100%) are the major financial constraints faced by the user farmers in adopting bio-control agents. Lack of subsidy (80%) is also a serious issue. Wage (30%) and Transportation cost (26.6%) are not significant.

3.6.2 Technical Constraints:

Technical constraints faced by the farmers in adoption and use of bio-control agents are examined.

Table 3.15 Technical Constraints in adopting Bio-control agents on plants

Sl No	Constraints	No. of Farmers	Percentage
1	Lack of awareness about the benefit of bio-control agents	30	100
2	Lack of awareness about bio-control agent available in the market	30	100
3	Lack of awareness about pest control methods	30	100
4	Lack of awareness about preparation of bio -control agents	29	96.6
5	Lack of classes from krishibhavan	28	93.3
6	Non-availability of equipments	5	16.6
7	Duration of storing bio-control agents	25	83.3

Source: Primary Data collected using interview schedule

Table 3.22 shows that Lack of awareness about the benefit of bio-control agents (100%), Lack of awareness about bio-control agents available in the market (100%), Lack of awareness about pest control methods (100%) are the major constraints. On availability of equipment (16.6%) is not much a serious issue for the farmers in adopting bio-control agents

3.6.3 Marketing Constraint:

Marketing constraints faced by the sample farmers in adopting bio-control agents is shown below in table 3.23

Table 3.16 Market Constraints in adopting Bio-control agents on Plants

Sl No	Constraints	No .of Farmers	Percentage
1	Inadequate availability of bio-control agents	30	100
2	Constraints of lack of availability of price details	28	93.3
3	Existence of preference of fake organic vegetables and fruits in the market	30	100
4	Competition from other products	28	93.3
5	Distance for bio pesticide product market	6	20
6	Distance for bio pesticide market	13	43.3

Source: Primary Data collected using interview schedule

The study reveals that Inadequate availability of bio-control agents(100%), Existence of fake organic vegetables and fruits in the market (100%),Lack of information of organic price details(93.3%), and Competition from inorganic products(93.3%) are major constraints faced by almost all the respondent farmers.

CONCLUSION

Kerala Government is aiming at reducing the use of chemical pesticides among the farmers in Kerala. Organic farming is one of the widely used methods, which is thought of as the best alternative to avoid the ill effects of chemical pesticides. Kerala Government has declared that by 2016 the agriculture sector in Kerala will be turned completely to organic farming. This chapter aimed at understanding the awareness, attitude, satisfaction and difficulties in adoption of bio pesticides among farmers. The data obtained through survey in Kalady Panchayat. In this Panchayat krishibhavan has to take initiative to promote use bio pesticide in the farm.

SUMMARY OF FINDINGS,
SUGGESTIONS AND CONCLUSIONS

CHAPTER -IV

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSIONS

4.1. INTRODUCTION

Organic farming is one of the several approaches found to meet the objectives of sustainable agriculture. Bio-control agents are very effective in the agricultural pest control without causing serious harm to ecological chain or worsening environmental pollution. The potential of bio-control agents for promoting sustainable agriculture has been known for many years. To the rapid increase in population and demand of food materials has initiated the large use of pesticide. Bio pesticides are one of the best bio control methods to prevent the loss done by the chemicals. In our local area many such plants, waste matter etc. are available. From which these Bio pesticides can be prepared by using natural means only. The total world production of bio pesticides is over 3,000 tons/yr., which is increasing at a rapid rate.

4.2 SUMMARY OF FINDINGS

4.2.1 WORK DESIGN

- Organic farming is gaining momentum now a day.
- With the increased awareness about the health hazards from many of the chemical pesticides, the demand for bio-pesticide has been steadily increasing worldwide.
- Organic farming is one of the widely used methods, which are thought of as the best alternative to avoid the ill effects of chemical pesticides.
- Bio pesticides are certain types of pesticides that are derived from natural materials like plants (Botanical origin), bacteria, fungi, virus (Microbial origin) and certain minerals.
- A number of government agencies, including the Ministry of Agriculture and the Department of Biotechnology, are engaged in supporting research, production and application of these agents.
- The demand for bio-pesticides is rising steadily in all parts of the world.
- In India, so far only 12 types of bio pesticides have been registered under the Insecticide Act, 1968.

- Neem based pesticides, Bacillus thuringensis, NPV and Trichoderma are the major bio pesticides produced and used in India.
- Today, Government various institutions ,NGO's ,Kudumbasree etc. provided maximum support to organic farmers for the production of chemical free organic products and improving the standard of living.
- Kerala Government has declared that by 2016 the agriculture sector in Kerala will be turned completely to organic farming.

4.2.2 STUDY AREA

- Kalady Grama Panchayat is the study area
- Kalady, the birthplace of great Advaita Philosopher Sree Sankaracharya, is one of the important pilgrim centres of Kerala.
- Kalady panchayat is an agricultural panchayat, because most of the population in this panchayat are engaged in agriculture and allied activities.
- Kalady grama panchayat is under angamaly block
- The total area of the panchayat is 16.44%.
- The panchayat have 17 wards.
- The total population of the panchayat is 24707.
- Around 65%of persons are agriculturist in this panchayat.
- Main source of income for farmers in Kalady Grama Panchayat is from agriculture.
- Elephant foot yam is the main cultivated crop in the panchayat.
- Most of the areas in kalady grama panchayat is plain.
- Fertile soil is the characterstic of this panchayat.
- The panchayat and krishibhavan will provide subsidies to the farmers for meeting their agriculture needs.

4.2.3 ANALYSIS

❖ SOCIO-ECONOMIC VARIABLES

✓ FARMING DETAILS

- 70 per cent of user farmers are cultivating Elephant foot yam in their land.
- All the farmers are cultivating multiple crops in their land.
- Almost all sample farmers have 10 years of experience in vegetable farming.

- 3.33 per cent of respondent farmers have good experience in vegetable farming.
- 80 per cent of the respondents obtained financial assistance from government for vegetable cultivation.
- Subsidy through krishibhavan is the only source of financial assistance obtained by them.
- All the sample farmers reported use of Bio-control agents in farming activities.
- However none of the are totally depended on bio pesticides only. Rather they use chemical pesticides also.
- ✓ **AWARENESS REGARDING BIO-CONTROL AGENTS**
- The respondent farmers are not fully aware about the advantage of bio-control agents.
- None of the respondents are aware about the advantage of use of bio-control agents.
- 83.3 per cent of the respondents consider price of bio-control agents as very high, compared to that of chemical pesticides.
- The farmers do not perceive any other limitation for bio-control agents.
- 100 per cent of the respondents aware about Tobacco decoation.
- All the bio-control agents which are generally known to the farmers are traditional in nature.
- Responses on question relating to knowledge of preparation, application method and price details revealed that the actual level of awareness about all these bio-control agents is very poor; the respondent just heard know the names of various bio-control agents.
- Private agencies are the main source of bio-control agents for the farmers.
- 70 per cent of the respondents prepare some bio-control agents for their use at their homes itself.
- Dependence of Krishibhavan, Fertilizer depot of co-operatives and Fellow farmers for purchase of bio-control agents is limited.

- The respondents are not at all aware about policy of government of Kerala to promote organic farming and to convert Kerala state to a organic farming state.
- Agricultural related magazines are the most popular source of awareness regarding bio-control agents.
- All India Radio seeme to be the least popular source of awareness among the sample respondents.
- Most regularly used sources of awareness creation among farmers is magazines related to agricultural.
- A few farmers regularly use multiple sources for gaining knowledge on agriculture in general and bio-control agents in specific.
- Data collected from respondents revealed that farmer awareness of KAU bio-control agents in the study area is very very poor.
- Only 2 (6.6%) of the respondents know about Pseudomonas of KAU and 1(3.3%) knows about Trichoderma.
- None of the respondents know about any other bio-control agents prepared in made available by KAU.
- Majority of the respondents (53.4%) apply bio-control agents on weekly basis, rest of the respondents (46.6%) have no specific periodicity in using bio-control agents.
- Yield (93.3%), Suitability to crops (86.6%) and Cost (70%) are the major (in the order of ranks) are significant factors influencing farmers use of bio-control agents.
- None of the farmers have any brand preference for bio-control agents.
- 20 per cent of the respondents are using leaf extract.
- All of them are using leaf of neem tree only.
- The sample farmers have not adopted any innovation of there on in the usage of bio-control agents.

❖ ATTITUDE OF FARMERS TOWARDS BIO-CONTROL AGENTS

- The sample farmers have, in general, a favourable attitude towards bio-control agents.
- The ability of bio-pesticides to protect the human and animal health (100%), its ability to preserve environment (99.3%), to improve the quality of agricultural products (99.3%), to control pest completely (96.6%) are highly favourable.
- They have also highly favourable responses towards demand for fruits and vegetables cultivated using bio-pesticides (99.3%), ability of bio-pesticides to provide better yield (96%) and market price of fruits and vegetables cultivated using bio-pesticides.(95.3%)
- The respondents do not agree to the statements like use of bio pesticides is much easier than using chemical pesticide(40%),use of bio pesticide is a cost effective pest control measures(34%) and use of bio pesticide on the crops require less care and management practice(37.3%).

❖ SATISFACTION AMONG USER FARMERS OVER THE USE OF BIO-CONTROL AGENTS

- The respondent farmers have very high level of satisfaction on Yield of agricultural products obtained through use of bio pesticides (SI-96%) and Demand for organically produced items (SI-96%).
- They are also satisfied with factors like Effectiveness of bio-control agents (SI-81.3%), and Mode of their application as a whole (SI-76%).
- They are indifferent on aspects like Technical and other assistance from Krishibhavan(SI-67.3%), Government(SI-58%), KAU and other institutions(SI-68%),Shelf life of products produced by usage of bio pesticides(SI-63.3%), Subsidies(SI-68.6%) and Shelf life of bio pesticides(SI-58.6%) .
- They have express dissatisfaction towards Availability (SI-41.3%) and Expenses for adopting bio pesticides (SI-32.6%)
- The respondent farmers are highly dissatisfied on Cost of bio-control agents (SI-23.3%).

❖ CONSTRAINTS IN ADOPTING BIO-CONTROL AGENTS

✓ Financial Constraints

- Poor economic condition of farmers (100%), Lack of support from financial institutions (100%), High capital investment (100%), and High market price (100%) are the major financial constraints faced by the user farmers in adopting bio-control agents.
- Lack of subsidy (80%) is also a serious issue.
- Wage (30%) and Transportation cost (26.6%) are not significant.

✓ Technical Constraints

- Lack of awareness about the benefit of bio-control agents (100%), Lack of awareness about bio-control agents available in the market (100%), Lack of awareness about pest control methods (100%) are the major constraints.
- Non availability of equipment (16.6%) is not much a serious issue for the farmers in adopting bio-control agents

✓ Marketing Constraint

- Inadequate availability of bio-control agents (100%), Existence of fake organic vegetables and fruits in the market (100), Lack of information of organic price details (93.3%), and Competition from inorganic products (93.3%) are major constraints faced by almost all the respondent farmers.

❖ 4.3 SUGGESTIONS

- Provide Seminars, Classes, Training programmes, to the farmers for creating more awareness about bio-control agents.
- Provide classes to the farmers for creating awareness about preparation of bio-control agents.
- Create better awareness about bio-control agents to others with the help of farmers who are involved in organic farming.

- Provide maximum support to women's for entering in to agriculture organic farming with the help of SHG'S, Kudumbasrees, etc.
- More training facilities should be provided for the preparation of bio-control agents.
- Provide more financial support to the farmers who are using bio-control agents in their land.
- Provide Government assistance to the farmers.
- Provide more subsidies to the farmers through krishibhavan.
- The activities of Cluster units and Padashekara Samithi have to be more activated.
- Provide better publicity and promotion about bio-control agents to the farmers
- Create better awareness about bio-control agents available in the KAU
- Reduce the cost of bio-control agents.

❖ 4.4 CONCLUSION

Kalady Panchayat is an agricultural oriented place. Most of the persons in this Panchayat are engaged in agriculture allied activities. Agriculture is the main source of revenue of this Panchayat. Elephant foot yam is the main crop cultivated in this Panchayat, now a day Banana is also cultivated. Today the Panchayat and krishibhavan jointly arranged class to the farmers about the advantage, effectiveness of the bio-control agents. Now a day the kudumbasree unit is also using bio-control agents in their unit. Kalady grama Panchayat provide all facilities support to the farmers for their sustainable development. In this Panchayat krishibhavan has to take initiative to use bio-control agents in the farm. They provide all the support and facilities to the farmers for improving the use of bio-control agents in this Panchayat.

BIBLIOGRAPHY

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1. Kumar, P. (3 march 2015) Business Line Newspaper
2. Kandpal, V. (2014) ,Bio-pesticides are eco-friendly pesticides, International Journal of Environmental Research and Development. ISSN 2249-3131 Vol 4, N0 2 (2014), pp. 191-196© Research India Publications. Available; <http://www.ripublication.com/ijerd.htm>
[10, May, 2015]
3. Kumar and Singh. (2014), Study on Bio pesticides for Integrated Crop Management. Available; <http://omicsonline.org>[22, April, 2015]
4. Agarwal, k.p. (2013), Organic Farming is Eco-friendly, Safe & Sustainable. Indian Journal of Agriculture, Vol 4(150), June 2013.
5. Agro Bio pesticides. (2013), Indian Journal of Agriculture, Vol5 (9) pp. Available; www.agrow.com [6, April, 2015]
6. Bhardwaj and Sharma. (2013), The Impact of Pesticides Industry in India, Vol 8(130-150), Available; <http://dx.doi.org>[10, April, 2015]
7. Katti, G, (2013), Bio pesticides for Insect Pest Management in Rice – Present Status and Future Scope, Journal of Rice Research 2013, Vol. 6 No.1, Available; gururajkatti@yahoo.com [18, April, 2015]
8. Quarles, W. (2013), New Bio pesticides for IPM and Organic Production, Volume XXXIII, Number 7/8, July/August 2013 (Published March 2013)
9. Upadhyay, V. (2013), study on, on Nuclear Polyhedrosis Virus (NPV), A Potential Bio pesticide (2013-september-13), Vol 8(127) pp. Available; <http://www.ijrsat.com>
[10, May, 2015]
10. Badhe. (2012), Constraints Faced by the Farmers in Bio pesticides Application in Anand District of Gujarat, Vol6 (28-41), Available; <http://omicsonline.org>. [10, April, 2013]

11. Kumar, s. (2012), Kumar S (2012), Bio pesticides: A Need for Food and Environmental Safety. J Biofertil Biopestici 3:e107. doi:10.4172/2155-6202.1000e107, Available; <http://dx.doi.org>[6, May, 2015]
12. Shafiq, A.M. (2012), Potential of Bio pesticides in Sustainable Agriculture: In Environmental Protection strategies for Sustainable Development, (eds.), Vol5, 529-595 pp.
13. Peng Fei Leng, Zhiming Zhang, Guangtang Pan &Maolin Zhao. (2011-December-30), African Journal of Biotechnology, Vol 10(86-94) pp. Available; www.agrow.com [20, Feb, 2015]
14. Mazid, s. (7 September 2011), Bio pesticides - a safe alternative to chemical control of pests, Vol 1(1-40) (, Available; International Journal of Science and Advanced Technology (ISSN 2221-8386), Available; <http://www.ijسات.com> [20, May,2015]
15. Gupta and Dikshit. (2010), Bio pesticides, An Eco-friendly Approach for Pest Control, Vol 3 (25-38), Available; <http://www.ijسات.com>[15, April, 2015]

ABSTRACT

ABSTRACT

The study was undertaken to analyse the level of awareness of farmers towards various bio-control agents available in the market, To analyse the buying behaviour of farmers towards bio-control agents and To identify the major challenges for adoption of bio-control agents. Bio pesticides are certain types of pesticides that are derived from natural materials like plants (Botanical origin), bacteria, fungi, virus (Microbial origin) and certain minerals. The Bio Pesticides control pests / diseases either selectively or with broad spectrum approach. The study was conducted among weaker farmers in kalady Panchayat in Ernakulum District. The sample consist of 30 farmers who are cultivating Elephant foot yam, paddy, vegetables or banana were selected from Kalady Panchayat of Ernakulum district in Kerala state by using purposive sampling. The sample size 30, were farmers using bio-control agents. The data collected were analysed with the help of appropriate tools such as percentages analysis, attitude index and satisfaction index method. Main source of income for farmers in Kalady Grama Panchayat is from agriculture. Krishibhavan provide adequate subsidies to individual farmers well as through panchayat schemes. Vegetable Cluster Scheme, Paddy Development Scheme, Coconut Development Scheme are the main schemes provided by krishibhavan to farmers linked with panchayat. Now a day the kudumbasree unit in this panchayat are using bio-control agents in their unit, for the purpose of increasing the awareness about bio-control agents in the mind of farmers &also the improvement of women community in the panchayat. Kalady grama Panchayat provide all facilities and support to the farmers for their sustainable development, because the main source of revenue of this panchayat is agricultural. Elephant foot yam is the main crop cultivated in this Panchayat, now a day Banana is also cultivated. All the farmers are cultivating multiple crops in their land. Almost all sample farmers have 10 years of experience in farming. 3.33 per cent of respondent farmers have good experience in farming. 80 per cent of the respondents obtained financial assistance from government for vegetable cultivation. All those who availe financial assistance from government stated that subsidy through krishibhavan is the only source of financial assistance obtained by them. All the sample farmers reported use of Bio-control agents in farming activities. However none of the are totally depended on bio pesticides only. Rather 'They use chemical pesticides also'. The respondent farmers are not fully aware about the advantage of bio-control agents. It should be specifically noted that none of the respondents are aware about the advantage of use of bio-control agents.

83.3 per cent of the respondents consider price of bio-control agents as very high, compared to that of chemical pesticides. All the bio-control agents which are generally known to the farmers are traditional in nature. However responses on question relating to knowledge of preparation, application method and price details revealed that the actual level of awareness about all these bio-control agents is very poor; the respondent just heard know the names of various bio-control agents. Private agencies are the main source of bio-control agents for the farmers. 70 per cent of the respondents prepare some bio-control agents for their use at their homes itself. Dependence of Krishibhavan, Fertilizer depot of co-operatives and Fellow farmers for purchase of bio-control agents is limited. The respondents are not at all aware about policy of government of Kerala to promote organic farming and to convert Kerala state to a organic farming state. Agricultural related magazines are the most popular source of awareness regarding bio-control agents. All India Radio seeme to be the least popular source of awareness among the sample respondents. Most regularly used sources of awareness creation among farmers is magazines related to agricultural. It should also be noticed that a few farmers regularly use multiple sources for gaining knowledge on agriculture in general and bio-control agents in specific. Data collected from respondents revealed that farmer awareness of KAU bio-control agents in the study area is very very poor. Majority of the respondents (53.4%) apply bio-control agents on weekly basis, rest of the respondents (46.6%) have no specific periodicity in using bio-control agents. Yield (93.3%), Suitability to crops (86.6%) and Cost (70%) are the major (in the order of ranks) are significant factors influencing farmers use of bio-control agents. The data collected reveals that none of the farmers have any brand preference for bio-control agents. All of them are using leaf of neem tree only. No other leaf extract is used by respondent farmers. The study reveals that the sample farmers have not adopted any innovation of there on in the usage of bio-control agents. The sample farmers have, in general, a favourable attitude towards bio-control agents. In other words they feel that use of bio pesticides is difficult than using chemical pesticide, use of bio pesticides is costly and it requires more care and attention. The respondent farmers have very high level of satisfaction on Yield of agricultural products obtained through use of bio pesticides (SI-96%) and Demand for organically produced items (SI-96%). The respondent farmers are highly dissatisfied on Cost of bio-control agents (SI-23.3%).

Poor economic condition of farmers (100%), Lack of support from financial institutions (100%), High capital investment (100%), and High market price (100%) are the major financial constraints faced by the user farmers in adopting bio-control agents. Lack of subsidy (80%) is also a serious financial issue. Lack of awareness about the benefit of bio-control agents (100%), Lack of awareness about bio-control agents available in the market (100%), Lack of awareness about pest control methods (100%) are the major technical constraints. Inadequate availability of bio-control agents (100%), Existence of fake organic vegetables and fruits in the market (100), Lack of information of organic price details (93.3%), and Competition from inorganic products (93.3%) are major marketing constraints faced by almost all the respondent farmers. The Kalady Panchayat provide all the support & facilities to the farmers for improving the use of bio-control agents in this panchayat.



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APPENDIX

APPENDIX



KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF CO-OPERATION, BANKING AND MANAGEMENTS SURVEY
VELLANIKKARA, K. A. U. P. O. THRISSUR- 680656

SURVEY SCHEDULE FOR FARMERS

(FOR ACADEMIC PURPOSE ONLY)

**Topic: Farmer Satisfaction Towards Bio-Control Agents In Kalady Grama Panchayat –
A Case Study of Kalady Grama Panchayat**

SOCIO-ECONOMIC PROFILE

i) Personal Details

Name :

Address :

Age :

Telephone Number :

ii) Farming Details :

1. Details of crops cultivation

Sl.No	Crops

2. Experience in farming (Years)

3. Have you availing any financial support from Government or other institutions?

Yes No

4. If yes, specify.

5. Type of pesticides used for crops?

Chemical Bio pesticide both

iii) Details Regarding The Level Of Awareness

1. Are you aware about the advantages and limitations of using bio pesticides over the chemical pesticides? Yes No

2. If yes, specify.

Advantages	Limitations

3. Are you aware about the following bio pesticides available in the market?

Trichoderma Trichogramma Trichocard Verticillium

Metarhizium Tobacco Deccoation Fruit Trap Pheromones

Neem Cake Pseudomonas Fuserium Neem Oil Emulsion

Cow urine chilli extracts Buveria Kerosene Emulsion

4. From where are you purchasing the bio pesticides required for farming?

Krishibhavan Fertilizer Depot Private Agencies

Home Made From Other Farmers

5. Are you aware about the various schemes undertaken by Kerala Government to increase the use of bio pesticides? Yes No
6. If yes, Specify.
7. What all are the sources through which you are getting the informations regarding agriculture?
 All India Radio Television Krishibhavan
 Newspaper Agricultural Magazine
 Training Class
8. Which of the above sources are you listening, watching and reading continuously?
 Agricultural Magazine All India Radio Television
 Television&Agrl.Magazine Agrl.Magazine&Krishibhavan
9. Are you aware about the various bio-control agents of Kerala Agricultural University, its availability and cost details? Yes No
10. If yes, Specify.
11. Usage pattern of bio pesticides
 Daily Weekly Monthly No specific time
12. What are the major factors influencing the purchase of bio pesticides?
 Price Health Issues Efficiency Availability
 Yield Ease Of Usage Suitability to Crops Suggestion Of
 Farmers Opinion Of Agricultural Officer
13. Do you have any preference towards particular producer/brands of bio pesticides?
 Yes No
14. If yes, Specify
15. Are you using any Botanical extract (Leaf extracts) for controlling pest on crops?
 Yes No
16. If yes, Specify.

17. Did you introduced any new innovative bio pest control measures for controlling the pest on crops? Yes No

18. If yes, Specify.

19. Attitude Of Farmers Towards Bio-control Agents

Sl. No	Statements	HF	F	F/UF	UF	HUF
1	Use of bio pesticides improve the quality of agricultural products					
2	Use of bio pesticides is much easier than using chemical pesticides					
3	Bio pesticides preserves the environment and soil					
4	Use of bio pesticides helps to protect the human and animal health					
5	Use of bio pesticides is a cost effective pest control measures					
6	Use of bio pesticides on the crops helps to control the pests completely.					
7	Demand to the fruits and vegetables cultivated using bio pesticides is high in the market.					
8	Farmer could earn better price for above products in the market					
9	Use of bio pesticides results in the better yield					
10	Use of bio pesticide on the crops require less care and management practice					

HF-Highly Favourable, **F**-Favourable, **F/UN**-Neither Favouarble nor Unfavourable, **U**-Unfavourable, **HU**-Highly Unfavourable

20. Satisfaction Among User Farmers Over The Use Of Bio-Control Agents

Sl. No	Statements	HS	S	NO	DS	HDS
1	Availability					
2	Cost					
3	Effectiveness					
4	Mode of application of bio pesticides					
5	Expenses incurred while adopting bio pesticides for crop protection					
6	Technical assistance from krishibhavan					
7	Assistance from Government / Other Institutions					
8	Yield of agricultural products after using bio pesticides					
9	Technical assistance getting from Kerala Agricultural University					
10	Demand for organically produced items in the market					
11	The shelf life of agricultural products produced by the usage of bio pesticide					
12	Shelf life of Bio pesticides					
13	Subsidies					

HS-Highly Satisfied, S-Satisfied, NO-No Opinion, D-Dissatisfied, HD-Highly Dissatisfied

21. Constraints In Adopting Bio-Control Agents

Sl.No	Reasons	Constraints	Not a Constraint
A) Financial constraints			
1	Poor Economic condition of farmer		
2	Lack of support from financial institutions		
3	Huge capital investment		
4	High market price		
5	Lack of subsidy		
6	High wage cost		
7	High transportation cost		
B) Technical constraint			
1	Lack of awareness about the benefit of bio-control agents		
2	Lack of awareness about bio-control agent available in the market		
3	Lack of awareness about pest control methods		
4	Lack of awareness about preparation of bio-control agents		
5	Lack of classes from krishibhavan		
6	Non-availability of equipments		
7	Duration of storing bio-control agents		
57			

C)Marketing Related Factors

1	Inadequate availability of bio-control agents		
2	Constraints of lack of availability of price details		
3	Existence of preference of fake organic vegetables and fruits in the market		
4	Competition from other products		
5	Distance for bio pesticide product market		
6	Distance for bio pesticide market		



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