# MARKETING OF PLANTING MATERIALS FOR SELECTED COMMERCIAL CROPS IN KERALA

By

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## THESIS

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Kerala Agricultural University

Department of Rural Marketing Management
COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT
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# DECLARATION

I hereby declare that this thesis entitled **"Marketing of planting materials for selected commercial crops in Kerala"** 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, fellowship or other similar title, of any other University or Society.

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## CERTIFICATE

Certified that this thesis entitled **"Marketing of planting materials for selected commercial crops in Kerala"** is a record of research work done independently by Mrs. A. Prema, under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, fellowship or associateship to her.

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*Prema.A.*

Dedicated to the memory of
my father

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# Introduction

# 1. INTRODUCTION

The agricultural sector can fulfill its responsibility of providing food, industrial raw material, and employment only when appropriate measures are taken to promote its development. The 'Green Revolution' of the 'sixties' enabled the country to convert the nightmare "begging bowl" state to that of "self-sufficiency". As a result, the total food grains production increased from a mere 50.8 million tonnes during 1950-51 to 199.9 million tonnes in 1996-97. All this had obviously been possible as a result of the adoption of good quality seeds, enhanced use of fertilizers and plant protection practices besides assured irrigation. Unless quality farm inputs are made available to farmers on a regular basis and at the right time, there is little chance that agricultural production and productivity will move forward (World Bank, 1993).

For efficient farming, it is not only necessary that the various inputs like seeds, irrigation, fertilizer and pesticides are applied at proper time and doses, but equally important is their ready availability within the reach of farmers. This input requirements need to be financed by suitable credit agencies, as most of the Indian farmers are marginal cultivators. If the inputs are not well timed, much of production capacity is lost, apart from the underutilization of land and other productive assets. One of the strong reasons for increased instability in agricultural production in India was due to uncertainty of supply of purchased inputs. According to Hazell (1982), the management of agricultural input delivery system assumed special significance to maintain uninterrupted supply of critical inputs to achieve the targeted national agricultural production and productivity.

It is in this context, that the logistics of these inputs becomes relevant. In an economy that is geared to accelerate industrial development, without efficient and effective distribution of resources, we cannot make full utilization of our limited resources. In order to strengthen the pace of agricultural development, it is imperative to assure an adequate supply of agricultural inputs through an effective marketing

system in rural areas, as agriculture inputs occupy the prominent position in agricultural production.

**Seed production and marketing**

Of the various inputs that contribute to better yield in agriculture, 'seed' is the basic input that holds the key to enhanced farm productivity and, in turn, to production at the state level. Seed is a unique biological input in agriculture, which imbibes in it the productivity potential of the crop. Inputs like fertilizers, pesticides, soil amendments, etc., being expensive, the farmer looks for seed as an answer to many of his problems. Quality seed alone is instrumental in increasing the output by 20 per cent and returns to non-seed part of investment depended significantly on the quality of planting material used (Rao, 1988 b).

Although improved varieties were evolved as a result of research, their seed was not available in required quantities for use by farmers. To overcome this lacuna, the Royal Commission on Agriculture (1928) recommended recruitment of separate staff in the State Department of Agriculture to attend to seed testing and distribution. The Famine Enquiry Commission (1945) and Grow More Food Enquiry Committee (1952) recommended setting up of seed farms with a view to produce required quantities of seed of food crops. Breeder seeds would be multiplied in these seed farms, which would be sold to registered seed growers for further multiplication. As a culmination of the efforts of the Central Government, the National Seeds Corporation (NSC) was established in 1963 with the primary objective of developing a sound seed industry. Marketing of seeds is the most important as well as challenging task of the seed industry because of the nature of the product. Seed/planting material being a living organism, its quality deteriorates faster. As the shelf life is limited, it must be distributed as early as possible. Unfortunately proper attention was not given to this input in early years of planning.

Even though the above-mentioned activities and programmes helped to provide a structure and semblance of a systematic organization, it broke down in

implementation at the field level. The weaknesses of the seed production programme had been brought out by the periodic review of the seed programme made by the Ministry of Agriculture and the Planning Commission from time to time.

The new policy on Seed Development drafted by the Ministry of Agriculture in 1988 highlighted the need for continuous up gradation of seeds/planting materials of various crops to maximize productivity per unit area. Hence, the import of the best potential seed/ planting material available abroad, suitable for Indian agro-climatic conditions, was considered necessary. The new policy also envisaged providing the Indian farmer the best planting materials in the world. The New Policy designated the categories eligible to import seeds/planting materials as i) Departments of Agriculture/Horticulture of the State Governments, State Agriculture Universities and ICAR; ii) Seed producing Indian companies/firms, after registration with the National Seeds Corporation; iii) National Seeds Corporation, State Seeds Corporations; iv) Food processing industrial units; and v) Growers of vegetables and flowers registered with the Director of Agriculture/ Horticulture of the State Governments. The recommendation made by the Expert Group on Seed (1989) was note worthy in this context. The Committee had remarked that there was no arrangement for collection of statistics regarding the share of various agencies, especially in private sector in seed marketing and suggested that professional bodies like Seed Association of India (SAI) should collect information of seed distributed by private and public sector companies and publish them annually.

Various legislations drafted for regulating the quality of seeds included the Seeds Act (1966), the Seeds Rules (1968), the Seeds (Control) Order (1983), Plants, Fruits and Seeds Order (1984), and the Plant Varieties Act (PVA) (1993). But all these legislations and recommendations were drafted for annual crops and seasonal crops like cereals, vegetables, etc., where 'seed' is the propagation unit. The plantation crops sector, which includes rubber, tea, coffee, spices, coconut, arecanut, cashew, etc., remained largely neglected even then.

Although quality seed has been recognized as the trigger point for improving production, economically, seed has not been studied as much as other inputs like fertilizers, pesticides, etc. It was observed that the input supply system in agriculture suffers from serious shortcomings such as higher prices, inadequate supply and delays in supply, inadequate and inconvenient sale points, lack of quality standards, etc. Barring some studies by the National Commission on Agriculture (1976), Jalan (1987), World Bank (1993), Ramamurthy (1998), and Rao (1998 b), not much work had been conducted on the various aspects of seed marketing and majority of the studies were on cereal crops.

The seed production and distribution scenario in Kerala is not much different from that of the national scenario. For cereal crops and pulses an established system of seed multiplication is in vogue in the State, which adopts a four-tier system of Nucleus seed- Breeder seed - Foundation seed and Certified seed production. Nucleus seed is produced in very small quantity directly by the plant breeder that will always have 100 per cent genetic purity. Breeder seed is the further multiplied stock of nucleus seed, produced under the direct supervision of the plant breeder. This also should have 100 per cent genetic purity, minimum 98 per cent physical purity and minimum 80 per cent germination. The Kerala Agricultural University produces the nucleus and breeder seeds. The breeder seeds thus produced are utilized for foundation seed production in the State Seed Farms. It must have at least 99.5 per cent genetic purity, 98 per cent physical purity and minimum 80 per cent germination. The foundation seeds produced in the State seed farms are utilized to produce certified seed in the registered seed plots of farmers. Certified seed is the progeny of foundation seed and is so known because it is certified by a seed certification agency. Certified seed / Registered seed is the ultimate output of seed production chain and the farmers use it for raising their crops. Since there is no seed certification agency in the state, the seed produced from foundation seed is designated as registered /certified seed.

In Kerala, the testing of seeds of rice and vegetables is being carried out at the Seed Testing Laboratory at Regional Agricultural Research Station (RARS), Pattambi under the Kerala Agricultural University and the Seed Testing Laboratory at Alappuzha

under the Department of Agriculture. But all these seed production procedures exist for crops like paddy, pulses and vegetables that are propagated through seeds. For plantation crops and spice crops such well-defined seed production procedures are lacking. Most of the plantation crops and spice crops being vegetatively propagated, it is difficult to set standards for their quality. Performance of such crops depends on the mother plants that have been used for producing the seed/planting material.

Rice, tapioca, coconut, rubber, pepper, coffee, arecanut, cashew, etc., are the major crops grown in the state. Among the non-food crops, plantation crops continued to enjoy a dominant place in the economy of the state. Among these crops, coconut, rubber, cashew and pepper are unique, in that they are the crops closely woven with the economy of the State. Coconut has an important role in the socio-economic life and cultural ethos of the people of the State and has been correctly referred to as 'Kalpavriksha'-'the tree of heaven'. Coconut is the most preferred crop in the State occupying nearly 47 per cent of the net-cropped area. The crop provides income and employment base for lakhs of households with limited land holdings. It also provides ample opportunities for intercropping and mixed farming through systematic efforts on an organized scale.

Next to coconut, rubber has emerged as the crop covering the largest area in Kerala. Area under the crop at the end of 1998-99 was 4.90 lakh ha which accounted for 85 per cent of the area under the crop in the country. Even though the sharp fall in the price of rubber experienced over the last few years had resulted in a decline in the growth of area under cultivation, as a small holder crop, rubber still provides the livelihood security for over 7.5 lakh farm families in Kerala and the rubber economy of the State will remain unaltered forever.

Cashew has become an important agricultural commodity because of its rich potential to contribute to the economy in a variety of ways. Besides being the major foreign exchange earning crop of the State, the employment potential of the cashew industry is equally substantial. The total export earnings from cashew kernels and cashew shell liquid during 1998-99 was Rs. 1613.16 crores and the export of cashew

kernels alone amounted to Rs. 1609.90 crores. There were 21269 workers employed in the factories run by the Kerala State Cashew Development Corporation of which majority of the workers were women belonging to SC/ST community. The total installed capacity of the processing factories stood at 12000 metric tonnes of cashew kernels and our internal production of cashew is hardly sufficient to meet even 20 per cent of the processing requirements (State Planning Board, 1999). Hence there is ample scope for increasing the production and productivity by replanting the senile plantations with high yielding varieties. Cashew occupied an area of 85200 ha in the State during the year 1998-99. Despite considerable investment and efforts, productivity of the crop suffered a set back recording a level as low as 664 kg $ha^{-1}$ in 1998-99, as against 800 kg $ha^{-1}$ in 1995-96.

Performance of pepper has been promising over the last few years. The total value of pepper export from India in the year 1998-99 was to the tune of Rs. 638.11 crores and the area under the crop has increased from 1.80 lakh ha in 1997-98 to 2.31 lakh ha in 1998-99 .The comfortable price situation, which has more or less stabilized over the years, has been acting as the strongest catalyst for expansion in area and there is hectic activity by way of additional plantings in the upper midlands and hilly region. The spurt in area recorded during 1997 to 1999 was in the order of around 50,000 ha (State Planning Board, 1999).

All these crops are small holder crops in Kerala, the average size of operational holding being 0.33 ha only, while the corresponding all India figure is 1.57 ha (Farm Information Bureau, 1999). All the crops mentioned above are involved in the trade and commerce of the State and hence it would be better to consider them as commercial crops. The performance of these crops could be assessed only after 5-6 years, when their juvenile phase is over and they come to stable yield. Moreover, no set quality-standards have been prescribed for vegetative propagules. There is no unanimity in pricing and quality standards. Only the credibility of the organization that produces and markets the seeds/planting materials matters more.

A few organizations like the Kerala Agricultural University, the Department of Agriculture and the Commodity Boards, apart from innumerable private nurseries are involved in the production and distribution of planting materials in the state. During 1998-99, 8.32 lakh coconut seedlings, 70.36 lakh pepper cuttings and 3.17 lakh cashew grafts were distributed through the farms under the Department of Agriculture. (State Planning Board, 1999). In the case of rubber, during 1998-99, about 8.38 lakh of budded grafts had been distributed. (Rubber Board, 1999). But there is no data regarding the share of private sector, which would be much higher than the Government agencies. The Rubber Board has reported that through its nurseries it could cater to 15-20 per cent of the demand for planting materials of rubber, which meant that private nurseries were meeting more than 80 per cent of the demand.

Reports in dailies and magazines showed that even though the State Department of Agriculture with State Seed Farms and District Agricultural Farms in each district and Kerala Agricultural University with farms having nurseries attached to almost all of its Research Stations are there, they were not capable of meeting at least one per cent of the planting material requirement of the State and that the public sector agencies in general were not having any control over price, quality and distribution of planting materials. The planting material production and distribution scenario is beset with a host of problems which need to be analysed both from the producer as well as from the farmer point of view. In many instances the farmer is being exploited with respect to quality and purity of the planting materials.

Hence, this study was undertaken with the following specific objectives:

1. to appraise the marketing practices of various organizations engaged in the marketing of planting materials of selected commercial crops,
2. to examine the source and variety preferences of farmers for planting materials,
3. to study the factors influencing source and variety preferences in relation with relevant marketing-mix elements,
4. to identify the problems and constraints in the marketing of planting materials, and
5. to propose appropriate models for the marketing of planting materials.

**Scope of the study**

The Holy Bible says, "You shall reap what you sow". In a situation where no more land can be brought under plough, not more than 30-40 million hectares can be irrigated in India and fertilizer consumption is also nearing its peak, only two options are left for increasing the yields of crops, namely, high yielding seeds and prevention of wastages and crop losses. The seriousness of the problem of production and distribution of quality seed/planting materials had been highlighted in the Report of the Expert Group on Seed (1989). Moreover, with the introduction of decentralized planning in Kerala, the demand for seeds and planting material has undergone manifold increase. Immediate steps are warranted for capacity building for the production of the required planting materials including quality upgradation of the progeny base (State Planning Board, 1999).

The present study analyses the planting material production and marketing scenario of Kerala. The marketing practices followed by the various sources of planting material viz., the Kerala Agricultural University, the Department of Agriculture, the Commodity Boards and the private nurseries dealing with selected crops have been compared and analysed. The preference of farmers for the various agencies in terms of quality, availability, performance etc. of the planting materials supplied, as well as the preference of the farmers for particular variety of the crop has been studied. The findings of study would be useful for policy formulation relating to the procurement, distribution and marketing of planting material/ seeds of the selected crops.

The study will help in identifying the lacunae in the present system of marketing of planting materials for the selected commercial crops in the State. The marketing models developed from the results and discussions of the study may be used as guidelines in making available the planting materials at the right time, right place and in sufficient quantity to the farmer- consumer.

The Kerala Agricultural University, the State Agricultural Department and the Commodity Boards may use the outcome of the study to realize the shortcomings in the policy and to have a rethinking on their production and marketing strategy. The study may help farmers in choosing quality planting materials from authentic sources. It may

be of immense benefit to researchers in undertaking research activity according to the felt needs of farmers and all those concerned with the development of agriculture in the State.

**Limitations of the Study**

The study itself being a pioneer attempt in the field of seed/planting material marketing, non-availability of sufficient past studies and review has been the major limitation. This study is based on farm level data collected through sample survey. Hence, the main limitation of the study is that farmers do not maintain any basic farm records, as a result of which reliance had to be made on their memory recall. During the survey, relevant information on certain aspects of production and marketing management could not be obtained from some agencies because such information were either not maintained or were considered confidential by them.

The study was conducted with respect to some selected commercial crops alone. Since planning, approach and policies vary from crop to crop, the outcome of the research should be used with care and caution, while stretching the recommendations to other crops.

Another major limitation was that majority of the private nurseries in the sample area were found to be just paper organizations and hence their number had to be limited to whatever was obtainable for each crop. The study involves a lot of concepts and definitions and hence working definitions have been used wherever required relevant to the present study.

**Plan of Work**

The thesis is divided into six chapters including the present introductory chapter. The second chapter contains the review of past studies, relevant to the present investigation. The third chapter outlines the methodology used. This is followed by the presentation of results in the fourth chapter. The discussion of the results in the light of the study is given in the fifth chapter. Chapter six summarizes the findings of the study, followed by references, appendices and an abstract of the thesis.

# Review of Literature

# 2. REVIEW OF LITERATURE

To develop proper comprehension and make generalization from any research, review of past studies in similar lines is a prerequisite. This would enable the researchers to sharpen their thinking, collect relevant information, select appropriate statistical tools and interpret the results in proper perspective. Hence, a review of literature as applicable to the present study has been attempted to facilitate proper conceptualization.

Although a large number of studies relating to marketing of agricultural crops and their produces are available, studies relating to agricultural input marketing especially seed marketing are scanty. Even the little available literature is on aspects of marketing with respect to seeds of field crops like paddy, wheat, cotton, groundnut and vegetables. With regard to marketing of planting materials of plantation crops and tree crops past studies are negligible or rather absent.

## 2.1 Marketing

A large volume of literature on marketing has been published and the term has been defined in different ways by different authors.

Stanton (1984) defined marketing as a total system of business activities designed to plan, price, promote and distribute want satisfying goods and services to potential consumers.

Barker (1989) simplified it as the process of making goods available for consumption. Moreover, he redefined marketing, especially agricultural marketing, as assembly, equalization and distribution of goods and services.

Kotler (1997) defined marketing as a social and managerial process by which individuals and groups would obtain what they need and want through creating and exchanging products and value with others.

In this study, marketing has been conceived as the performance of all those activities that directed the flow of planting materials from those organizations/institutions/firms engaged in production and / or procurement and distribution of planting materials to farmers and other users.

## 2.2 Agricultural input marketing

An appropriate system of inputs includes technical inputs on one hand, and productive inputs like seeds, fertilizers and pesticides on the other. The latter group of inputs can be further classified under (a) seeds and planting materials (b) manure and fertilizers (c) plant protection chemicals (d) irrigation equipments (e) capital (f) labour and (g) training.

A study conducted by NIRD (1981) on Improving Delivery System examined the possible dimensions of delivery systems in the context of rural development. A wide range of variation in operational problems was encountered by the agricultural input delivery systems. The study had identified high price, difficulty in credit availability, untimely and inadequate supply, malpractice/bad quality and transporting problems as the factors that affected the delivery of inputs.

Jalan (1987) observed that a proper delivery of agricultural inputs was essential for the growth of Indian agriculture. The study gave an account of the distribution pattern of agricultural inputs-seeds, fertilizers, pesticides, machinery and implements and credit in the country with special reference to the district of Gorakhpur. The author had stressed the need for close co-ordination between various institutions of seed research and seed growing and distribution agencies. All the inputs should be produced based on their demand and the infrastructure facilities should be expanded in

rural areas also. Farmers should be educated on various channels and uses of inputs and their availability.

Acharya and Agarwal (1994) had emphasized the need for timely supply of farm inputs to the farmers at reasonable prices and the existence of an efficient marketing system for them.

Chamola and Pannu (1995) had observed that since the behaviour of costs and price margins was quite different in the production and marketing of seeds from other agricultural produce, investment in seed industry was much higher. They suggested that a new policy on seed should be announced on the pattern of agricultural output.

Mani and Jose (2000) analysed the performance of agricultural input supply system in Kerala and observed that even after the existence of multiple agencies for distributing agricultural inputs, the farmers were largely dependent on private traders and other non-formal sources for acquiring sufficient inputs in the right time and place. The paper also revealed that even though the Indian agriculture was supported with huge package of subsidies, the advantages of the subsidy was not reaching the farmers in the most appropriate time.

## 2.3 Seed and Seed Marketing

Agarwal (1980) defined seed as a mature ovule consisting of an embryonic plant together with a store of food, all surrounded by a protective coat.

According to Kelley (1992) seed in agriculture can mean in the widest sense any material which is used to plant a crop, which can either be sexually produced seed or vegetative propagating material.

Kumar (1995) while discussing the laws relating to seeds in India, had given that as per the Seed Act, 1966, seed stands for any of the following classes of seeds used for sowing or planting:

1. Seeds of food crops including edible oil seeds and seeds of fruits and vegetables.
2. Cotton Seeds.
3. Seeds of cattle fodder.
4. Jute seeds and includes seedlings, tubers, bulbs, rhizomes, roots, cuttings, all types of grafts and other vegetatively propagated materials of food crops or cattle fodder.

Many researchers had highlighted the importance of seed marketing. According to Douglas (1980) seed marketing included systematic determination of consumer needs, storage of seeds and services to satisfy those needs, communication of information about the availability of seed and services and distribution of seeds to consumers.

In the opinion of Kelley (1992) the use of poor quality seed of a new variety had two major ill effects:

i) The expected improvement in production might not materialize and

ii) The confidence of the farmer being affected adversely jeopardizes the future extension of the use of improved varieties.

Kunal and Murthy (1994) in their market share analysis had indicated that private seed firms and others dominated the seed market in Karnataka with a share of about 67 per cent distribution for pulses and 85 per cent for oil seeds.

Shrestha and Shrestha (1995) discussed the seed production and marketing in Asia and the Pacific and opined that seeds saved by farmers fulfilled more than 95 per cent of the national seed requirement and Government machineries could supply only less than two per cent of the national requirement in Nepal.

Government of Kerala (1997) in its report of Agricultural Infrastructure had mentioned that there was no quality control on the seeds and seedlings distributed particularly from the private nurseries. Encouraging selection and multiplication of seedlings in a decentralized manner involving selected growers for multiplication and distribution of quality planting materials in important growing tracks had been suggested by them.

Mendez (1998) regarded seed marketing as the performance of all those activities that directed the flow of vegetable seeds from the manufacturing firms to the dealers and to the farmers.

Srinivasan (2001) conducted the market share analysis of seeds in Tamil nadu and had reported that in paddy, Government sector dealt with 20 per cent of the volume of paddy seed trade and 77 per cent was met by natural spread from among the farmers. The share of private sector in seed trade was found to be phenomenal particularly in the hybrids of cotton, maize, millets and sunflower.

## 2.4 Consumer / Buyer behaviour

Metha (1974) observed that buying behaviour involved those activities like search for alternatives, evaluation of alternatives, choice decision and post purchase feelings and reactions.

According to Watler and Pacel (1970), consumer behaviour was the process whereby individual decides whether, what, when, how and from whom to purchase goods and services.

Goyal (1986) found that friends played a major role as disseminator of information on purchase behaviour. Advertising and dealer promotion were found as secondary sources of information. About 52 per cent of respondents considered dealers as an influential source.

Sivakumar (1987) in a study on the market structure and buying behaviour of farmers with respect to pesticides opined that buying behaviour was of significant and paramount importance to both buyers and sellers, for the former in satisfying his needs and for the latter in meeting the needs of his buyers and realizing more profit.

Bastine *et. al.* (1988) in an investigation carried out in Kasargod and Kannur districts of Kerala revealed that only 6.51 per cent of the farmers cultivated hybrids along with local varieties. The results also showed that about 81 per cent of the farmers procured seedlings from local agencies and another 16 per cent from Government Agencies. It was also observed that large farmers were interested to produce seedlings in their own farms.

Govindarajan (1989) attempted a linear probability model for analyzing various factors influencing brand loyalty of farmers. The analysis indicated that acclimatization to the brand had the highest contribution. He observed that majority of the farmers were not aware of the different brands of seeds available in the market.

Rajasekharan (1991) analyzed the buying behaviour of farmers in Coimbatore district towards major crop seeds and found that the loyalty towards dealers and brand was more than 80 per cent for cotton and sorghum seed users but only 33 per cent in paddy seed users. High association was observed between price of seeds, seed availability, discount, lack of malpractices and dealer loyalty in the case of paddy.

Kumar (1992) studied the buying behaviour of farmers in Tamilnadu and observed that the buying behaviour of farmers has got significant bearing on the marketing strategy and planning for seed producing firms. Buying behaviour of farmers was studied in terms of dealer loyalty and brand loyalty. He observed that purchase of seeds from private dealers was predominant, followed by Government depots and co-operative stores. Distance to be travelled, quality of seeds purchased and terms of purchase were the factors that influenced the buying behaviour.

John (1993) in a study on the economics of cardamom cultivation in Idukki district has remarked that the supply of cardamom planting materials was from a chain of nurseries run by the erstwhile Cardamom Board spread all over the study area or from own nurseries raised by individual holdings.

Gangadharan (1993) reported that high yielding varieties of pepper were cultivated in 11.4 per cent of the area under pepper in Idukki District. He observed a negative attitude towards Panniyur varieties due to luxuriant vegetative growth under excessive shade and poor performance.

A study on the market potential for hybrid tomato and hybrid bhindi seeds in Karnataka done by Ravichandran (1995) indicated that higher yield, more profit, easy marketing and long shelf life were the important reasons for using hybrid seeds.

Kumar and Nair (1994) while discussing the factors shaping the performance of Kerala's agriculture have pointed out that in the case of coconut, the technological changes in enhancing production has been far from satisfactory and that the cultivators preferred traditional varieties of seedlings to the hybrid ones.

A survey conducted by the Seed Technology Research Unit, National Seed Project, (1996) revealed that about 73 per cent of the farmers were using their own saved seeds, 24 per cent procured seed from other farmers and only three per cent purchased from private seed traders / mill owners.

Mendez (1998) analyzed the buying behaviour of vegetable farmers taking into consideration the extent of use of hybrid seeds, source of purchase, reasons of purchase from a particular source, facilities extended by the source, terms of purchase, source of information on supply of seeds, choice of alternatives in the absence of hybrid seeds, constraints in purchase and expectations about hybrid seeds. The results indicated that availability of the preferred brand; credit facility, customer service and price of the seeds were the factors that influenced the farmers' purchasing behaviour of seeds, in their order of importance.

Reddy and Raju (1999) examined the rural consumer behaviour towards seeds in Warangal district. The study revealed that 34 per cent of the respondents used local seeds and 66 per cent used hybrid seeds for cultivation. The use of hybrid seeds was 100 per cent in sunflower, 96 per cent in cotton, 93 per cent in groundnut and 64 per cent in paddy. The motivating factors behind the purchase of seeds were analysed and found that 53 per cent of sample respondents were purchasing seeds on the basis of quality followed by price (32%) and availability (15%). It was also reported that at times the sample farmers purchased seeds only on the basis of availability, irrespective of quality and price.

## 2.5 Source of information

Gangadharan (1993) in a study conceptualized information source used as the sources through which a farmer obtained information on improved agricultural practices of crops under study.

Ravichandran (1995) studied the market potential for hybrid tomato and hybrid bhindi seeds in Karnataka, and indicated that dealers followed by fellow farmers were the important sources of information for purchase of seeds.

Mendez (1998) in a study on market potential for hybrid vegetables in Nilgiris observed that dealers were the major source of information followed by friends and relatives. The Horticultural Department staff occupied the third position as source of information.

The major weakness in the rice seed delivery system of Andhra Pradesh was identified by Pal *et.al.*(2000) as inefficiency in the delivery of seeds of new varieties and insufficient information about them to farmers.

## 2.6 Marketing practices

Chetty (1971) while studying the different aspects of pricing of seeds had remarked that many factors affected the rate of growth and expansion of the seed industry in India. He ascertained that evolution of superior crop varieties, trained technicians to supervise the seed multiplication process, quality conscious producers who can devotedly attend to multiplication of new varieties, availability of efficient seed processing equipments, scientific processing, storage and distribution centres, accurate seed testing facilities and a sound marketing system were essential for the steady growth of seed industry.

Rajasekaharan (1991) observed in a comparative study of seed marketing firms in Coimbatore district that 83 per cent of the respondent firms resorted to promotional activities like pamphlets, cinema slides and newspaper advertisements.

Kunal and Murthy (1994) in a market share analysis had indicated that private seed firms and others dominated the seed market in Karnataka with a share of about 67 per cent distribution of pulses and 85 per cent of oil seed crops.

Singh and Asokan (1997) compared the seed production process and its management in the private sector, co-operative sector and the public sector. While the public sector enterprise undertook only production and distribution of seeds of a wide range of crops like cotton, castor, bajra, paddy and wheat, the private sector company had a strong research base and the main aim of the company was "to create and supply quality seeds through genetic research". Private companies assessed the demand for seed for the ensuing years and planned their production accordingly. In co-operative enterprises, production of seed potato alone was the main activity and they marketed 80 per cent of the seed potato through dealers, 10 per cent through the Government department and the remaining 10 per cent through the co-operatives.

Almekinders and Boef (1999) observed that 80 per cent of the seed used in developing countries were farm produced and on–farm production of seeds and farmer–

to-farmer seed exchange were the most important means of seed supply in many countries.

Karshakasree (2001) published a report on the seed sector in Kerala with special reference to State Agricultural Department farms, Kerala Agricultural University and other agricultural research centres. It was observed that the seed industry in the state was not performing well. Although breeder seed materials are being produced in the research stations of Kerala Agricultural University and ICAR, functioning of the State Department of Agriculture was not satisfactory. The unutilized parts of the University campus could be utilized for planting material and seedling production and made available to the farmers through the Sales-cum-information counters.

A study on appropriate packing material for transporting mango grafts using gunny bags, sphagnum moss and saw dust conducted by Kshirsagar *et. al.* (2001) showed that mango grafts transported with pruned leaves and roots treated with sphagnum moss planted after seven days in field showed 80 per cent survival.

## 2.7 Problems and constraints in seed marketing

Tripathy *et al.*(1982) while analyzing the constraints in the adoption of high yielding rice varieties and technologies reported that poor germination per centage of Government supplied seeds and insufficient demonstration of improved techniques were the main hurdles faced by farmers.

Pillai and Prasad (1983) while discussing agriculture among the Tribes of Parambikulam, observed that non-availability of good quality seeds and seedlings followed by lack of technical guidance on improved farming and low price of the produce were the major problems in farming.

Prasannan (1987) reported non- availability of inputs including planting materials in time as one of the major constraints in the adoption of recommended coconut cultivation practices.

John (1993) reported that even though the erstwhile Cardamom Board supplied the planting materials through its approved nurseries, planting materials of high yielding clones suited to micro – agro climate of the different zones of the district were not available in the board nurseries or in private nurseries. He suggested the use of agro climatically suitable varieties as an important aspect in boosting cardamom production.

Ravichandran (1995) studied the market potential for hybrid tomato and hybrid bhindi seeds in Karnataka, and indicated that high cost of hybrid seed was the major constraint experienced by the farmers followed by non-availability of hybrid seeds in their location.

Mendez (1998) observed that the major problem identified by the dealers in marketing of seeds was the belayed repayment of credit extended to buyers. Other problems were strict seed inspection laws, quality deterioration, non-availability at the required time, poor quality and low-grade packaging. Non-adoption of proper and timely promotional methods by the companies was another problem stated by the dealers.

Balasubramanian (1998 a) discussed the salient features of input support in the Nineth Plan and suggested that the concerned states should form Pricing Committees to fix fair price for cashew grafts being produced by various agencies in the state. Procurement of grafts from any source should be made after physical verification of the plants available in the nursery by the authorities.

Reddy and Raju (1999) examined the problems with regard to marketing of seeds of major crops in Andhra Pradesh and found that charging higher prices ranked

first, followed by supply of poor quality seed materials. Insufficient and irregular supply and adulteration were the other problems.

Thomas (2000) in a study on the problems and prospects of medicinal plants cultivation had remarked that the respondents considered non-availability of genuine planting materials (88%) and lack of new variety (83%) as the main problems. The study highlighted the need for standardizing micro propagation techniques for medicinal plants.

Srinivasan (2001) analysed the problems in getting quality seeds faced by the seed user farmers in Tamil nadu and found that among the 727 respondents, 16 per cent were of the view that quality of seeds supplied by all the agencies was invariably low/ poor. The problem of high price of seeds was expressed by 13 per cent of the user farmers. Scarcities of seeds in general and non- availability in time were the other problems associated with seed distribution.

The review of literature point out that majority of the studies on seed/planting material marketing pertained to cereal/field crops and vegetables and had been conducted in states other than Kerala. The study of marketing practices of organizations indicated that excepting some private seed companies, others were not resorting to promotional activities. The problems and constraints also pertained to seeds of field crops which when compared to planting materials of plantation crops were less bulky and more viable. Although, Kerala state is a major producer and exporter of many commercial crops, the input marketing side of these crops was not reported. Only the economics of production and marketing of the produce had been attempted in many of the studies. Hence, the dearth of literature on the marketing of planting materials of the crops may be viewed as a limitation.

# Methodology

# 3. METHODOLOGY

The present study is a field enquiry into the marketing of planting materials both from the producer's as well as the consumer's point of view. The rationale of such an exercise arises from the assumption that the results would provide some guidelines on production, selection and marketing of planting materials. This chapter provides the analytical framework for the conceptualized research problem. The methods and tools of analysis adopted in examining the source and variety preferences of farmers for planting materials; factors influencing such preferences and the problems and constraints encountered in marketing of planting materials are covered here. The study was conducted on the marketing of planting materials in respect of four major commercial crops in Kerala.

## 3.1 Conceptual exposition and operational definitions

The study uses various terms and concepts to analyse the objectives. They are briefly explained below:

### 3.1.1 Marketing

Marketing has been conceived as the performance of all those activities that direct the flow of planting materials from the organizations/institutions/firms engaged in the production and distribution of planting materials to farmers.

### 3.1.2 Commercial crops

Crops have been classified into several classes according to the range of cultivation, place of origin and distribution, different characters, uses, cultivation requirement and other common behaviour. Accordingly, crop plants that are permanent in nature i.e., harvesting continues for a prolonged period from a single planting are grouped as Plantation crops, for instance tea, coffee and cocoa. Yet another classification, the commercial classification, groups crop plants as food crops, feed crops, industrial or commercial crops and food adjuncts. (De, G.C.1990).

But this classification is not suitable to the Kerala conditions, where 70 per cent of the holdings are below the size of two hectares. Here most of the crops, viz., coconut, arecanut, coffee, pepper, tea, cashew, cardamom and rubber are grown in the homesteads as subsistence crops. These crops that are grown as subsistence crops and which earn for the daily survival of a household have been defined as commercial crops in the Kerala context. Almost all the plantation crops and coconut fall under the division of commercial crops. Coconut, arecanut, coffee, pepper, tea, cashew, cardamom and rubber are some of the major crops of commercial importance grown in Kerala.

For the purpose of the study four major crops of commercial importance to Kerala viz., coconut, rubber, cashew and pepper were selected.

### 3.1.3 Organization

Organization means the place where some economic process/activity has been carried on. The organizations involved in the context of the present study are private nurseries, Kerala Agricultural University Farms, Seed Farms / District Agricultural farms of the State Department of Agriculture and Commodity Boards like the Rubber Board, the Coconut Development Board and the Spices Board.

### 3.1.4 Marketing mix

It refers to the set of controllable marketing tools – product, price, physical distribution and promotion – that the firm blends to produce the response it wants in the target market.

### 3.1.5 Product

Product is anything that can be offered to a market for attention, acquisition, use or consumption that might satisfy a want or need. (Kolter and Armstrong, 1996). Product here means planting materials of the crops produced by the organizations for distribution and sales.

### 3.1.6 Price

The amount of money charged by the producer organization for a product or service. Price in this context is the money charged for the planting materials by the agencies producing them.

### 3.1.7 Breakeven pricing

Breakeven pricing is defined as setting price to breakeven on the cost of making and marketing a product (Kotler and Armstrong, 1996). Here, it is defined as the price to be fixed so as to breakeven on the cost of production of the planting materials.

### 3.1.8 Cost – plus pricing

Cost – plus pricing is a pricing method where the price of the product is fixed by adding a standard markup to the cost of the product (Kotler and Armstrong, 1996). For this study, the price of the planting material in this approach is considered as the price obtained by adding a reasonable margin to the cost incurred in the production of planting material.

### 3.1.9 Channels of distribution

Channels of distribution are the routes through which produce or products move from producers to consumers. In this context, channels of distribution connotes the different agencies, outlets through which the seeds and planting materials produced in the farms of the various agencies reach the ultimate consumer, the farmer.

### 3.1.10 Promotion

All the efforts put up by the agencies which produce and distribute planting materials of the cultivated crops to present for farmer acceptance through advertising, personal selling, sales promotion and public relations.

### 3.1.11 Planting materials

Seeds and planting materials are the units of propagation. In the case of field crops like paddy, wheat, pulses, etc., seeds are the propagating materials. But plantation crops and tree crops like coconut, arecanut, rubber, tea, coffee, cashew, etc., are propagated through seedlings or other vegetative parts.

For this study, planting material connotes all sorts of plant parts used for propagation viz., seedlings, cuttings, grafts and buds.

### 3.1.12 Cultivar / Variety

Anonymous (1980) defined a cultivar (variety) as an assemblage of cultivated plants which was clearly distinguished by any characters (morphological, physiological, cytological, chemical, or others) and which when reproduced (sexually or asexually) retained its distinguishing characters.

### 3.1.13 Awareness

Lionberger (1960) defined awareness as the first knowledge about a new idea, product or practice. In this study awareness was operationally defined as the respondent farmers' state of having knowledge of one or more varieties/cultivars of the selected crops.

### 3.1.14 Quality

Quality is an inherent feature of an entity, which explains its performance. Here quality means the inherent capacity of planting materials to give the desired performance in terms of better yield, disease and pest tolerance and stress tolerance.

### 3.1.15 Quality indicators

Those external attributes of the planting material that indirectly tell about the quality and performance of a crop and which aid in selection of quality planting material have been operationalised as quality indicators for the study.

### 3.1.16 Local availability

Local availability means availability at the premises of the farmer's plot or his dwelling place. Here availability within the panchayat area has been considered.

### 3.1.17 Confirmed availability

Confirmed availability means assurance about the availability of a particular variety / cultivar of a crop from a source.

### 3.1.18 Buying behaviour

Walters (1974) defined buying behaviour as the process wherein individuals, decide on what, when, where, how and from whom to purchase goods and services.

For the present study, buying behaviour is analysed taking into consideration the source of purchase, reasons for purchase from a particular source, facilities extended by the source, source of information on the supply of planting materials and constraints encountered in the purchase of planting materials.

### 3.1.19 Constraints

Pandya and Trivedi (1988) defined constraints as those items or difficulties or problems faced by individuals in the adoption of technology. In this study, constraints have been defined as the difficulties/problems experienced by farmers in getting quality planting materials from the source.

## 3.2 Study Period

The field investigation for the study was carried out during the months from April to August 2000. The planting season in the state for major crops coincides with the onset of monsoon rains. Hence the study was conducted during that period, when the farmers were preparing themselves for undertaking new planting of crops and the sales volume of the nurseries was the highest.

## 3.3 Sampling Procedure

A four stage random sampling procedure was adopted for sample selection. Kerala state consists of 14 districts where almost all the crops are grown. The distribution of the crops was not uniform in all the districts as the crops selected for the study varied in the nature of growth and habit. So, to have a realistic estimation, the district having the maximum area under each crop was selected purposively for the study. The districts selected were Kozhikode for coconut, Kottayam for rubber, Idukki for pepper and Kannur for cashew. From each selected district, one block having the maximum area under the crop was again selected purposively. The list of panchayats under each block was prepared and two panchayats were selected randomly. The selected panchayats were treated as one single unit for the purpose of selection of the farmer-respondents. Thus, 75 farmers were selected randomly under each crop for studying their preference for varieties, sources and other issues related to the marketing of planting materials of coconut, rubber, pepper and cashew as the case may be.

## 3.4 Study Area

The trend in area under various crops in the state during the last few years revealed that the surge for replacing seasonal and annual crops by perennial crops is persisting. The district-wise area under the crops selected for the study, coconut, rubber, cashew and pepper is given in Table 1 and their distribution in the state are presented respectively in Fig 1,2,3 & 4.

### 3.4.1 Coconut

Coconut is the most preferred crop in Kerala occupying nearly 47 per cent of the net-cropped area. Coconut also called the *Kalpavriksha* had performed well in the first two years of the Ninth Five Year Plan period with both area and productivity of the crop recording impressive growth. Among the districts, Kozhikode has the maximum

Table .1 District wise area under the selected crops in Kerala for the year 1996-1997

(in hectares)

| District | Crops | | | |
|---|---|---|---|---|
| | Coconut | Rubber | Cashew | Pepper |
| Thiruvananthapuram | 89,028 (9.87) | 25,995 (5.79) | 2,411 (2.48) | 5,171 (2.83) |
| Kollam | 79,374 (8.80) | 35,347 (7.87) | 5,565 (5.73) | 8,663 (4.74) |
| Pathanamthitta | 23,346 (2.59) | 47,063 (10.48) | 1,215 (1.25) | 4,235 (2.32) |
| Alappuzha | 63,852 (7.08) | 3,573 (0.8) | 5,931 (6.11) | 1,739 (0.95) |
| Kottayam | 39,603 (4.39) | **1,09,582 (24.41)** | 700 (0.72) | 8,219 (4.49) |
| Idukki | 19,261 (2.14) | 37,240 (8.29) | 1,006 (1.04) | **47,712 (26.09)** |
| Ernakulam | 65,925 (7.31) | 55,247 (12.30) | 1,254 (1.29) | 5,837 (3.19) |
| Thrissur | 83,978 (9.31) | 12,254 (2.73) | 4,309 (4.44) | 4,343 (2.37) |
| Palakkad | 46,037 (5.10) | 26,031 (5.8) | 5,749 (5.92) | 4,073 (2.23) |
| Malappuram | 1,03,924 (11.52) | 26,305 (5.86) | 10,761 (11.08) | 8,193 (4.48) |
| Kozhikkode | **1,24,584 (13.81)** | 17,949 (4.0) | 3,725 (3.84) | 10,302 (5.63) |
| Wayanad | 8,930 (0.99) | 5,302 (1.18) | 1,025 (1.06) | 39,605 (21.66) |
| Kannur | 98,630 (10.93) | 28,420 (6.33) | **29,780 (30.67)** | 30,148 (16.48) |
| Kasargod | 55,632 (6.17) | 19,280 (4.29) | 23,658 (24.37) | 4,647 (2.54) |
| State | 9,02,104 (100) | 4,48,988 (100) | 97,089 (100) | 1,82,887 (100) |

Source : Farm Information Bureau, 1999

Note: Figures in parentheses show percentage to total

area under coconut accounting for 14 per cent (1,24,584 ha) of the total area under coconut in the state. Hence, Kozhikode district was selected as the study area. The district has 12 blocks, out of which Balussery block (17,708 ha) was selected being the one with the maximum area under coconut. Two panchayats viz., Panangad and Koorachundu were then randomly selected to study the farmers' preference for sources supplying coconut seedlings and the various aspects of marketing of coconut seedlings.

### 3.4.2 Rubber

Kerala accounts for 85 per cent of the area under rubber in the country (5.58 lakh ha). The coverage under the crop in the state during 1996-1997 was 4.37 lakh ha Being predominantly a small- holder plantation crop in the state, the average size of a rubber holding is only 0.47 ha (State Planning Board, 1999). Among the rubber growing districts, Kottayam accounts for the maximum area under rubber cultivation in the state. Rubber occupies an area of 1,09,582 ha in Kottayam. Out of the 11 blocks in the district, Erattupetta block, having the maximum area (20,919 ha) under rubber was selected. From Erattupetta block, Thalanadu and Erattupetta Panchayats were randomly selected for studying the farmers' preference and other issues related to marketing of planting materials of rubber.

### 3.4.3 Cashew

Cashew is extensively cultivated in the districts of Kannur, Kasargod, Malappuram and Kollam. Out of the 97089 hectares under cashew in Kerala, 29,780 ha (31%) are in Kannur district. There are nine blocks in Kannur, and Irikkur block has the maximum area under cashew (12,336 ha) as per the Panchayat Level Statistics of the Government of Kerala, 1996. From Irikkur block, Payyavur and Padiyur – Kalliyad Panchayats were randomly selected for studying the farmers' preference for cashew varieties and various aspects of marketing of planting materials of cashew.

### 3.4.4 Pepper

Kerala state enjoys a near monopoly in area and production of pepper, accounting for 97 per cent of the production in the country. Pepper occupies an area of

**Fig. 1. Distribution of area under coconut in Kerala**

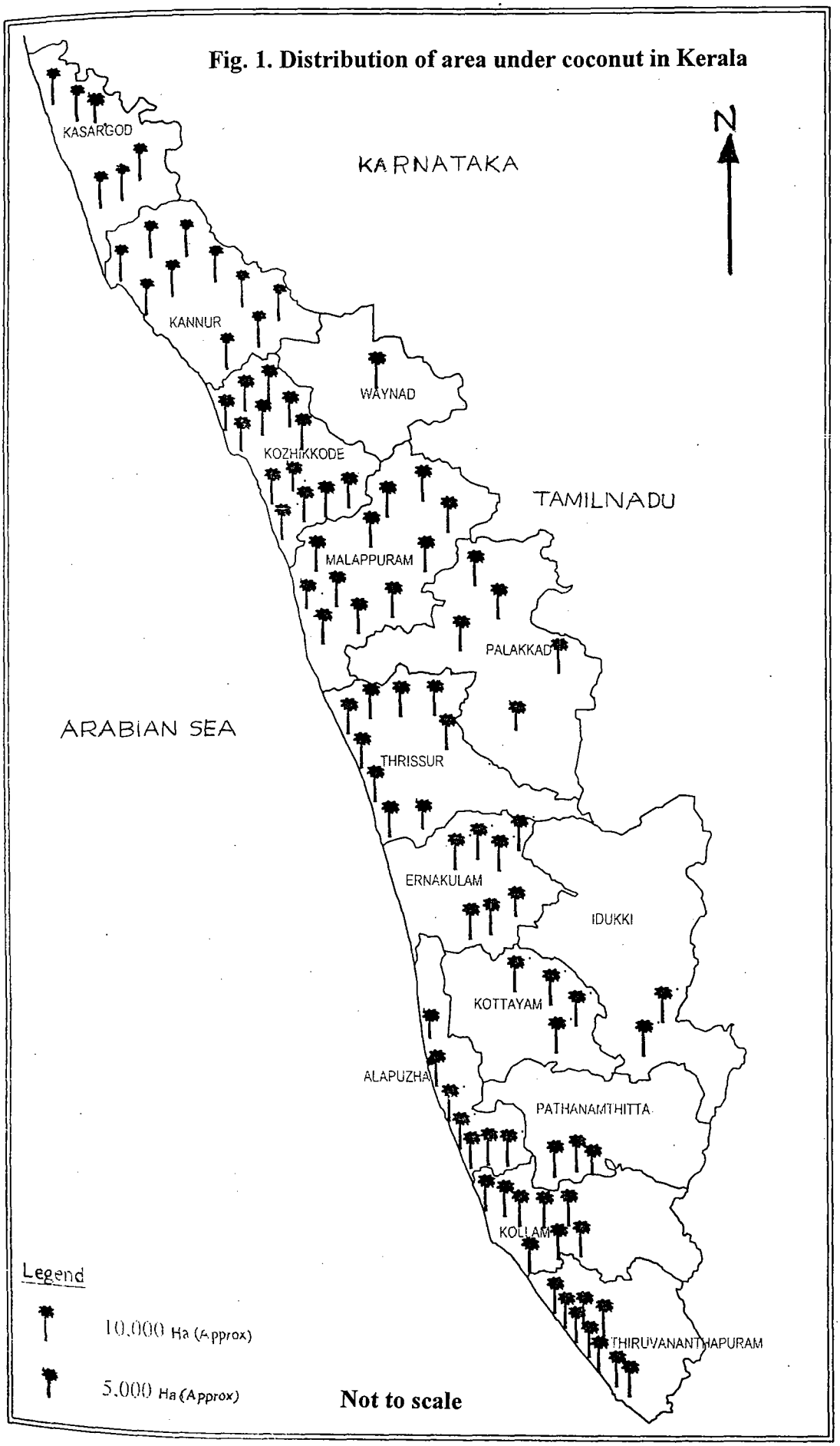


**Fig. 2. Distribution of area under rubber in Kerala**

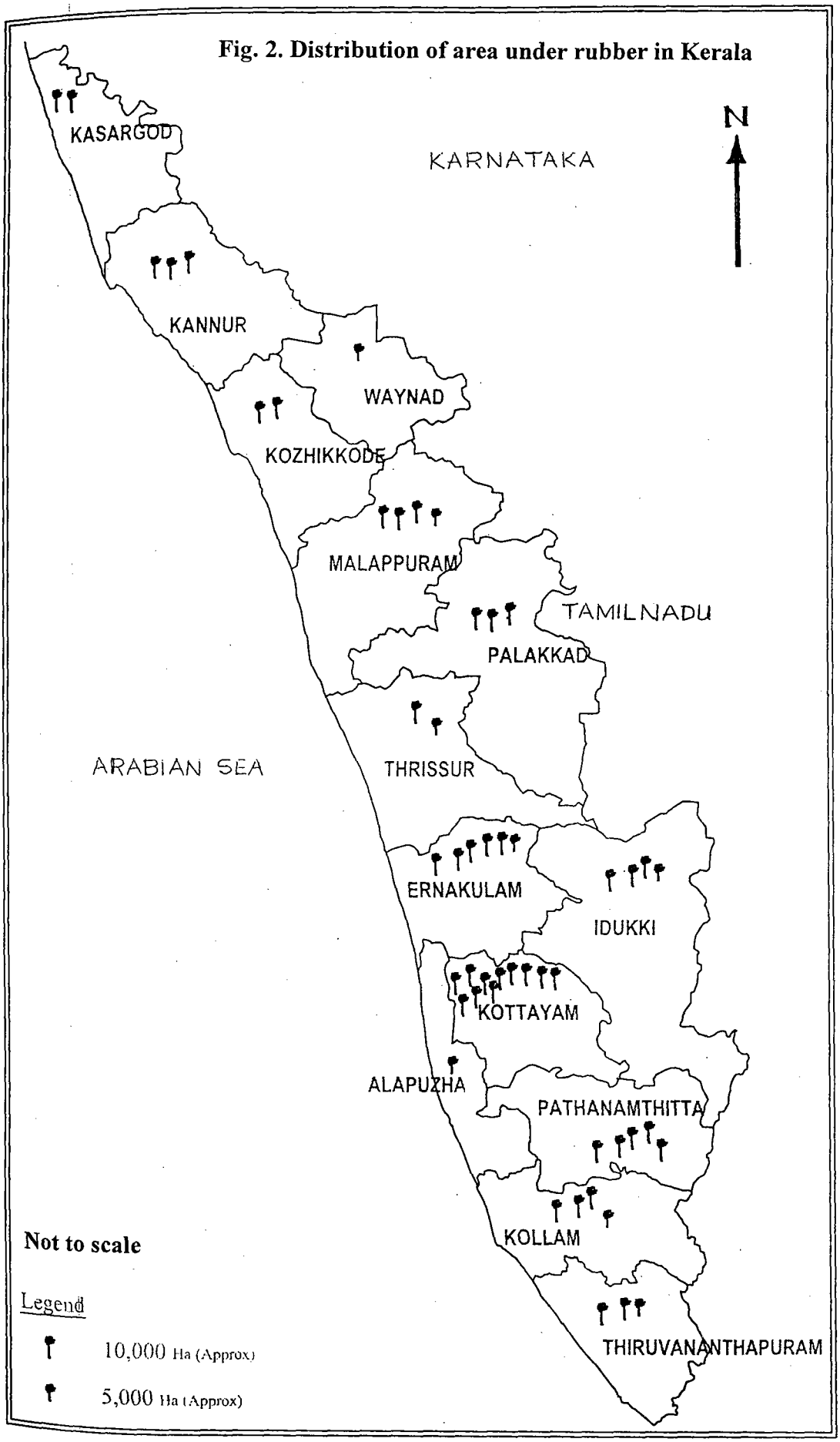


**Fig. 3. Distribution of area under cashew in Kerala**

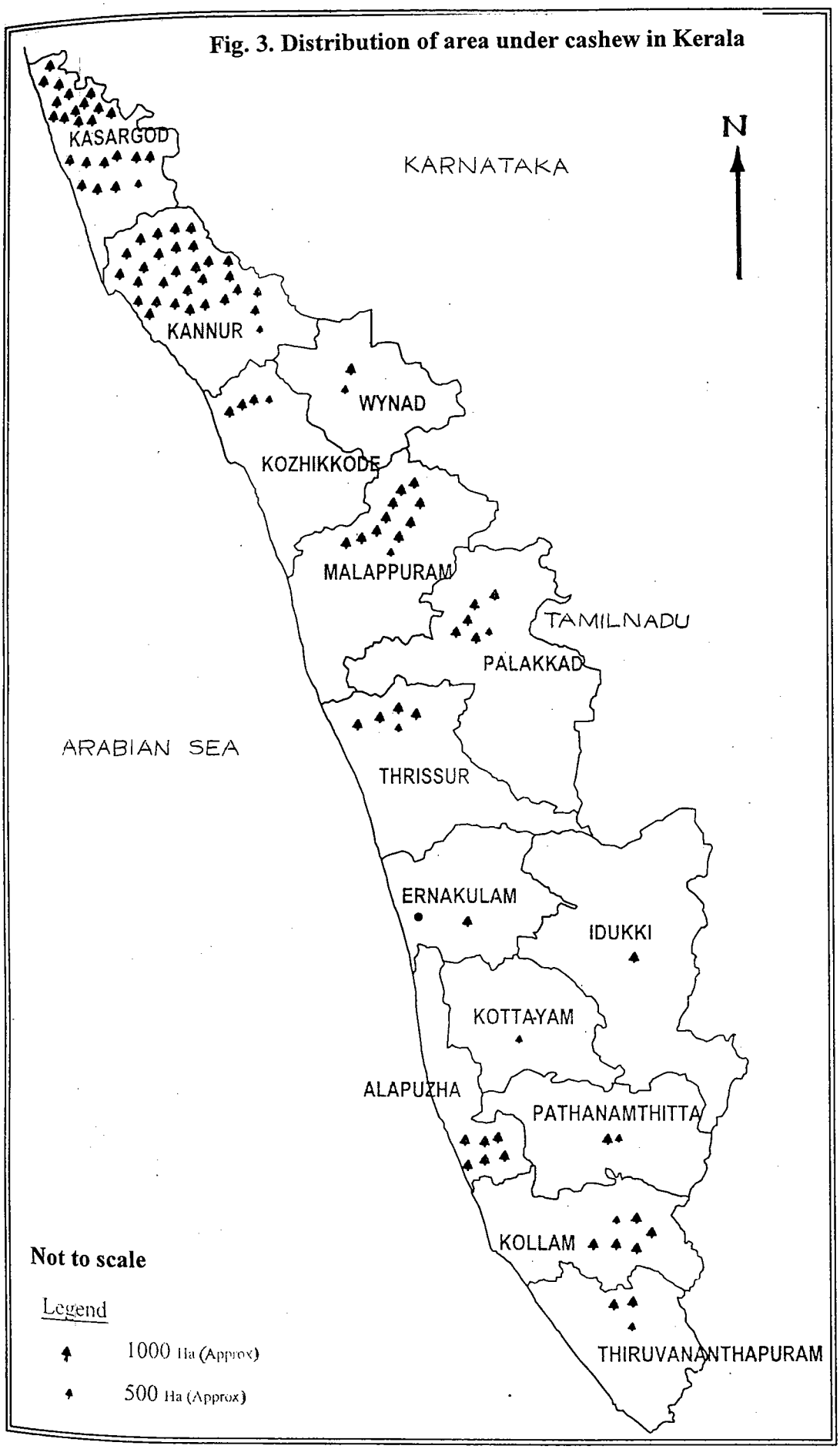
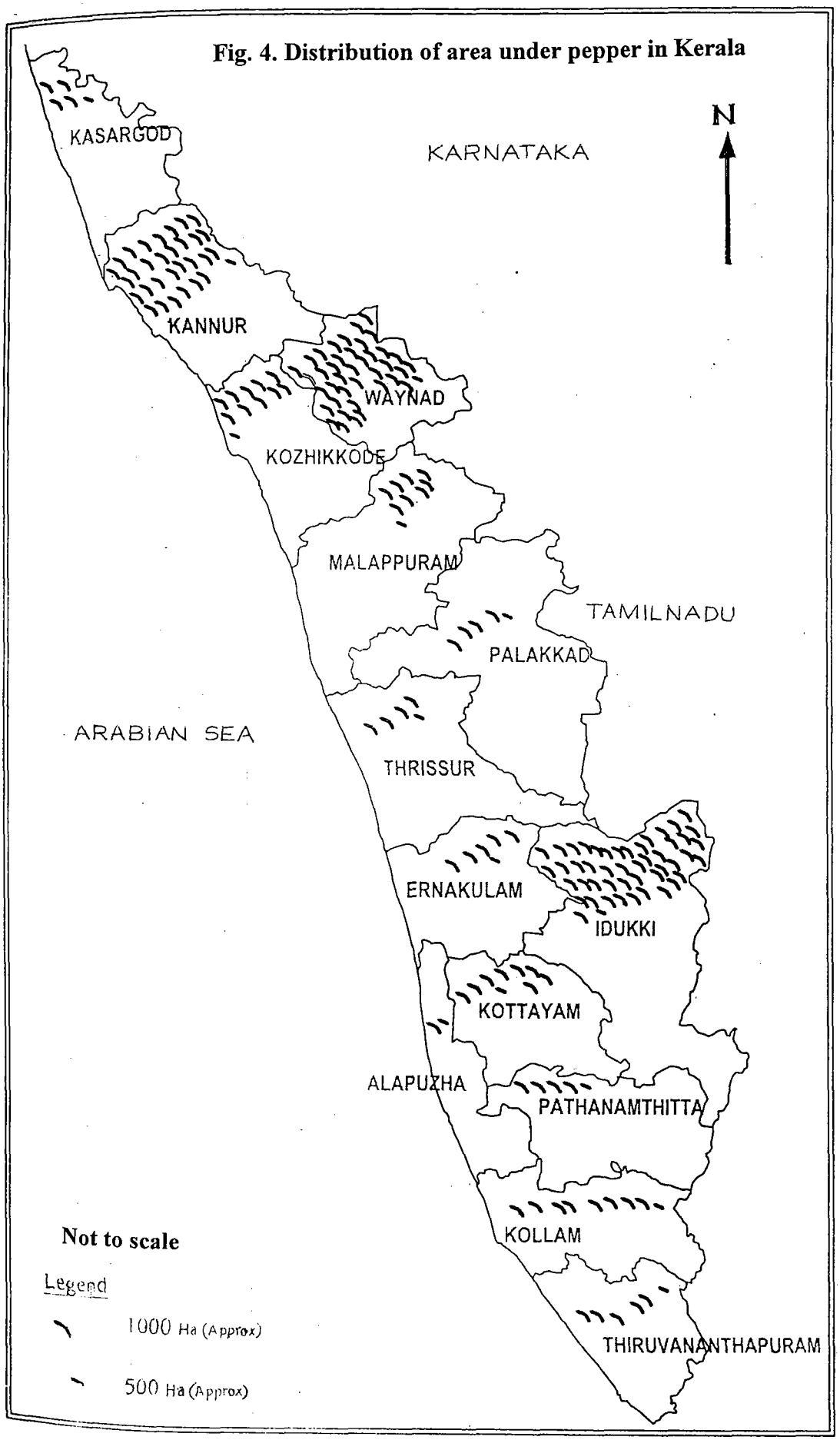


**Fig. 4. Distribution of area under pepper in Kerala**



1,82,887 ha in the state. About 26 per cent of the total area under pepper in Kerala is in the Idukki district accounting for an area of 47,712 ha (State Planning Board, 1999). The economy of Idukki is predominantly agricultural with commercial crops like, cardamom, tea, pepper, coffee, rubber, ginger and vegetables. Out of the eight blocks in Idukki, Kattappana block is having the maximum area (16,443 ha) under pepper. Two panchayats viz., Vandanmedu and Kattappana in the Kattappana block were then randomly selected for studying the farmers' preference for varieties, sources and other aspects of marketing of planting materials of pepper.

The map showing the location of the study area is given in Fig 5.

### 3.5 Data collection from Organization/Institution

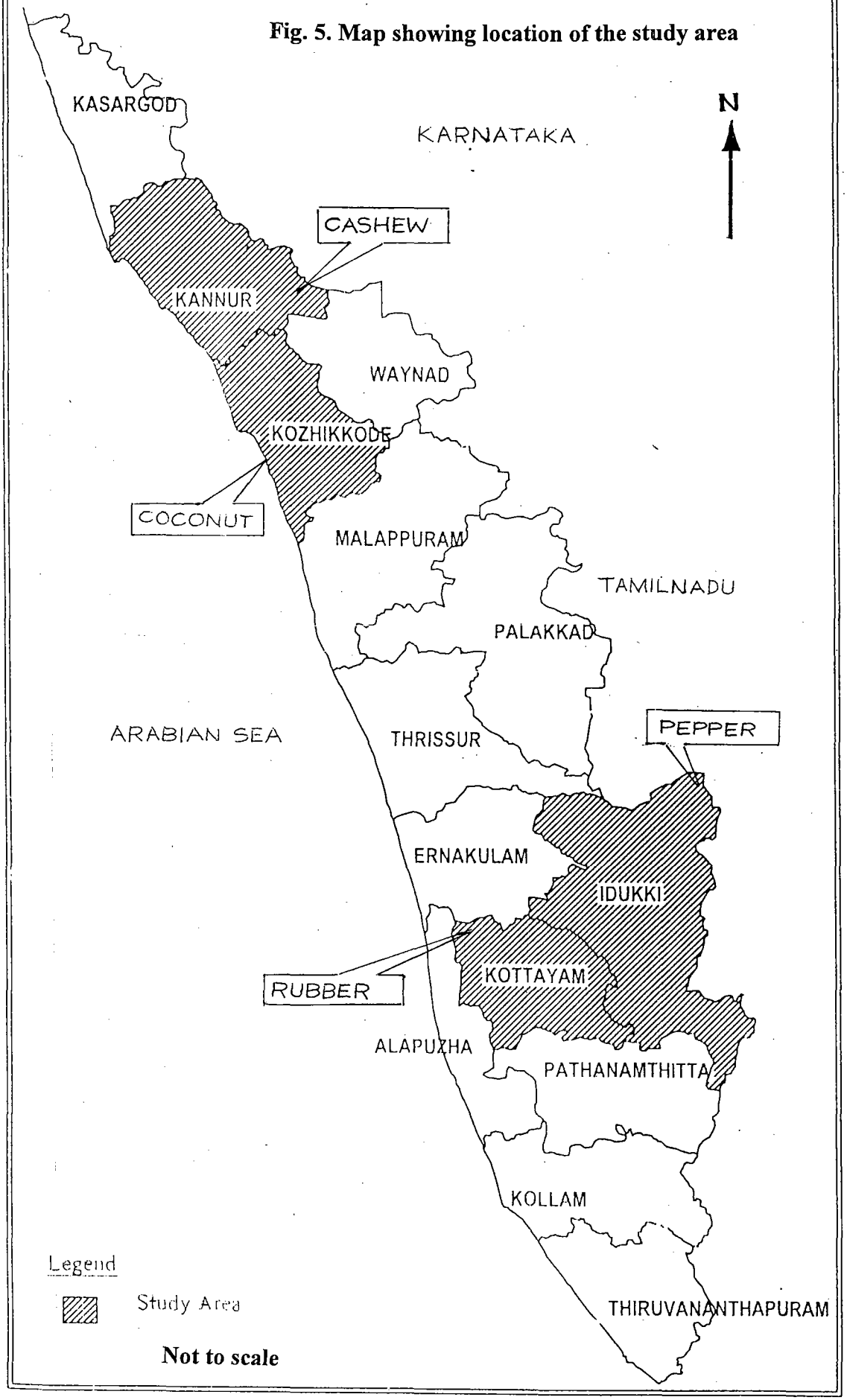
Seeds and planting materials are being produced and distributed in the State by Government agencies, Private nurseries and farmers. The address of the agencies in the selected districts was collected by sending a proforma drafted for the purpose to the Agricultural Officers in the selected blocks.

All the farms under the Kerala Agricultural University and the Department of Agriculture in the districts under study and the private nurseries in the selected blocks were surveyed as part of the study. The list of farms and nurseries in the Government sector in the selected districts is given in Appendix IV. The required information from the organizations was collected using structured interview schedules. (Appendix -I).

### 3.6 Data collection from farmers

For each crop 75 farmers were randomly selected from the study area thus making a total sample of 300 respondents. The list of farmers in the selected panchayats was obtained from the Krishi Bhavans concerned and 75 respondents were randomly selected from the list. A pre-tested structured interview schedule was used for eliciting the required information from the farmers. (Appendix- II)

**Fig. 5. Map showing location of the study area**



## 3.7 Method of Analysis

Bivariate tables, Percentages, Index numbers and Path Coefficient analysis were used for analyzing the data.

### 3.7.1 Farmers' preference to sources

Sabarathnam and Vennila (1996) used a Rank Based Quotient (RBQ) to prioritize the technological needs and problems that the farmers faced with regard to crop pests.

In the present study, to prioritize and quantify the preference of farmers to the sources supplying quality-planting materials, the Rank Based Quotient (RBQ) was used.

$$RBQ_j = \frac{\sum_{i=1}^{n} (Fi)(n+1-i)}{Nn} \times 100$$

where ,

Fi – Frequency of farmers for i $^{th}$ rank of j $^{th}$ source

N – Number of farmers

n – Number of sources

The farmers were asked to rank each source based on their preference for purchasing planting materials of the selected crop. The RBQ for each source was calculated using the formula given above.

### 3.7.2 Parameters that influence source preference

Farmer's preference to a source was judged based on some well-defined criteria like preferred variety, quality, credibility of the source, local availability, affordable price and confirmed availability. An index was worked out to rank the factors in the order of importance and also to measure the degree of importance.

Respondents were asked to prioritize the sources by assigning marks out of 10 for each criterion. The individual scores so assigned for each factor was added up to get the aggregate score of that factor. The aggregate score obtained by each factor was then expressed as a per centage of the maximum aggregate score obtainable by an individual factor. The maximum aggregate score would be the numerical product of the number of factors to be ranked, and the number of respondents applicable in the particular case.

$$Cx_i = \frac{\sum_{i=1}^{n} Es_i}{Nn} \times 100$$

where ,

$Cx_i$ – Criterion index value of factor $x_i$

Esi – Aggregate score obtained by factor $x_i$

n – Number of factors

N – Number of respondents

Path Analysis

A Path Coefficient analysis developed by Wright (1921) and followed by Singh and Chowdhary (1977) was employed to find out the direct and indirect effect of the criteria influencing the farmers' preference to source. This also gives the relative contribution of the selected variables towards farmers' preference to source.

The analysis was performed using the SPAR1 package developed at IASRI, New Delhi available at the Central Computer Facility, College of Horticulture.

3.7.3 Awareness about varieties/cultivars

A frequency index of awareness about the varieties termed as 'Awareness factor' was developed for facilitating the analysis. The respondent farmers were asked to indicate their awareness about a variety on a three-point scale viz., 'aware', 'somewhat aware' and 'not at all aware', with weights 2, 1 and 0 respectively. Based on this, the awareness factor was calculated using the following formula:

$$K_x = \frac{\sum_{i=1}^{k} K_{ix}}{\sum_{i=1}^{k} K_{ix}\,Max} \times 100$$

where,

$K_x$ - Awareness factor about variety x.

$K_{ix}$ - The response score of individual i, showing frequency of awareness about variety x.

$K_{ix}$ Max - The maximum score obtainable by variety x from Individual i.

K - The relevant number of respondents from the sample.

The frequency distribution of the farmers based on awareness about the varieties/cultivars of the selected crops was calculated as below:

The total awareness score for each respondent was obtained by summing up all the individual scores on awareness about the popular cultivars/variety of the selected crop. The individual score was subjected to per centage analysis and the respondents were categorized in to three strata, based on the per centage of scores obtained. The strata were: (1) Below 33 (2) Between 33and 67 and (3) Above 67, which represented 'low', 'moderate' and 'high' level of awareness respectively.

A $\chi^2$ analysis was done to determine the difference in the awareness level among the three strata of respondents.

### 3.7.4 Quality indicators of planting material

The indicators or criteria for selecting planting materials for each crop were listed out. Farmers were asked to rank each criterion according to their perceived importance. Rank Based Quotient (RBQ) was calculated for each indicator to facilitate easy inference.

### 3.7.5 Media giving information about source

Percentage analysis was done to know the extent of use of various media giving information about planting materials.

A frequency index was constructed as in 3.7.3 by directing the respondent farmers to indicate the timeliness of the information they received from the source. Responses were collected on a three-point scale - 'often', 'occasionally' and 'rarely', with weights 2, 1 and 0 respectively. Based on this, the frequency index of timely information was constructed.

The adequacy of information from the sources was obtained from the farmers in dichotomous response and was subjected to percentage analysis.

### 3.7.6 Problems and constraints experienced by farmers

Based on discussions with farmers, scientists and extension officers, various constraints experienced by farmers in getting good quality planting material were enlisted. Percentage analysis was carried out to facilitate easy comprehension.

### 3.7.7 Marketing practices of organizations

To explain the practices followed by the various organizations in the marketing of planting materials, descriptive approach was mainly resorted to. Wherever possible per centage analysis was done to make inferences. As far as Kerala conditions were considered, the major agencies involved in the marketing of planting materials were Government agencies, private agencies and individual farmers. Kerala Agricultural University (KAU), District Agricultural Farms (DAF) and State Seed Farms (SSF) under the Department of Agriculture and the nurseries maintained by the Commodity Boards constituted the Government agencies. Private agencies included the private nurseries located in the study area owned and managed by sole proprietors.

## 3.8 Planting materials of crops selected

Planting materials commonly used and popular among the farmers in the case of the selected crops are given below:

### 3.8.1 Coconut

a) Varieties and cultivars

Seedlings raised from quality seed nuts are the most popular planting material for coconut. Seedlings of both local cultivars as well as hybrids are available. Basically coconut cultivars are classified into two groups viz., tall and dwarf. A good quality coconut seedling is presented in Plate 1.

i) Tall cultivars: Tall varieties are the common types that occur through out the World. Promising tall cultivar recommended for Kerala is West Coast Tall (WCT). The other cultivars are Lakshadweep Ordinary (LO/ Chandrakalpa) and Andaman Ordinary (AO).

ii) Dwarf cultivars: Chowghat Orange Dwarf (COD), Chowghat Green Dwarf (CGD), Malayan Yellow Dwarf (MYD) and Ganga Bondam(GB) are the dwarf cultivars suited to Kerala. Dwarf varieties are mostly cultivated for tender nuts, ornamental value and for production of hybrids.

iii) Hybrids: Hybrids are inter-varietal crosses of two morphological forms of coconut. They show earliness in flowering and give increased yield, higher quality and better quality of copra and oil. Both Tall x Dwarf (T x D) and Dwarf x Tall (D x T) hybrids are there. The first coconut hybrid in the World was produced in India during 1930s and so far 11 coconut hybrids have been released for commercial cultivation. The popular hybrids suitable for Kerala are Chandra Sankara (COD x WCT), Kera Sankara (WCT x COD), Chandra Laksha (LO x COD), Laksha Ganga (LO x GB), Ananda Ganga (AO x GB), Kera Ganga (WCT x GB), Kerasree (WCT x MYD) and Kera Sowbhagya (WCT x Strait Settlement Apricot Tall).

Plate 1. Coconut seed nuts and seedling


Plate 2. Coconut nursery

3.8.2 Rubber

Though a plantation crop, rubber is predominantly in the small farm category with the plantations in the size group of less than 5 ha accounting for 85 per cent of the total number of holdings.

a) Planting materials

Seedling stumps, budded stumps and polybag plants are the approved planting materials of rubber (Plate 3 and 4). The Rubber Board releases the list of approved planting materials for rubber, every year where the planting materials are classified as categories I, II (a and b), III (a) and III (b).

Category I comprised of clones of RRII 105, RRIM 600 and GT-1, which were recommended for large scale planting as well as for smallholding.

Category II (a and b) comprised of older cultivars, with continued acceptance in certain localities.

Category III (a) and (b) comprised of cultivars with promising performance while still under experimental stage in the country.

Category I is the classification where common and popular clones fall. The cultivars under Category I are budding of clone RRII-105 (Also RRIM 600 and GT-1 in non-traditional areas). Although RRII-105 was the approved clone for Kerala for the year 1996, over the last years, cultivars like RRIM 600, GT-1, PB 28/59, PB 217 and Tjir had been popularized among growers (Source: Rubber Board, 1997).

3.8.3 Cashew

Successful cashew cultivation depends on the selection of best varieties suited for the specific region. All the eight high yielding varieties released by the Kerala Agricultural University are suitable for cultivation in the northern zone (Kasargod,

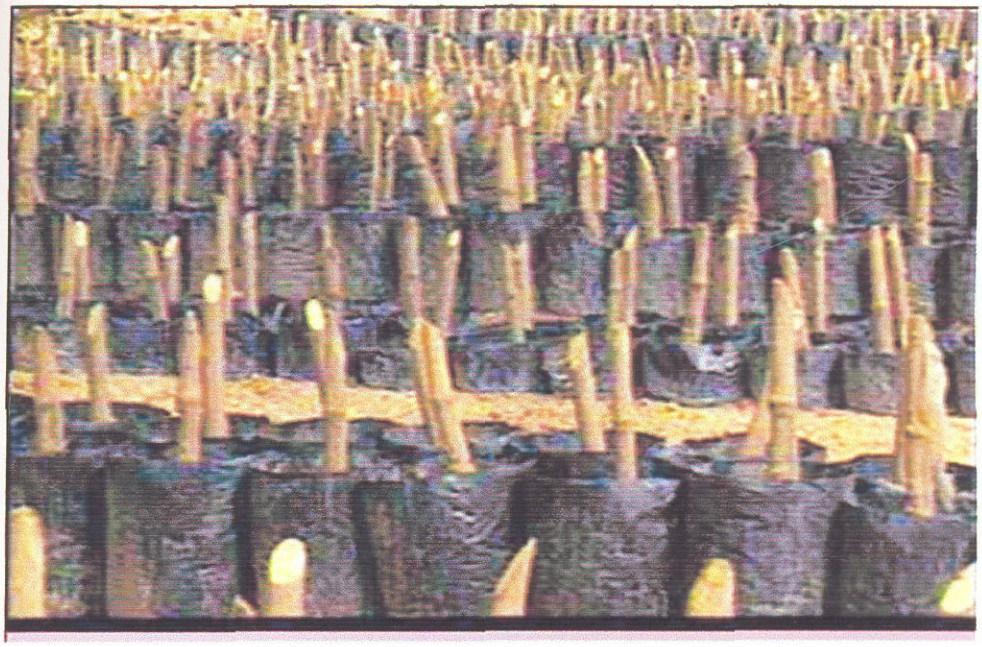


Plate 3. Budded stumps of rubber

Plate 4. Polybag plants of rubber

Kannur, Kozhikode and Malappuram) of Kerala. The high yielding varieties included both selections as well as hybrids.

Selections

| | |
|---|---|
| Anakkayam – 1 | (1982) |
| Madakkathra – 1 & 2 | (1990) |
| Sulabha | (1996) |

| Hybrids | | Parentage |
|---|---|---|
| Kanaka | (1993) | BLA-139-1 x H-3-13 |
| Dhana | (1993) | ALGD-1 x K-30-1 |
| Priyanka | (1995) | BLA-139-1 x K-30-1 |
| Dharasree | (1996) | T30 x Brazil-18 |
| Anagha | (1998) | T20 x K-30-1 |
| Amrutha | (1998) | BLA-139-1 x H-3-13 |
| Akshaya | (1998) | H-4-7 x K-30-1 |

(Source : Salam and Rao, 2001)

a) Planting material

Soft wood grafts are the recommended planting material for cashew. (Plate 5). Owing to the low performance of trees raised from seedlings, the Government of India has banned use of seedlings as planting materials. Grafts are the only approved commercial propagation material for cashew.

3.8.4 Pepper

The productivity of pepper in the country is very low, the main reason for low productivity being the presence of large number of senile unproductive vines. There is need for scaling up the production of quality planting materials in pepper for which a sound production technology is of great relevance (Nybe *et al.*, 1997)

Plate 5. A cashew graft

Plate 6. A cashew nursery

a) Varieties

KAU released varieties like Panniyur-1, Panniyur-2, Panniyur-3, Panniyur-4, Panniyur-5 and IISR released varieties such as Sreekara, Shubhakara, Panchami, Pournami and local varieties like Karimunda, Kuthiravali, Kottanadan, Arakulam Munda, Balankotta, Kalluvally, etc., are important cultivars/varieties suited for the varying agro-climatic conditions of the state.

Pepper is propagated vegetatively through stem cuttings. Runner shoots arising from the base of the plants are the most suitable and widely accepted planting material (Plate 7). 3-5 cuttings planted in a poly bag filled with potting mixture is the material ready for sales. Rapid multiplication technique is used for producing large number of rooted cuttings of improved varieties to be used as planting material.

b) Bush pepper

By planting lateral branches (fruiting branches), pepper could be grown as a bush. This growth pattern suits cultivation in pots. One-year-old branches with 3-5 nodes are selected for planting during March- April. Before planting, the cut ends are treated with 1000 ppm IBA solution for 45 seconds to facilitate rooting. The rooted lateral branch cutting in pots or polythene covers is the planting material of bush pepper (Plate 8).

Plate 7. Pepper cuttings

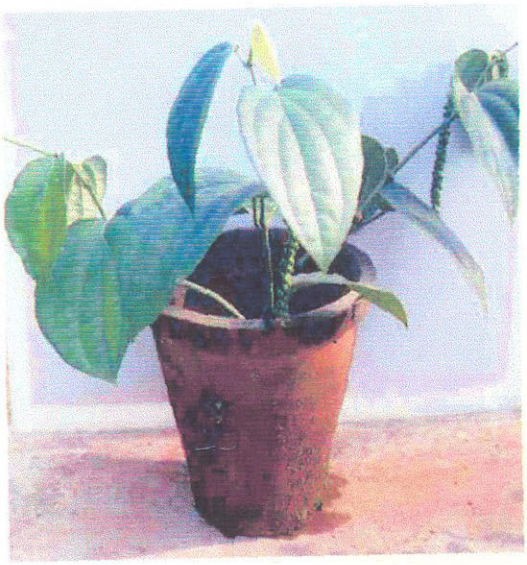


Plate 8. Bush pepper

# Results

# 4. RESULTS

The data collected through the survey were subjected to statistical analysis and the results are presented in four sections. The first section deals with the marketing practices of the organizations like Kerala Agricultural University, Department of Agriculture, Commodity Boards and Private nurseries. The preference of farmers for source and planting materials and the factors influencing such preferences are presented in the second section. The problems and constraints confronted in the marketing and availability of quality planting material are presented in the third section. The suggestions to improve the efficiency of the marketing of planting materials are presented in the last section.

## 4.1 Marketing practices of organizations

The existing marketing practices of the various organizations like Kerala Agricultural University (KAU), Agriculture Department Farms (ADF), Commodity Boards (CB) and Private Nurseries (PN) dealing with planting materials of coconut, rubber, cashew and pepper in respect of product, pricing, placing and promotion factors are discussed here. In the study area, there were 13 farms owned by the Department of Agriculture, two research stations belonging to the Kerala Agricultural University, Central Nursery under the Rubber Board (RB) and 30 private nurseries. Although the Coconut Development Board (CDB) and the Spices Board (SB) had farms and nurseries in the state, none of them were situated in the study area i.e., the districts of Kozhikode, Kannur, Idukki and Kottayam. However, a general write up on the production and marketing practices of planting materials of the crops by the organizations concerned has been included in the discussion part. The list of farms and nurseries in the study area is given in Appendix - III.

### 4.1.1 Product Mix

A product mix is the set of product lines that a particular marketer offers for sale. The different varieties and the various types of planting materials of a crop produced by the agencies can be regarded as product lines in the case of crops. All the agencies produced seeds and planting materials of a variety of crops, but for the nursery

under Rubber Board, which produced planting materials of rubber exclusively. The planting material produced by various agencies is presented in Table 2.

### 4.1.2 Production Policy

Production policy encompasses planning and organizing production, quality monitoring, procurement and storage of seedlings and planting materials by the agencies. The common policies followed for production by the agencies under study included seasonal production and continuous production. The KAU farms in the study area undertook production of planting material one to two months before the onset of the planting season, whereas all the private nurseries followed continuous production. The RBCN at Karikattoor resorted to production of planting materials far in advance of the planting time.

All the Government agencies, the KAU, the ADF and the RB followed centralized production, whereas 13.33 per cent of the private nurseries adopted decentralized production.

An enquiry into the nature of business of agencies revealed that most of the agencies combined both production and distribution of planting materials. Out of the 30 private nurseries studied, 17 (57%) undertook the distribution of whatever material produced exclusively by them and 13 nurseries (43%) outsourced the materials that they were not producing from other private nurseries and distributed to the farmers.

### 4.1.3 Production planning

Capability of the Officer in charge of production is one of the factors that determined the efficiency of an organization. This may be inferred from educational qualifications and experience in the field concerned. The educational qualification of the farm managers of the agencies under consideration is given in Table 3. In the farms

Table 2. Planting materials produced by the agencies

| Sl. No | Agency | Crops |
|---|---|---|
| 1 | KAU | Coconut seedlings, pepper cuttings, cashew grafts, arecanut seedlings, cardamom suckers, fruit plants, vegetable seeds and ornamental plants. |
| 2 | ADF | Coconut seedlings, pepper cuttings, cashew grafts, arecanut seedlings, fruit plants, vegetable seeds and ornamental plants. |
| 3 | RB | Seedling stumps, Budded stumps and poly bag plants of rubber |
| 4 | PN | Coconut seedlings, pepper cuttings, cashew grafts, arecanut seedlings, budded stumps and poly bag plants of rubber, fruit plants, vegetable seeds and ornamental plants. |

Table 3. Educational qualification of farm/ nursery heads

| Sl. No | Agency | MSc.(Ag)/ Ph.D | B.Sc. (Ag.) | M.Sc. (Botany) | VHSC | Non-Professio-nals | Total |
|---|---|---|---|---|---|---|---|
| 1 | KAU | 2* | - | - | - | - | 2 |
| 2 | ADF | 3** | 10 | - | - | - | 13 |
| 3 | RB | - | - | 1 | - | - | 1 |
| 4 | PN | - | 1 | 2 | 2 | 25 | 30 |

* Ph.D. ** M.Sc. (Ag.)

of KAU, Ph.D. holders were in-charge and they were being assisted by Farm Assistants. In three of the farms under Agricultural Department, M.Sc.(Ag.) degree holders were in charge. In the RBCN at Karikkattur, the farm manger was a post-graduate in Botany. However, non-professionals managed most of the private nurseries (83%) and technically qualified persons managed four nurseries. As far as experience was considered the private nursery were having more than ten years of direct experience in undertaking and supervising production whereas the officers in charge of the farms in the public sector usually had less than five years of experience in the field.

### 4.1.4 Factors influencing production decision

In the study, the major factors taken into consideration while deciding on what to produce, how to produce, when to produce and where to produce are arranged in the order of importance as ranked by the agencies are presented in Table 4.

In the case of ADF, the budget provision was the most important factor, which influenced the production decision followed by the requirement for the departmental schemes. The consumer demand was given the least importance by ADF. Aptitude of the farm head and the quality consideration were ranked the first as far as KAU was considered. They were followed by the budget of the institution, availability of parent seed material and demand in the market. The RB considered the demand for a particular clone as the most important factor influencing production decision. The requirement for the departmental scheme, the World Bank assisted Rubber Production and Development Scheme, was the second important factor followed by quality of the material. In the case of private nurseries, demand for the crop was the most important factor influencing production decision. Interest and aptitude of the nursery owner, availability of seed material and finance available were the other factors, which influenced the production decision of private nurseries.

Table 4. Factors influencing production decision

| Sl. No. | Agency / Factors | Rank | | | |
|---|---|---|---|---|---|
| | | ADF | KAU | RB | PN |
| 1 | Demand in the market | VI | IV | I | I |
| 2 | Availability of seed material | IV | III | V | III |
| 3 | Quality | V | I | III | V |
| 4 | Budget / Finance available | I | II | IV | IV |
| 5 | Department schemes | II | VI | II | VI |
| 6 | Aptitude of farm manager | III | I | VI | II |

Table 5. Selling price of planting materials during 1999-2000

(Rs. per seedling/graft)

| Sl. No. | Planting mateiral | Agency | | | |
|---|---|---|---|---|---|
| | | KAU | ADF | RB | PN |
| 1 | Coconut WCT seedling | 20 | 18 | - | 18 |
| 2 | Coconut hybrid | 45 | 20 | - | - |
| 3 | Cashew grafts | 20 | 20 | - | - |
| 4 | Pepper cuttings | 2 | 1.50 | - | 1.50 |
| 5 | Bush pepper (potted) | 20 | 20 | - | 22 |
| 6 | Rubber Poly bag plants | - | - | - | 18 |
| 7 | Rubber Green budded stumps | - | - | 4.0* | 5 |
| 8 | Rubber Brown budded stumps | - | - | 6.0* | 7 |

*Subsidised price

### 4.1.5 Price Analysis

Selling price of planting materials produced by the various agencies in the case of the crops under study is presented in Table 5.

The selling price of coconut seedlings and pepper charged by the KAU was higher when compared to ADF and PN. A perusal of the table indicated that the price charged by PN was the lowest. In the case of coconut hybrids, the KAU rate was very high (Rs.45) compared to ADF. PN were not producing coconut hybrids. Green Budded Stump (GBS) and Brown Budded Stump (BBS) had been charged Rs. 4 and Rs. 6 respectively by the RBCN. They charged Rs.18 for the poly-bagged plants, Rs. 5 for GBS and Rs.7 for BBS. The sale price of pepper cuttings was Rs. 2 in KAU and Rs. 1.50 per cutting in ADF and PN. Potted Bush Pepper was priced Rs.20 by the KAU as well as the ADF and Rs.18-20 by the PN.

Price Determination

Different approaches for fixing up the selling price were followed by the various agencies. The Government agencies, the KAU, the ADF and the RB nursery in general followed the 'Breakeven pricing' whereas; most of the private nurseries followed the 'Cost- plus concept'. The procedure adopted for arriving at the selling price also varied among the agencies and crops, which is explained along with discussion.

### 4.1.6 Channels of distribution

The common channels through which planting materials produced by the various agencies reached the farmers are depicted in the Fig. 6 to 9 given in the following pages.

The sales counter attached to the KAU Research Stations was the main outlet for distribution of seedlings and planting materials. Fairs and exhibitions was another important channel for KAU (Fig. 6.). The ADF undertook production of seeds and planting materials to meet the requirement of the departmental schemes and hence their

Fig. 6. Channels of distribution – Kerala Agricultural University

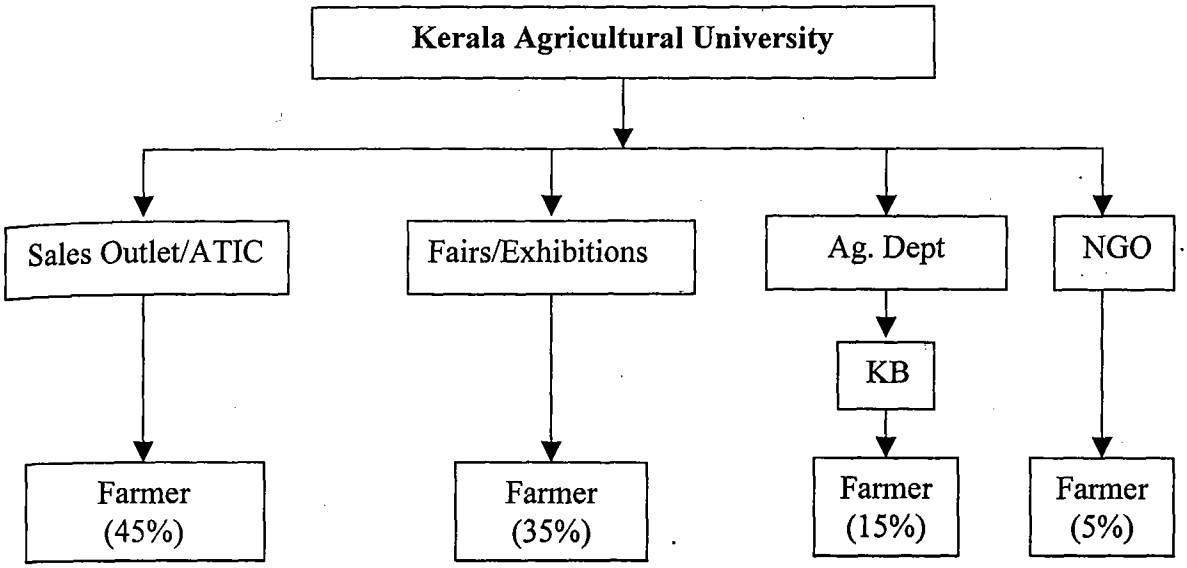



Fig. 7. Channels of distribution –Agriculture Department Farm

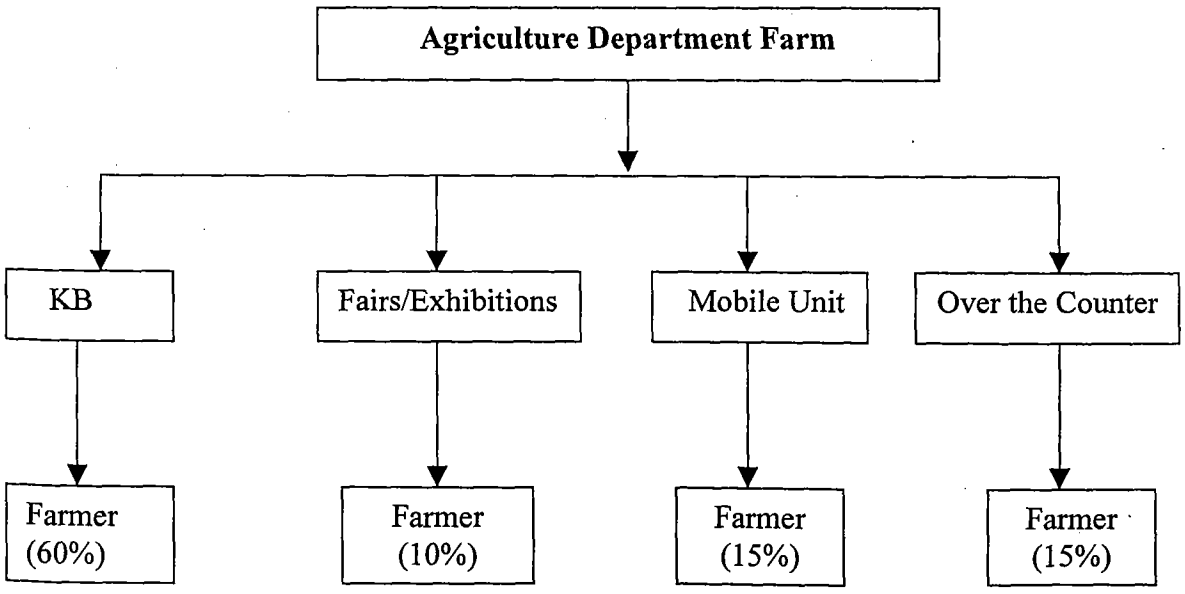


Fig. 8. Channels of distribution - Rubber Board

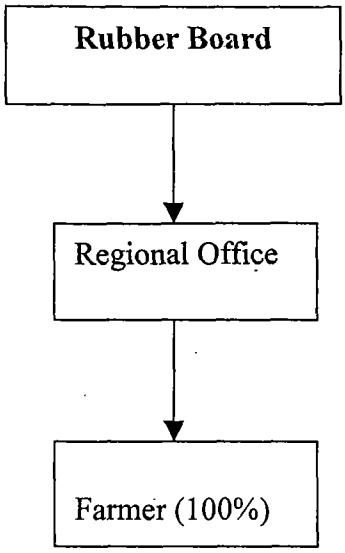
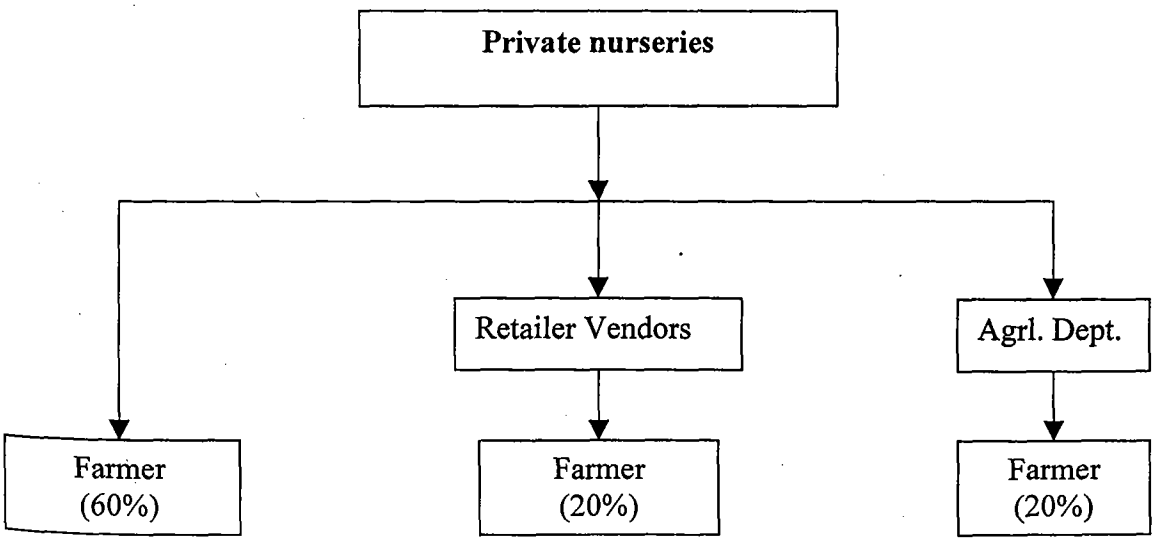



Fig. 9. Channels of distribution - Private nurseries



major channel of distribution was the Krishi Bhavans (Fig. 7). The Rubber Board distributed planting materials to the farmers after prior registration at its Regional Offices (Fig. 8). The farmers who had registered their names at the Regional Offices had to collect the grafts from the RB nursery on intimation from the Board. Private nurseries mainly undertook distribution and sales through their sales outlet attached to the nursery as well as through retailers/cycle vendors (Fig. 9). At times, the Agriculture Department used to procure planting materials from approved PN to meet the requirement for specific schemes. The approximate per centage share of the various channels in the total volume of sales of the agencies as reported by the farm managers concerned were also given in the figures.

4.1.7 Promotional methods

The various methods employed by the agencies for informing the farmer - customer about the availability of quality planting materials is presented in Table 6. Government Agencies resorted to publicity rather than promotional methods. The KAU disseminated information about the availability of planting materials and seeds through All India Radio (AIR). The *'Vayalum Veedum'* programme and the *'Karshika Sarvakalasala Varthaka*l' are the AIR programmes which deal with agricultural subjects. The Farm Day Celebrations organized at the Research Stations of KAU and the exhibitions and local melas also gave publicity about the availability of planting materials and seeds. The KAU also gave advertisement in the University publication, 'Kalpadhenu' during planting seasons.

In the case of ADF, radio was the main source giving information about the availability of planting materials, followed by field officers in the department and the print media. The Rubber Board made use of its field staff to inform the farmers about the availability of planting materials. They also used print media like newspapers apart from the Rubber magazine to inform the farmers about the availability of planting materials. On the other hand banners and posters were the main promotional methods used by private nurseries, followed by slide shows in the local theatres and advertisement in newspapers.

### 4.1.8 Customer profile

The proportionate distribution of the regular customers of the various agencies is given in Table 7.

Small farmers constituted more than 50 per cent of the regular customers of KAU and private nurseries. But for ADF, the Department of Agriculture was the major customer (54%), followed by large farmers (21%). In the case of RB nursery majority of the regular customers were large farmers (36%) followed by marginal farmers (28%).

### 4.1.9 Support services provided to farmers

The support services provided was mostly of the nature of giving technical advice and the pattern of the support services given to the farmer-customers by the agencies are given in Table 8.

The sales support services provided by the all agencies was of the nature of providing technical advice alone except in the case of Rubber Board. The Rubber Board provided a package of incentives to the rubber growers, which included both technical advice and financial assistance.

KAU and ADF provided technical advice on cultivation aspects of crops. Private nurseries, generally would not give any advice on cultivation aspects and 33 per cent of them gave technical advice on request and about 13 per cent gave advice to the farmer- customer voluntarily.

In order to assess the performance of the seedlings and grafts supplied, it is necessary to collect the feedback from the farmers. The per centage contribution of various formal and informal methods employed to collect feedback by the agencies is presented in Table 9. The KAU obtained feedback directly from (33%) and through telephone calls (28%). In the case of ADF, 69 per cent of the feedback was obtained through the intermediaries like field staff and 28 per cent through letters.

Table 6. Promotional methods adopted by agencies

| Method / Agency | Rank | | | |
|---|---|---|---|---|
| | Radio | Print media | Field Officers | Others |
| KAU | I | II | - | Exhibitions/ Farm Day |
| ADF | I | III | II | - |
| RB | - | II | I | - |
| PN | - | III | - | Banners- I<br>Cinema Theatre Slide Shows – II |

Table 7. Regular customers of the agencies

| Agency | Category of customers (%) | | | | |
|---|---|---|---|---|---|
| | SF | MF | LF | VO | GA |
| KAU | 52.7 | 26.9 | 12.1 | 4.4 | 4.0 |
| ADF | 12.5 | 12.5 | 21.4 | - | 53.6 |
| RB | 18.2 | 27.8 | 35.5 | 9.5 | - |
| PN | 61.8 | 30.0 | 5.9 | - | 2.3 |

SF- Small farmer MF- Marginal farmer LF-Large farmer
VO- Voluntary organisation GA- Government agency

Table 8. Support services provided to farmer-customer

(Percentage)

| Agency | Technical advice on request | Technical advice given voluntarily | No technical advice | Total |
|---|---|---|---|---|
| KAU | 50 | 50 | - | 100 |
| ADF | 46.2 | 53.8 | - | 100 |
| RB | - | 100 | - | 100 |
| PN | 33.4 | 13.3 | 33.3 | 100 |

In the case of Rubber Board about 60 per cent of the feed back was collected through field staff and 20 per cent was directly obtained from the farmers. Private nurseries usually did not bother to collect feedback and 30 per cent of the feedback was obtained directly from the farmers.

## 4.2 Farmers' preference to source and planting material.

In this part, results of the analysis of the preference of farmers to various sources and type of planting materials and the factors influencing such preferences are outlined.

### 4.2.1 Preference of farmers to sources.

A crop-wise analysis of the preference of farmers to particular source is attempted in the following paragraphs. From the farmers' point of view Krishi Bhavans, Agricultural Department Farms (ADF), Kerala Agricultural University (KAU), private nurseries and fellow farmers (FF) were regarded as reliable sources for getting planting materials. The frequency of farmers' preference to sources in the case of coconut is given in Table 10.

A perusal of the table showed that about 95 per cent of the respondent farmers had chosen FF as the preferred source for coconut seedlings. The KAU and ADF had been given second and third position by 48 per cent and 36 per cent of the respondents respectively. None of the coconut farmers had chosen either Krishi Bhavan or private nursery as the first preferred source.

Detailed analysis of the source preference by coconut farmers in terms of some criteria like credibility of the source, quality of the seedlings supplied, variety, price and availability is presented in Table 11.The results showed that with respect to the quality of seedlings, credibility of the source and for local availability, the FF were reckoned as the first preferred source. For the preferred variety/cultivars and price, the farmers preferred KAU and KB respectively.

Table 9. Methods used by agencies to get feed back

(Percentage)

| Sl. No | Agency | Methods | | | | | |
|---|---|---|---|---|---|---|---|
| | | Letters | Telephone | Intermedi-aries | Farmers | No feedback | Total |
| 1 | KAU | 14 | 27.5 | - | 32.5 | 26 | 100 |
| 2 | ADF | 19.5 | 8.5 | 30 | 12.4 | 29.6 | 100 |
| 3 | RB | 10 | 10 | 60 | 20 | - | 100 |
| 4 | PN | 10 | 10 | - | 30 | 50 | 100 |

Table 10. Coconut farmers' preference to sources of planting materials

| Sl. No. | Preferential ranks / Source | I | | II | | III | | IV | | V | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | F | % | F | % |
| 1 | KB | 0 | 0 | 10 | 13.3 | 11 | 14.7 | 39 | 52.0 | 15 | 18.9 |
| 2 | PN | 0 | 0 | 2 | 2.7 | 1 | 1.3 | 16 | 21.3 | 56 | 47.7 |
| 3 | KAU | 3 | 4 | 35 | 48.0 | 28 | 37.3 | 6 | 8.0 | 2 | 2.7 |
| 4 | ADF | 1 | 1.3 | 27 | 36.0 | 33 | 44.0 | 12 | 16.0 | 2 | 2.7 |
| 5 | FF | 71 | 94.7 | 1 | 1.3 | 2 | 2.7 | 2 | 2.7 | 0 | 0 |
| | Total | 75 | 100 | 75 | 100 | 75 | 100 | 75 | 100 | 75 | 100 |

F - Frequency

Table 11. Factors influencing farmers' preference to source -Coconut.

| Preference / Criteria | I | II | III | IV | V |
|---|---|---|---|---|---|
| Quality | FF (88.3) | KAU(75.3) | ADF (71.6) | PN (53.5) | KB (52.5) |
| Credibility | FF (94.3) | KAU(76.8) | ADF(71.5) | KB (52) | PN (50) |
| Variety | KAU(78.5) | ADF(72.5) | PN (69.9) | F (66.1) | KB (32.4) |
| Local availability | FF (94.8) | KB (78.9) | PN (70) | ADF(60.7) | KAU(19.8) |
| Price | KB (67.3) | FF (63.2) | ADF(50.4) | KAU(50.1) | PN (46.5) |
| Confirmed availability | ADF(98.9) | FF (92) | PN (73.7) | KAU(72.8) | KB (18) |

(Figures in brackets represent criterion indices)

The frequency of farmers' preference to sources in the case of rubber is given in Table 12. About 57 per cent of the farmers gave first preference and about 41 per cent had given the second preference to RB as the preferred source of planting material. PN were given first preference by 29 per cent of the farmers. About 12 per cent of the farmers had given first preference and 25 per cent had given second preference to FF as their preferred source.

A detailed analysis of the source preference by the rubber farmers in terms of quality, goodwill, preferred variety, availability and price is presented in Table 13.

Out of the six criteria listed, the RB got maximum index for quality (71.7), preferred variety (66.3)and price (48.1) and second preference with respect to credibility (72.5) and confirmed availability (74.0). As far as timely and confirmed availability of planting material was considered, the RB nursery although ranked second, (74.0) was comparable with fellow farmers who got an index of 78.2. With respect to local availability, FF was preferred most, followed by private nurseries and RB nursery. As far as the criterion price was considered, RB nursery was the first preference, followed by FF and PN.

Cashew was a neglected crop, a few years back, which has gained the status of a 'cultivated crop' recently. The cashew farmers' preference to various sources, which produce and/or distribute quality grafts and seedlings is presented in Table14. FF were preferred most as the source of quality planting material by nearly 55 per cent of the farmers, followed by ADF. KAU was preferred by only 16 per cent as the first choice.

A perusal of Table 15 on source preference of cashew farmers based on certain criteria indicated that excepting the availability of preferred variety and credibility, for all other criteria, i.e. quality, local availability, price and confirmed availability, the farmers of Kannur district preferred FF. Only for getting the variety of their choice, farmers considered KAU as a better choice (criterion index 75.5). KB and PN were the least preferred sources with respect to quality, credibility, preferred variety and confirmed availability with regard to cashew.

Table 12. Rubber farmers' preference to sources of planting material

| Sl. No. | Preferential ranks / Source | I | | II | | III | |
|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % |
| 1 | RB | 43 | 57.3 | 31 | 41.3 | 1 | 1.3 |
| 2 | PN | 22 | 29.4 | 28 | 37.3 | 25 | 33.3 |
| 3 | FF | 10 | 12.3 | 19 | 25.3 | 46 | 61.3 |
| | Total | 75 | 100 | 75 | 100 | 75 | 100 |

F - Frequency

Table 13. Factors influencing farmers' preference to source – Rubber.

| Sl. No. | Preference / Criterion | I | II | III |
|---|---|---|---|---|
| 1 | Quality | RB (71.7) | PN (57.3) | FF (69.1) |
| 2 | Credibility | FF (80.5) | RB (72.5) | PN (56.8) |
| 3 | Variety | RB (66.3) | PN (62.7) | FF (60.3) |
| 4 | Local availability | FF (75.1) | PN (64.3) | RB (41.1) |
| 5 | Price | RB (48.1) | FF (44.3) | PN (42.1) |
| 6 | Confirmed availability | FF (78.2) | RB (74.0) | PN (68.3) |

(Figures in parentheses show criterion index)

The preference of the farmers in Idukki district for the sources supplying planting materials of pepper is presented in Table 16.

Majority of the pepper farmers (88%) in the sample area preferred fellow farmer as the best source for getting quality vine cuttings. None of the farmers had given the first preference to private nursery. The KAU and ADF were given first preference by just five per cent of the farmers. All other agencies had been ranked much low.

Detailed analysis of the source preference based on quality of the material produced, credibility of the source, price and availability are presented in Table 17.

For all the criteria, from quality to confirmed and timely availability, fellow farmers surpassed the other agencies. For all the six criteria, FF got criterion indices above 80. Even for the variety of farmers' choice, KAU could get a criterion index 67. Among other sources, KAU held a comfortable position with criterion indices around 70 with respect to quality, credibility and availability of preferred variety. With regard to price, KB got the second place and for local and confirmed availability, PN got the second preference.

The Path Coefficient analysis was carried out by taking source as dependent variable and criterion as explanatory variable for the selected crops. The factors that were found to influence the source preference of farmers' were quality, credibility, preferred variety, local availability, price and confirmed availability. Separate paths were developed for the selected crops with regard to the available sources. The path having the lowest Residual value (R) in the case of each crop was selected for illustration in a diagrammatic manner. The R values of the path with respect to FF were found to be the lowest for all the four selected crops. The correlation matrices of the preference criteria of coconut, rubber, cashew and pepper farmers to the source, FF were given in the Tables 18, 19, 20 & 21 respectively. The corresponding path diagrams were given in Fig. 10,11,12 and 13.The matrixes of direct and indirect effects of the explanatory variables are given in Appendix V.

Table 14. Cashew farmers' preference to sources of planting material.

| Sl. No. | Preferenitial ranks / Source | I | | II | | III | | IV | | V | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | F | % | F | % |
| 1 | KB | 5 | 6.7 | 7 | 9.3 | 13 | 17.3 | 34 | 45.3 | 16 | 21.3 |
| 2 | PN | 2 | 2.7 | 0 | 0 | 8 | 10.7 | 16 | 21.3 | 49 | 65.3 |
| 3 | KAU | 12 | 16.0 | 29 | 38.7 | 26 | 34.7 | 8 | 10.7 | 0 | 0 |
| 4 | ADF | 16 | 21.3 | 29 | 38.7 | 20 | 26.7 | 5 | 6.7 | 5 | 6.7 |
| 5 | FF | 40 | 54.7 | 10 | 13.3 | 8 | 10.7 | 12 | 16.0 | 5 | 6.7 |
| | Total | 75 | 100 | 75 | 100 | 75 | 100 | 75 | 100 | 75 | 100 |

F - Frequency

Table 15. Factors influencing farmers' preference to source - Cashew

| Sl. No. | Preference / Criterion | I | II | III | IV | V |
|---|---|---|---|---|---|---|
| 1 | Quality | FF (83.7) | KAU (78.5) | ADF (78.1) | KB (64.7) | PN (56.3) |
| 2 | Credibility | KAU(89.6) | FF (79.5) | ADF (77.5) | KB (57.8) | PN (46.4) |
| 3 | Variety | KAU(75.5) | ADF (71.3) | FF (70.7) | PN (60.3) | KB (33.2) |
| 4 | Local availability | FF (88.5) | KB (73.5) | PN (71.1) | ADF (51.6) | KAU(27.9) |
| 5 | Price | FF (72.1) | KB (64.9) | ADF (51.9) | KAU(50.8) | PN (48.3) |
| 6 | Confirmed availability | FF (92.4) | PN (75.7) | KAU(67.1) | ADF (66.9) | KB (26.8) |

(Figures in parentheses show criterion index)

Table 16. Pepper farmers' preference to sources of planting material

| Sl. No. | Preferential ranks / Source | I | | II | | III | | IV | | V | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | F | % | F | % |
| 1 | KB | 1 | 1.3 | 16 | 21.3 | 19 | 25.3 | 18 | 24.0 | 21 | 28.0 |
| 2 | PN | 0 | 0 | 15 | 20.0 | 12 | 16.0 | 13 | 17.3 | 35 | 46.7 |
| 3 | KAU | 4 | 5.3 | 20 | 26.7 | 24 | 32.0 | 20 | 26.7 | 7 | 9.3 |
| 4 | ADF | 4 | 5.3 | 19 | 25.3 | 20 | 26.7 | 20 | 26.7 | 12 | 16.0 |
| 5 | FF | 66 | 88.0 | 5 | 6.7 | 0 | 0 | 4 | 5.3 | 0 | 0 |
| | Total | 75 | 100 | 75 | 100 | 75 | 100 | 75 | 100 | 75 | 100 |

F - Frequency

Table 17. Factors influencing farmers' preference to source– Pepper

| Sl. No. | Preference / Criterion | I | II | III | IV | V |
|---|---|---|---|---|---|---|
| 1 | Quality | FF(85.3) | KAU (64.8) | ADF(63.8) | KB (50.9) | PN (44.9) |
| 2 | Credibility | FF (88.4) | KAU(65.1) | ADF(62.7) | KB (54) | PN (38.5) |
| 3 | Variety | FF(70.9) | KAU(67.1) | ADF(63.7) | PN (52.0) | KB (32.1) |
| 4 | Local availability | FF(86.5) | PN(71.6) | KB (68.8) | ADF(53.1) | KAU (42.0) |
| 5 | Price | FF(67.3) | KB (61.7) | ADF(45.9) | KAU(45.2) | PN (44.4) |
| 6 | Confirmed availability | FF(84.5) | PN (64.1) | ADF(61.3) | ADF (60.9) | KB (26.5) |

(Figures in parentheses are criterion indices)

The crop and source wise analysis of the path coefficients indicated that quality had a direct effect of 0.3717 and its substantial indirect effects were -0.2886 through credibility of source, -0.0935 through availability of preferred variety, -0.1347 through local availability, 0.0259 through price of coconut seedling and -0.1630 through confirmed availability.

Credibility of the source had a direct effect of 0.1140 on preference for KB as perceived by coconut farmers and its indirect effects were 0.885 through quality, 0.0283 through preferred variety, 0.0520 through local availability, -0.0112 through price and 0.0336 through confirmed availability.

Availability of preferred variety/ cultivar of coconut had a direct effect of 0.1257 on farmers' preference for KB and its indirect effects were 0.0316 through quality, 0.0312 through credibility, -0.0214 through local availability and 0.0426 through price.

The direct effect of local availability was 0.1965 on preference for KB as perceived by coconut farmers and its indirect effects were 0.0709 through quality, 0.0893 through credibility, -0.033 through preferred variety and -0.0625 through price.

The price of coconut seedlings had a direct effect of 0.1140 on preference and its substantial indirect effects were -0.0078 through quality, -0.011 through credibility, 0.0378 through preferred variety and 0.0152 through confirmed availability.

The direct effect of confirmed availability of planting materials was 0.0978 on farmers' preference to source and its substantial indirect effects were 0.0429 through quality, 0.0314 through credibility, 0.0474 through preferred variety and 0.0133 through price.

The direct and indirect effects of the explanatory variables on other sources like KAU, PN, ADF and FF for coconut as well as for rubber, cashew and pepper could also be explained in a similar way.

Table 18. Correlation matrix of preference criteria of coconut farmers to source - Fellow Farmer

| Criteria | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ |
|---|---|---|---|---|---|---|
| $X_1$ | 1 | | | | | |
| $X_2$ | 0.7764** | 1 | | | | |
| $X_3$ | 0.2514** | 0.3201** | 1 | | | |
| $X_4$ | 0.3624** | 0.5878** | -0.17 | 1 | | |
| $X_5$ | -0.0694 | -0.0981 | 0.3394** | -0.3188** | 1 | |
| $X_6$ | 0.4387** | 0.3208** | 0.4851** | -0.2663** | 0.1361 | 1 |

Residual R = 0.78371
** Significant at 5% level
$X_1$ - Quality; $X_2$ - Credibility; $X_3$ - Variety; $X_4$ - Local availability
$X_5$ - Price; $X_6$ - Confirmed availability

Table 19. Correlation matrix of preference criteria of rubber farmers to source - Fellow Farmer

| Criteria | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ |
|---|---|---|---|---|---|---|
| $X_1$ | 1 | | | | | |
| $X_2$ | 0.6678** | 1 | | | | |
| $X_3$ | 0.3608** | 0.6464** | 1 | | | |
| $X_4$ | 0.1395 | 0.3144** | 0.5612** | 1 | | |
| $X_5$ | 0.5428** | 0.4695** | 0.1994 | -0.091 | 1 | |
| $X_6$ | 0.4380** | 0.6153** | 0.6228** | 0.2364** | 0.4** | 1 |

Residual R = 0.5474
** Significant at 5% level
$X_1$ - Quality; $X_2$ - Credibility; $X_3$ - Variety; $X_4$ - Local availability
$X_5$ - Price; $X_6$ - Confirmed availability

Table 20. Correlation matrix of preference criteria of pepper farmers to source - Fellow Farmer

| Criteria | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ |
|---|---|---|---|---|---|---|
| $X_1$ | 1 | | | | | |
| $X_2$ | 0.7292** | 1 | | | | |
| $X_3$ | 0.4499** | 0.6421** | 1 | | | |
| $X_4$ | 0.5619** | 0.6913** | 0.5650** | 1 | | |
| $X_5$ | 0.0853 | 0.2593** | 0.2988** | 0.1861 | 1 | |
| $X_6$ | 0.2547** | 0.4442** | 0.4025** | 0.4873** | 0.0842 | 1 |

Residual R = 0.5610
** Significant at 5% level
$X_1$ - Quality; $X_2$ - Credibility; $X_3$ - Variety; $X_4$ - Local availability
$X_5$ - Price; $X_6$ - Confirmed availability

Table 21. Correlation matrix of preference criteria of cashew farmers to source - Fellow Farmer

| Criteria | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ |
|---|---|---|---|---|---|---|
| $X_1$ | 1 | | | | | |
| $X_2$ | 0.5007** | 1 | | | | |
| $X_3$ | 0.3403** | 0.5596** | 1 | | | |
| $X_4$ | 0.0985 | 0.1948 | 0.3933** | 1 | | |
| $X_5$ | 0.3430** | 0.2735** | 0.2189 | 0.1666 | 1 | |
| $X_6$ | 0.1683 | 0.4229** | 0.5039** | 0.50** | 0.0409 | 1 |

Residual R = 0.7259
** Significant at 5% level
$X_1$ - Quality; $X_2$ - Credibility; $X_3$ - Variety; $X_4$ - Local availability
$X_5$ - Price; $X_6$ - Confirmed availability

In general, it was found that in almost all the cases the path analysis was not effective as the residuals were very high except in the case of rubber where the path coefficient analysis of FF was found to be somewhat effective with a residual of 0.54.

The farmers' preference to source is analyzed using Rank Based Quotient and is presented in Table 22.

Coconut and pepper farmers mostly preferred FF for getting quality planting material with RBQs 85.07 and 87.5 respectively. In the case of cashew, KAU was the preferred source with RBQ 66.2, followed by FF (RBQ-60.2). For rubber, the RB was the most preferred source followed by PN with RBQs 72 and 65.3 respectively.

4.2.2 Sources of information about planting materials

Farmers generally got information about the availability of planting material from a source through various media like, print, TV, Radio, field level extension officers, friends and relatives, exhibitions, seminars and melas. In this part, the various sources giving information about planting materials of the crops selected for the study are given first, followed by the adequacy and timeliness of information obtained.

The source through which farmers got information about planting materials of coconut are given in Table 23.

The main source of information on availability of seedlings from KB was the extension officers (52%) followed by friends and relatives (47%). From the PN the information was mainly obtained through friends and relatives (59%) followed by print (52%). As far as KAU was considered, 60 out of the 75 respondent farmers had opined that the main source disseminating the information was radio followed by print (39%). According to coconut farmers the information from ADF was obtained through extension officers (40%) followed by print whereas the friends and relatives disseminated the information through word of mouth.

Table 22. Farmers' preference to source of planting material – All crops

| Sl. No | Preferential ranks / Crop | I | II | III | IV | V |
|---|---|---|---|---|---|---|
| 1 | Coconut | FF (85.07) | KAU(60.8) | ADF(57.47) | KB(44.3). | PN(40.1) |
| 2 | Rubber | RB (72.0) | PN (65.3) | FF (50.6) | - | - |
| 3 | Cashew | KAU(66.2) | FF (60.2) | ADF (60) | KB (39.1) | PN(25.6) |
| 4 | Pepper | FF (87.5) | ADF(58.4) | KAU(54.3) | KB (48.8) | PN(42.9) |

(Corresponding RBQs are given in parentheses).

Table 23. Source of information on availability of planting materials of coconut

n = 75

| Sl. No. | Agency / Source | KB | PN | KAU | ADF | FF |
|---|---|---|---|---|---|---|
| 1 | Print | 17 (22.7) | 39 (52) | 29 (38.7) | 27 (36) | 12 (16) |
| 2 | Electronic media | 5 (6.7) | 1 (1.3) | 60 (80) | 9 (12) | 2 (2.7) |
| 3 | Friends& relatives | 35 (46.7) | 44 (58.7) | 5 (6.7) | 17 (22.7) | 25 (33.3) |
| 4 | Extension officers | 39 (52) | 0 (0) | 9 (12) | 30 (40) | 0 (0) |
| 5 | Seminar/Exhibitions | 17 (22.7) | 17 (22.7) | 27 (36) | 14 (18.7) | 1 (1.3) |

(Figures in parentheses show percentage to total respondents)

The various sources through which farmers got information about planting materials of rubber given in Table 24 showed that 88 per cent of the farmers got information through the Extension officers followed by seminars and exhibitions (77%). About 56 per cent of the respondents reported that they got the information through radio. With regard to PN, 33 per cent of the farmers received the information through the print and 32 per cent got the information through friends and relatives.

A perusal of Table 25 indicated that around 81 per cent of the farmers got the information on availability of planting materials of cashew from the KB through radio and 76 per cent said that they got the information through word- of- mouth. Around 30 per cent of the farmers received the information through the print and 43 per cent got the information through the seminars and exhibitions conducted by the KB. In the opinion of 88 per cent of the farmers, radio was the main source that gave information about availability of planting materials at KAU. 37 per cent of the farmers reported that they got information on planting materials of cashew from ADF through friends and relatives. Nearly 41 per cent of cashew farmers told that that they received the information from friends and relatives.

The distribution of source through which farmers got information about planting materials of pepper from the various agencies is given in Table 26. Nearly 75 per cent of the farmers reported that they got the information from the KB through extension officers and 60 per cent got the information through radio. In the case of PN, 64 per cent of the farmers opined that they received the information through the print and about 52 per cent through friends and relatives. About 82 per cent of the farmers reported that they got the information from KAU, through the radio and 56 per cent got the information through print. In the case of ADF, 37 per cent of the farmers opined that they received the information through the extension officers and 32 per cent got the information through the print. In the case of Fellow farmers, 52 per cent of the respondents opined that they got the information about availability of pepper through word of mouth talks with friends and relatives.

Table 24. Source of information on availability of planting materials of rubber

n= 75

| Sl. No. | Agency / Source | Rubber Board | Private nursery | Fellow Farmer |
|---|---|---|---|---|
| 1 | Print | 40 (53.3) | 25 (33.0) | 8 (10.7) |
| 2 | Electronic media | 42 (56) | 18 (24) | 6 (8) |
| 3 | Friends& relatives | 8 (10.7) | 24 (32.0) | 38 (50.7) |
| 4 | Extension officers | 66 (88) | 20 (26.7) | 3 (40) |
| 5 | Seminar/Exhibition | 78 (77.3) | 1 (1.3) | 1 (1.3) |

(Figures in parentheses show percentage to total respondents)

Table 25. Source of information on availability of planting materials of cashew

n= 75

| Sl. No | Agency / Source | KB | PN | KAU | ADF | FF |
|---|---|---|---|---|---|---|
| 1 | Print | 23 (30.7) | 33 (44) | 31(41.3) | 16 (9.3) | 18 (24) |
| 2 | Electronic media | 61(81.3) | 4 (5.3) | 66 (88) | 18 (24) | 0 (0) |
| 3 | Friends& relatives | 57 (76) | 16 (21.3) | 5 (6.7) | 7 (9.3) | 31(41.3) |
| 4 | Extension officers | 23 (30.7) | 0 (0) | 4 (5.3) | 28(37.3) | 1 (1.3) |
| 5 | Seminar/Exhibition | 32 (42.7) | 8 (10.7) | 16(21.3) | 9 (12) | 6 (8) |

(Figures in parentheses show percentage to total respondents)

Table 26. Source of information on availability of planting materials of pepper

n= 75

| Sl. No. | Agency / Source | KB | PN | KAU | ADF | FF |
|---|---|---|---|---|---|---|
| 1 | Print | 44 (58.7) | 48 (64) | 42 (56) | 24(32) | 24(32) |
| 2 | Electronic media | 45 (60.0) | 3 (4) | 62 (82.7) | 0 | 0 |
| 3 | Friends& relatives | 37 (49.3) | 39 (52) | 3 (4.0) | 5 (6.7) | 40(53.3) |
| 4 | Extension officers | 56 (74.7) | 1 (1.3) | 12 (16) | 28 (37.3) | 2 (2.7) |
| 5 | Seminar/Exhibition | 36 (48) | 27 (36) | 9 (12.0) | 17 (22.7) | 3 (4.0) |

(Figures in parentheses show percentage to total respondents)

A perusal of the four tables gave information about the prominent sources through which different agencies provided information on the availability of quality planting materials of the crops to farmers.

4.2.2 Adequacy and timeliness of information

In the coming paragraphs an attempt was made to assess the adequacy and timeliness of information. The adequacy of information from sources producing planting material is given in Table 27.

The results from the table indicated that in the case of coconut, the information received from all the sources, except fellow farmers were largely inadequate. As far as rubber is considered, 65 out of the 75 respondent farmers opined that the information from the RB was adequate and served the purpose and in the case of private nurseries 56 farmers (74.7%) opined that the information was adequate. According to 37 per cent of the coconut farmers, 25 per cent of the cashew farmers and 58 per cent of the pepper farmers, the information from the KB was adequate. With respect to PN, nearly 37 per cent of the coconut farmers, 75 per cent of the rubber farmers, 47 per cent of the cashew farmers and 33 per cent of the pepper farmers reported that the information from the PN was adequate. As far as KAU is considered, 41 out of the 75 respondent cashew farmers (54.7%), 32 per cent of the coconut farmers and 19 per cent of the pepper farmers opined that the information was adequate. The information on planting materials from ADF, was found to be inadequate with regard to all the selected crops. In the case of FF, 80 per cent of the coconut farmers, 53 per cent of the rubber farmers, 44 per cent of the cashew farmers and 55 per cent of the pepper farmers had reported adequacy of information.

The frequency index of timeliness of information from the sources producing planting materials as responded by the farmers is presented in Table 28.

In the opinion of coconut farmers, the KAU held the first position in giving timely information on availability of planting materials (59) followed by fellow farmers (50) and private nursery (49). In the case of rubber, the Rubber Board ranked first (78) followed by private nursery (68) and fellow farmers (53). As far as cashew was

Table 27. Adequacy of information from sources of planting materials

n = 75

| Sl. No. | Crop / Source | Coconut | | Rubber | | Cashew | | Pepper | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | F | % |
| 1 | KB | 30 | 37.2 | - | | 19 | 25.3 | 44 | 58.7 |
| 2 | PN | 28 | 36.7 | 56 | 74.7 | 35 | 46.7 | 25 | 33.3 |
| 3 | KAU | 24 | 32.0 | - | | 41 | 54.7 | 14 | 18.7 |
| 4 | ADF | 5 | 6.7 | 65 | 86.7* | 14 | 18.6 | 9 | 12.0 |
| 5 | FF | 60 | 80.0 | 40 | 53.3 | 33 | 44.0 | 41 | 54.7 |

*Rubber Board F - Frequency

Table 28. Frequency index of timely information from sources of planting materials

| Sl. No. | Crop / Source | Coconut | Rubber | Cashew | Pepper |
|---|---|---|---|---|---|
| 1 | KB | 36.0 | - | 39.33 | 49.3 |
| 2 | PN | 48.7 | 68 | 66.0 | 54.0 |
| 3 | KAU | 58.7 | - | 44.6 | 36.2 |
| 4 | ADF | 41.3 | 78* | 30.0 | 26.7 |
| 5 | FF | 50.0 | 52.7 | 52.7 | 56.0 |

* Rubber Board

considered, it was the private nurseries that gave the timely information about planting materials followed by fellow farmers (53). Pepper farmers were of the opinion that they got timely information from fellow farmers (56) followed by private nurseries (54) and KB (49). The frequency indices for KAU with regard to timely information were 59 for coconut, 45 for cashew and 36 for pepper and the corresponding indices for KB were 36, 39 and 49.

### 4.2.4 Farmers' awareness about and preference to varieties of the selected crops

In this section, the awareness of farmers about varieties and cultivars of the selected crops released from research stations/institutions, the preferences of farmers to particular varieties of a crop and the reasons for preferring a particular variety as perceived by the farmers are also discussed.

#### 4.2.4.1 Coconut

The awareness of farmers about the varieties/ cultivars of coconut released by the Central Plantation Crops Research Institute, (CPCRI) Kasargod and KAU suited to Kerala are given in Table 29. Almost all the farmers were fully aware about the local cultivar, West Coast Tall (WCT), the awareness index being 100. Farmers' awareness about T x D hybrid was fairly large, with an index of 73.3 followed by D x T (46.7). The awareness index for almost all the new hybrids were below 25.

#### 4.2.4.2 Rubber

The popular varieties of rubber suited to Kerala conditions are RRII 105, RRIM 600, PB 260 and GT 1. The awareness of farmers about the varieties is given in Table 30.The most suitable variety of rubber under Kerala conditions was RRII 105 registering an awareness index of 96.0 followed by RRIM 600 (92). GT-1 and PB 260 were ranked third and fourth with regard to awareness.

The reasons for farmers' preference to the cultivar, RRII 105 over others was analysed which indicated that with regard to attributes like latex yield, DRC, thickness of regenerated bark, tolerance to abnormal leaf fall and wind damage, RRII 105 had

Table 29. Farmers' awareness about coconut varieties n=75

| Sl No | Variety | Frequency | | | Awareness index | Rank |
|---|---|---|---|---|---|---|
| | | Aware | Some what aware | Not at all aware | | |
| 1 | WCT | 75 | - | - | 100 | I |
| 2 | T x D | 55 | 10 | 10 | 80.0 | II |
| 3 | D x T | 35 | 18 | 22 | 58.7 | III |
| 4 | LDO | 20 | 14 | 41 | 36.0 | IV |
| 5 | CDO | 6 | 22 | 47 | 22.7 | V |
| 6 | Komadan | 4 | 25 | 46 | 22 | VI |
| 7 | Kerasree | 5 | 21 | 49 | 20.7 | VII |
| 8 | Laksha Ganga | 4 | 11 | 60 | 12.7 | VIII |
| 9 | CDG | 5 | 7 | 63 | 11.3 | IX |
| 10 | Kera Ganga | 3 | 6 | 66 | 8.0 | X |
| 11 | Anatha Ganga | 1 | 6 | 68 | 5.3 | XI |

ranked first by the farmers. The farmers opined that in the present situation they were not looking for a substitute for RRII 105.

4.2.4.3 Cashew

Although several high yielding varieties released by KAU were available, those varieties suited to Kannur were selected after discussion with researchers and Agricultural Officers. Awareness of farmers about these varieties is given in Table 31.

All the farmers reported awareness about local varieties but they were not familiar with many of the new varieties. The frequency index of awareness about local non-descript cultivars was 92 where as the indices for new high yielding varieties like Madakkathara, Priyanka, Kanaka, Dhana and Dharasree varied from 17 to 56.

Regarding the most preferred variety, 56 per cent of the farmers reported that they preferred new high yielding grafts and the rest (44%) preferred seedlings of local varieties. Steady yield, uniform size of the nuts and average weight of the nuts were the attributes that the farmers perceived as important for cashew because almost the entire quantity of nuts produced were utilized in the processing industry. The non-uniform size of the nuts, large variations in yield and irregular bearing habit were the drawbacks of non- descript types.

4.2.4.4 Pepper

The awareness of farmers about the high yielding varieties/cultivars of pepper suited to Kerala conditions and popular among the farmers of Idukki like Panniyur varieties, Sreekara, Shubhakara, Karimunda, Kottanadan, Balankotta and Neelamundi is given in Table 32. The awareness index was highest for Karimunda (96) followed by Panniyur varieties (90.67) and Neelamundi (80). For other varieties the indices were less than 50. The most preferred cultivar among the farmers was Karimunda because of its sturdiness.

Table 30. Farmers' awareness about rubber varieties n= 75

| Sl No | Variety | Frequency | | | Awareness index | Rank |
|---|---|---|---|---|---|---|
| | | Aware | Some what aware | Not at all aware | | |
| 1 | RRII 105 | 66 | 9 | 0 | 96.0 | I |
| 2 | RRIM 600 | 34 | 25 | 16 | 92.0 | II |
| 3 | GT –1 | 29 | 10 | 36 | 62.0 | III |
| 4 | PB 260 | 28 | 16 | 31 | 45.3 | IV |

Table 31. Farmers' awareness about cashew varieties n= 75

| Sl. No | Variety | Frequency | | | Awareness index | Rank |
|---|---|---|---|---|---|---|
| | | Aware | Some what aware | Not at all aware | | |
| 1 | Non-descript/Local | 67 | 8 | 0 | 92.0 | I |
| 2 | Madakkathara | 31 | 22 | 23 | 56.0 | II |
| 3 | Priyanka | 29 | 23 | 23 | 50.0 | III |
| 4 | Kanaka | 14 | 26 | 35 | 36.0 | IV |
| 5 | Dhana | 5 | 22 | 48 | 21.3 | V |
| 6 | Dharasree | 5 | 17 | 53 | 16.7 | VI |

Table 32. Farmers' awareness about pepper varieties n= 75

| Sl. No | Variety | Frequency | | | Frequency index | Rank |
|---|---|---|---|---|---|---|
| | | Aware | Some what aware | Not at all aware | | |
| 1 | Karimunda | 69 | 6 | 0 | 96.0 | I |
| 2 | Panniyur | 61 | 14 | 0 | 90.7 | II |
| 3 | Neelamundi | 55 | 10 | 10 | 80.0 | III |
| 4 | Sreekara | 19 | 32 | 24 | 46.7 | IV |
| 5 | Balankotta | 22 | 24 | 29 | 45.0 | V |
| 6 | Kottanadan | 25 | 46 | 4 | 36.0 | VI |
| 7 | Shubhakara | 11 | 18 | 46 | 26.7 | VII |

Table 33. Distribution of farmers based on awareness about varieties of selected crops

n=75

| Category | Range (index) | Crops | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Coconut | | Rubber | | Cashew | | Pepper | |
| | | F | % | F | % | F | % | F | % |
| Low | Below33.33 | 28 | 37.3 | 7 | 9.3 | 30 | 40.0 | 4 | 5.3 |
| Moderate | Between 33.33 and 66.66 | 43 | 57.3 | 36 | 48.0 | 29 | 38.7 | 51 | 68.0 |
| High | Above 66.66 | 4 | 5.3 | 32 | 42.7 | 16 | 21.3 | 20 | 26.7 |
| Total | | 75 | 100 | 75 | 100 | 75 | 100 | 75 | 100 |

### 4.2.5 Categorisation of farmers based on their awareness about varieties

The frequency distribution of farmers based on their awareness about the cultivars and varieties of the selected crops is given in Table 33.The results showed that the coconut farmers surveyed had only "low' to "moderate' level of awareness about cultivars and hybrids of coconut whereas two third of the rubber farmers were in the 'moderate' to high level of awareness about rubber cultivars. In the case of cashew farmers, 78.67 per cent was in the category of "moderate" to 'high' category of awareness about cashew varieties. More than 90 per cent of the pepper farmers were in the moderate to high level of awareness about pepper varieties.

The $\chi^2$ value on the awareness of farmers about the different varieties/cultivars of the selected crops worked out to 83.13. It was found to be highly significant at 0.1per cent probability level, which indicated that the awareness of farmers about the varieties/ cultivars of the selected crops varied. It might be due to the fact that the respondent farmers cultivated four different crops suited to entirely varying agro-climatic situations.

### 4.2.6 Quality indicators for selection of seedlings / planting materials

A farmer-customer approaching a nursery for seedlings/ planting materials selects the best one among the lot for purchase. Definitely he uses some criterion for judging the quality of the seedling. The Research system, of course, has developed some specific criterion to be adhered to while selecting the planting material of the crops. The acceptability of these criteria to the farmer as well as the presence of any new criterion being practised by the farmers is explored here.

#### 4.2.6.1 Coconut

One-year-old seedlings raised in the nursery beds are the ready to sale/purchase planting materials which a farmer going to the nursery comes across. The perceived importance of the criteria for selection of a good coconut seedling developed by the research system to the farmers is presented in Table 34.

The farmers considered the size of nuts used for raising the seedlings and age of the seedlings as the important criteria for selecting good coconut seedlings. The collar girth of the seedlings and total number of fully opened leaves were the other criteria used.

4.2.6.2 Rubber

In rubber, seedling stumps, budded stumps and poly bag plants are the materials used for planting. Farmers usually selected the stumps and poly bag plants based on the general vigour of the seedlings stumps, vigour of the bud eye, and angle of the sprout and the height of the first whorl of leaves. Ranking of the quality indicators of seedlings as perceived by farmers based on RBQ are presented in Table 35.

4.2.6.3 Cashew

About six to seven month old grafts with unwhorled taproot and scion having pencil thickness are selected from among the lot of grafts in a nursery. The preference for the quality indicators based on RBQ is given in Table 36.

Farmers' ranked 'general vigour' as the most important indicator for selection of grafts in terms of healthiness of the graft and the scion material used. Among the visible attributes were age of graft (5-6 months old grafts) and thickness of scion (pencil thickness).

4.2.6.4 Pepper

Pepper is propagated through vine cuttings. The research system has developed some criteria for selection of quality mother vines from which the cuttings are to be raised. RBQ of the quality indicators as perceived by farmers are given in Table 37.

Although the farmers had responded to the criteria given, most of the farmers believed that it was the quality of the mother vine selected that decided the quality of cuttings. The vigorous nature of the sprouted vine cuttings, stoutness of the stem and

Table 34. Quality indicators for selection of coconut seedlings

| Sl No. | Quality indicators | RBQ | Rank |
|---|---|---|---|
| 1 | Medium sized nuts | 80.4 | I |
| 2 | Age of Seedlings | 80.0 | II |
| 3 | Collar girth (10-12cm.) | 50.7 | III |
| 4 | No. of fully opened leaves | 36.7 | IV |

Table 35. Quality indicators for selection of rubber grafts

| Sl. No | Quality indicator | RBQ | Rank |
|---|---|---|---|
| 1 | General vigour | 70.3 | I |
| 2 | Bud eye | 66.7 | II |
| 3 | Height of first whorl of leaves | 53.3 | III |
| 4 | Angle of sprout | 45.1 | IV |

Table 36. Quality indicators for selection of cashew grafts

| Sl. No | Quality indicator | RBQ | Rank |
|---|---|---|---|
| 1 | General vigour | 85.1 | I |
| 2 | Unwhorled taproot | 81.6 | II |
| 3 | Age of graft | 69.9 | III |
| 4 | Pencil thick scion | 65.6 | IV |

Table 37. Quality indicators for selection of pepper planting materials

| Sl. No | Quality indicator | RBQ | Rank |
|---|---|---|---|
| 1 | Mother vine | 94.4 | I |
| 2 | Vigorous cutting | 72.7 | II |
| 3 | Healthy roots | 64.4 | III |
| 4 | Dark green leaves | 60.2 | IV |
| 5 | Stout stem | 54.2 | V |

dark green colour of the leaves were the visual criteria used by farmers for judging the quality of vine cuttings.

## 4.3 Problems and constraints in marketing of planting materials

### 4.3.1 Problems faced by agencies

An attempt was made to study the constraints faced by the various agencies in production and marketing of quality planting materials. During the study, it was realized that the agencies faced a number of problems, but only the most important ones have been enlisted. These responses have been ranked and are presented in Table 38.

Difficulty in getting quality nucleus planting materials, lack of infrastructure facilities for undertaking production and distribution, labour related issues and insufficiency of funds were the major problems faced by the agencies. An agency-wise analysis of the problems and constraints indicated that for KAU, labour related issues was the most serious problem. As far as ADF and PN were considered difficulty in getting seeds and nucleus materials was the most important problem.

### 4.3.2 Problems faced by farmers in getting planting material

The problems and constraints experienced by the farmers in getting quality planting materials of the selected crops are discussed here. The major constraints were identified based on discussions with selected farmers and extension officers during the pilot study. The respondent farmers were asked to score each of them and were then subjected to per centage analysis.

The results presented in Table 39 revealed that for all the crops, the most important constraint identified by the farmers was lack of relevant information; being 72 per cent for coconut and 70 per cent for cashew. About 54 per cent of rubber farmers and 70 per cent of pepper farmers had opined that inadequacy of information from the source was the major constraint.

Table 38. Ranking of problems and constraints faced by agencies producing and marketing planting materials

| Sl. No | Problems and constraints | Agency | | | |
|---|---|---|---|---|---|
| | | KAU | ADF | RB | PN |
| 1 | Labour related issues | I | II | II | V |
| 2 | Difficulty in getting good quality seeds and nucleus material | V | I | I | I |
| 3 | Lack of infrastructure facilities for distribution | IV | III | IV | II |
| 4 | Lack of infrastructure facilities for undertaking production | II | III | IV | III |
| 5 | In sufficiency of funds | III | III | V | IV |

Table 39. Percentage distribution of problems and constraints in getting planting materials as perceived by farmers n= 75

| Sl. No. | Crop / Constraints | Coconut | Rubber | Cashew | Pepper |
|---|---|---|---|---|---|
| 1 | Low quality | 47.3 | 59.9 | 32.9 | 52.0 |
| 2 | Lack of preferred variety | 46.7 | 49 | 33.5 | 52.1 |
| 3 | Insufficient quantity | 41.6 | 49 | 34.4 | 46.2 |
| 4 | More distance | 39.4 | 41.6 | 36.6 | 40.7 |
| 5 | High price | 39.8 | 47.6 | 27.5 | 43.8 |
| 6 | Insufficient technical support | 59.3 | 43.5 | 64.3 | 63.3 |
| 7 | Lack of trust | 44.7 | 43.1 | 28.8 | 46.6 |
| 8 | Lack of relevant information | 72.1 | 53.6 | 70.3 | 69.7 |

An agency-wise analysis of the most important constraint as reported by the sample farmers of each crop revealed that insufficient quantity, lack of relevant and adequate information about the varieties and insufficient technical support were the most important problems faced by the coconut farmers in getting seedlings from the agencies (Table 40). Similar problems existed in the case of other crops also. The distance of the source from the farmers was the major problem with the KAU as far as cashew and pepper farmers were considered.

The most important constraint in getting coconut seedlings and cashew grafts from the KB was lack of sufficient quantity of planting materials, whereas for pepper it was lack of preferred variety. Insufficiency of technical support and information on varieties were the most important constraints in getting seedlings and grafts from the private nurseries. The distance of the KAU stations was the most important constraint in getting pepper cuttings and cashew grafts as perceived by the farmers, whereas lack of information about the varieties and cultivars of coconut was the most important constraint as perceived by 77 per cent of the farmers. As far as fellow farmers were considered insufficient technical support was the most important constraint with regard to all the crops.

## 4.4 Suggestions to improve the efficiency of marketing of planting materials

As part of the study, the respondent farmers were asked to give suggestions to ensure the proper availability of good quality planting materials at reasonable price. The suggestions from researchers and scientists working on the selected crops, extension officers in the Agriculture Department and the Commodity Boards concerned and the private nurserymen were also collected. Based on the results of the study and the suggestions from the people concerned, appropriate models for the marketing of planting materials have been proposed which are discussed in the next chapter.

Table 40. Most important constraint in getting planting materials of the selected crops from the sources

| Crop<br>Source | Coconut | Rubber | Cashew | Pepper |
|---|---|---|---|---|
| KB | Insufficient quantity(76.8) | - | Insufficient quantity(78.8) | Lack of preferred variety (75.2) |
| PN | Lack of information on varieties(77.6) | Insufficient technical support (69.3) | Insufficient technical support (82.27) | Lack of information on varieties(77.5) |
| KAU | Lack of information on varieties(77.1) | - | Distance (81.2) | Distance (79.3) |
| ADF | Insufficient technical support (60) | Distance (66.4) | Lack of information on varieties(67.2) | Lack of information on varieties(68.4) |
| FF | Insufficient technical support(67.5) | Insufficient technical support(48.5) | Insufficient technical support (79.5) | Insufficient technical support(77.8) |

(Figures in parenthesis show per centage of response)

# Discussion

# 5. DISCUSSION

This chapter deals with the discussion on the results obtained considering the objectives of the study. The chapter is divided into four parts. In the first part the various organizations engaged in the production of planting materials and the marketing practices adopted by them are discussed. The source and variety preference of the farmers for planting material and the factors influencing such preferences are discussed in the second part. In the third part, the problems and constraints faced by the organizations in the production and marketing of planting materials are discussed in relation with the problems faced by farmers in getting quality planting materials. Appropriate marketing models derived from the findings of the study and evolved from discussion with extension officials are presented in the fourth part.

## 5.1 Marketing practices of organizations

The marketing practices of planting material producing and distributing agencies in Kozhikkode, Kottayam, Kannur and Idukki representing Coconut, Rubber, Cashew and Pepper respectively were studied in detail.

Coconut Nursery, Thikkodi under the State Department of Agriculture and private nurseries were the organizations undertaking production of coconut seedlings in Kozhikkode district. Although there were four nurseries under the Department of Agriculture, excepting Coconut Nursery, Thikkodi others do not produce coconut seedlings. The KAU and the Coconut Development Board (CDB) do not have farms or nurseries in Kozhikkode district. But the KAU farms and Demonstration cum Seed Production (DSP) Farms of the CDB situated in other districts undertook production and distribution of coconut seedlings.

In the case of rubber, the Rubber Board was the only Government agency engaged in production and distribution of planting materials of improved cultivars. A widespread presence of privately owned nurseries was observed in the study area. The Board also selectively sponsored private nurseries with a view to improve the

availability of quality planting materials. In order to meet the twin objectives of promoting quality and regulating general market price, the Board undertakes production and distribution of planting materials to a limited extent. The Central Nursery at Karikkattoor is the Rubber Board nursery existing in Kottayam district, the study area with respect to rubber. The KAU and the Department of Agriculture are not at all undertaking production of planting materials of rubber. Hence in the case of rubber, the Central Nursery, Karikkattoor and the private nurseries in Erattupettah Block of Kottayam district had been studied.

The District Agricultural Farm, (DAF) Taliparamba under the State Department of Agriculture, the Central State Farm at Aralam and private nurseries undertook production and distribution of cashew grafts in Kannur District. The KAU do not have any cashew graft production centre in the district. The Cashew Research Stations, Madakkathara and Anakkayam under the KAU which are actively engaged in production of quality cashew grafts of high yielding varieties were situated in Thrissur and Malappuram districts respectively.

Pepper occupied the maximum area in Idukki district. The District Agricultural Farm (DAF), Arikuzha, State Seed Farm (SSF), Karimannoor and State Vegetable Farm (SVF), Vandiperiyar in Idukki district produced rooted pepper cuttings.

All the three farms are under the Department of Agriculture. Although the Cardamom Research Station at Pampadumpara under the KAU was situated in this district, rooted pepper cuttings were not produced and sold from there. The Pepper Research Station (PRS) of KAU is situated at Panniyur in Kannur district. The Indian Institute of Spices Research (IISR), which undertakes research on spices including pepper is situated in Kozhikkode district. They are actively involved in the crop improvement programmes in pepper and had released many promising cultivars and varieties. Although the Spices Board was having a nursery at Udumbanchola, which produced rooted pepper cuttings, now a day they were paying more attention to other spice crops. Private nurseries and farmers themselves were the major producers of planting materials of pepper as far as Idukki district was considered.

The State Department of Agriculture has established seeds and planting material production centres in all the districts. Apart from the District Agricultural Farms (DAF), there are seed farms dealing with the production of seeds and planting materials of specific crops in all districts. The production details of planting materials from all the farms in the State showed that during the year 1999-2000, 45650 WCT, 79209 Tx D and 46484 DxT coconut seedlings, 5910168 pepper cuttings and 292323 cashew grafts were produced and distributed. The pepper varieties included Panniyur and Karimunda and cashew comprised of Anakkayam, Priyanka and Dhana varieties. (Source : Director of Agriculture, Thiruvananthapuram) The list of farms/nurseries in the study area is given in Appendix – III.

The KAU has set up research stations dealing with specific crops in addition to the Regional Research Stations at each NARP zone. The farms attached to all these research stations undertook production and marketing of planting materials of commercial crops and ornamental crops. Apart from this, the Plant Propagation and nursery unit at the headquarters, Vellanikkara also undertook commercial production of planting materials. The Agricultural Technology and Information Centre (ATIC) situated at Mannuthy in Thrissur district was the major distribution and sales outlet of planting materials produced by the University.

The Commodity Boards dealing with the crops under study are the Rubber Board, the Coconut Development Board and the Spices Board. The Rubber Board with its headquarters at Kottayam is a statutory body constituted under the Rubber Act, 1947 which undertakes all measures to promote rubber cultivation and rubber industry in the country. Apart from the Central Nursery situated at Karikkattur in Kottayam district, there are seven regional nurseries situated elsewhere in Kerala (Appendix - IV).

The Government of India established the Coconut Development Board, a statutory organization in 1982 for the integrated development of coconut cultivation and industry in the country. The Demonstration cum Seed Production (DSP) farms at Neriyamangalam (Ernakulam district) and Vellanikkara (Thrissur district) had been established by the Board to ensure the availability of quality coconut planting materials.

The DSP Farm, Neriyamangalam was established during 1991-92 and 68000 seedlings had been produced and distributed from the commercial nursery of the farm till date. During the year 1999-2000, about 14000 seedlings hade been produced which included 5000 D x T seedlings. The rest were WCT seedlings. The DSP Farm, Vellanikkara started commercial production and distribution of seedlings since 1999-2000 only and in that year about 3000 D x T seedlings were produced. The physical targets of production of coconut seedlings for the DSP farms were linked with the Development Programmes like Area Expansion under Coconut where new planting assistance to the tune of Rs. 8,000 per hectare was given. The programme was being implemented through the Krishi Bhavans under the State Department of Agriculture. (Singh and Chinnaraj, 2000)

The Spices Board, another statutory organization, was set up for the integrated development of spices industry in the country. Kerala being the major spice growing state, the headquarters of Spices Board has been set up at Cochin. The Spices Board produced and distributed seedlings and planting materials of crops like cardamom, pepper, arecanut, clove, nutmeg and vanila, through its nurseries situated at Munnar and Udumbanchola. Under the Western Ghat Development Programme, certified nurseries had been set up at farmers level for producing rooted cuttings of high yielding pepper varieties. The Board has been promoting high yielding varieties like Panchami, Pournami, Sreekara, Subhakara and Panniyur 1-5 through its schemes.

The Directorate of Cashewnut and Cocoa Development at Cochin is engaged in the development of cashew industry and its cultivation in the country. The Directorate has established seven Regional nurseries in Kerala to generate clonal planting materials. Out of these four are in the Government sector and three in the private sector. But the Directorate directly ran none of these regional nurseries. They were being managed by the respective parental organization. Only the funds for establishing the nurseries had been provided by the Directorate. (The list of approved cashew nurseries in Kerala is given in Appendix - IV).

Although the farms in the Government sector have been undertaking production and distribution of quality seedlings and planting materials of crops, they were able to meet hardly 20 per cent of the total planting material requirement of the state. The private nurseries played the key role in the production and marketing of planting materials. But these private nurseries mostly dealt with ornamental plants. Private nurseries dealing with the crops selected for the study in the respective districts were few in number and many of them were not willing to give details. Hence only 30 private nurseries have been surveyed.

The existing marketing practices followed by the above-mentioned organizations were discussed in terms of product mix, pricing, placing and promotion in the ensuing paragraphs.

### 5.1.1 Product mix

Seedlings and planting materials of almost all the important crops were produced by the agencies under study. The product mix of the agencies studied was given in Table 2. The farms under KAU, Agriculture Department and the private nurseries produced seedlings of coconut, rooted pepper cuttings, cashew grafts, arecanut seedlings, seeds of vegetables and planting materials of ornamental plants. Private nurseries excepting those specialized in rubber gave importance to ornamental plants and fruit trees. The production of planting materials of a variety of crops could be regarded as equivalent to the product mix concept of a marketing firm.

Production of seedlings of WCT, T x D and D x T hybrids by the same farm may be considered as the product lines in coconut seedlings. The ADF and the KAU farms produced the product lines of coconut. PN produced mainly WCT seedlings alone and they procured seedlings of hybrids from other sources like CPCRI.

Clones of RRII 105, RRIM 600, GL-1, etc., produced at the CN, Karikkattoor of the Rubber Board represented the product line of rubber.

Rooted cuttings of different varieties of pepper like Panniyur 1-5, Karimunda, Neelamundi, etc., represented the product line of pepper produced by the farms and private nurseries. A perusal of Table 5 showing the selling price of planting materials indicated that the same item was priced differently by the different agencies. The selling price charged by private nurseries was found to be less than that of agencies. The results on farmers' preference for varieties presented in 4.2.4 indicated that in the case of coconut, WCT was the most preferred variety. Similarly, for rubber, RRII 105 was the preferred variety. In the case of cashew, although grafts were the approved planting material, about 44 per cent of the farmers preferred seedlings of elite local cultivars. Even though the KAU and IISR had released many high yielding pepper varieities, the farmers in the study area preferred the local cultivar, Neelamundi. The farmers' preference towards source presented in 4.2.1 indicated that for coconut and pepper, fellow farmers were the most preferred source. For cashew, KAU and for Rubber, the RB was the most preferred source. These results showed that even though the PN had priced the planting materials low, the farmers never preferred them. So the product line of crops should be chosen taking into consideration the market demand and preference for varieties/cultivars.

Farming business being exposed to uncertainty and risk, farmers always tried to shift from one crop to another, which ruled the market. The plight of cocoa farmers in the 1980s and rubber farmers in the 1990s were striking examples in this regard. The farmers could not be blamed for that behaviour. The PNs all over Kerala who switched over to producing planting materials of rubber due to higher price realization in 1995-96, are in deep trouble today. According to them the sharp fall in the price of natural rubber (Rs. 52 per kg in 1995 to Rs. 29 in 1999) has adversely affected the planting material business due to decline in the area under new planting. So many private nurseries were forced to destroy the excess stock, which resulted in huge monetary loss to them. However the reputed and experienced nurseries in the field reported that there was not much reduction in their sales as claimed by small nurseries.

Although the Rubber Board also produced planting materials of rubber, the low demand in Kerala due to fall in price of natural rubber never affected the Board

adversely as they could transfer the excess stock to the non-traditional areas and parts of Maharashtra and North Eastern States as part of their development schemes.

So we may conclude that to cope with the fluctuating trends in the demand for planting materials arising as a result of price variations in the commodity market it would be better if the planting materials producing agencies produced seeds, seedlings and planting materials of diverse crops rather than stick on to one or two crops. The production policy of the organization should be streamlined to the market trend and demand of the farmer- consumer.

5.1.1.1 Production Policy

Production policy encompassed planning and organizing production, quality monitoring, procurement and storage of seedlings and planting materials by the agencies. Production could be carried out in two ways – centralized or decentralized. In centralized production, the production will be undertaken at the main production centre itself under the direct supervision of the farm manager or the proprietor. There will be pooling of the resources of production. Whereas in decentralized production, the production will be carried out in a different locations, by giving sub-contracts to small units or individuals. It has the advantage that less land is sufficient but uniformity and quality cannot be ensured. Usually, the sponsoring nursery will supply the stock and scion or the seed material.

The production policy of the various organizations was studied which showed that all the agencies in the Government sector; the KAU, the ADF and the RB followed centralized production. About 87 per cent of the private nurseries followed centralized production and the rest, 13 per cent resorted to decentralized production wherein the families and local labour in and around the production centre would be used for preparing the planting materials. This practice was more prevalent in the case of ornamental plants. Although the quality of the planting material produced was questionable, the practice was found to be cost effective.

The study revealed that none of the agencies undertook market survey before planning their production strategy for the ensuing year. Nevertheless, the pulse and trend in the agriculture scenario prevailing was taken into consideration before deciding on the type and quantity of planting material to be produced. The farms in the public sector including the RB farm resorted to production before the planting season, whereas the private nurseries followed continuous production.

An investigation into the nature of business of the agencies revealed that most of the agencies undertook three different types of business, production and distribution, production, procurement and distribution. The first category undertook both production and distribution of planting materials to the farmers. Most of the agencies studied came under this category. In the second category, production and distribution of planting materials as well as procurement and distribution was undertaken. Out of the 30 private nurseries studied 13 (43 %) undertook distribution of whatever material produced by them and about 17 nurseries (57%) resorted to procurement of those materials, which they were not producing, from other sources and distributed to the farmers. KAU always distributed the materials produced by its farms and research stations and never resorted to procurement. The State Department of Agriculture at times resorted to procurement from other sources (15%) and distributed through the 'Krishi Bhavans'. They procured materials from the KAU as well as from some private nurseries of reputation. The only condition for the procurement from KAU was that the materials need to be transported at the cost of the Department. The procurement price from the KAU would be fixed on par with the prevailing selling price. None of the agencies studied undertook distribution alone.

5.1.1.2 Production planning

The capacity and capability of the manager of the farm/ nursery greatly influences the efficiency of the farm. The educational qualifications and experience of the manager could be considered as surrogates of the capacity and capability. The educational qualifications of the mangers in the agencies studied were presented in Table 3. A post-graduate degree in agriculture with specialization in any branch of agriculture was the minimum qualification to be the in charge of farms under KAU.

Ph.D holders in Agriculture, who were in the Associate Professor Cadre, headed both the farms under KAU, which had been studied. Farm Assistants and Technical Assistants holding diploma/degree in agriculture assisted the heads of farms and nurseries under KAU. Although the minimum qualification for the farm-in-charge of ADF was a degree in Agriculture, post-graduates in Agriculture were managing three of the four farms surveyed. In the ADF also, Agriculture Assistants holding diploma in Agriculture assisted the farm-in-charges. In the RB Central Nursery at Karikkattur, a post-graduate in Botany was in charge of production. Persons without professional qualification managed most of the private nurseries (83%) whereas technically qualified persons holding vocational degree in Agriculture were managing four nurseries.

The experience of the farm managers was another important criterion that decided the efficiency of a farm/nursery. The farm managers of KAU had about 3-5 years of experience as production managers, whereas in the ADF, the experience varied from 'less than one year' to 'more than 5 years'. The Farm Officer of Rubber Board also had 3-5 years of experience in nursery management. The private nurseries on the other hand, had minimum 10 years of experience in the field and many of them had been continuing their family business.

None of the farm managers studied had received any in service management training except for the farm management course at the graduation level. At least in some of the state department farms less experienced hands had been put in charge. It was observed that more than the educational qualification acquired, as far as private nurseries were concerned, it was the aptitude and experience in the field that was the crucial factor deciding the efficiency.

The factors influencing production planning other than the technical capability of the farm managers presented in Table 4 indicated that availability of sufficient funds was the most important factor influencing the production decision as far as the ADF was considered. For ADF, the demand for the department schemes was the next important factor. Aptitude of the farm-in-charge and quality considerations of the materials produced ranked foremost place as far as KAU was considered. The RB and

PN had given first rank for the demand in the market. The demand for the departmental scheme, the World Bank assisted Rubber Production and Development Scheme was the second important factor, which influenced the production decision followed by quality of the planting material. The aptitude of the nurserymen and the availability of parent seed material were the second and third important deciding factors. Quality considerations and availability of seed materials were given third place. The ADF and the Rubber Board gave due consideration to the availability of schemes as they could distribute the seedlings and planting materials through those schemes.

Only the PN took autonomous decisions about the production matters. In the case of all Government agencies, the target for production was fixed by the higher authorities and communicated to the farms. The farm managers in the ordinary course did not enjoy authority to change the quantity assigned for production at the farm level. This system had been followed as part of the bureaucratic procedure. Recently some changes have been effected under the Panchayat Raj System in the Nineth Plan when planning had been initiated at the grass root level. Examples for establishing nurseries at the Panchayat level utilizing the Nineth Plan Fund could be found elsewhere, though not in the study area.

From the observations it could be inferred that with regard to farms in the Government sector, the production decisions were mostly in accordance with the policy taken at the higher level and market demand and farmers' preferences were given least consideration. But private agencies enjoyed absolute freedom to take decisions based on demand and fund availability. The farms in the Government sector may be given more freedom to make their own decisions in production matters, taking into consideration the local demand, budget allocation and availability of other resources. Necessary changes in the organizational and management set up need to be incorporated to achieve that goal.

### 5.1.2 Price Analysis

From the consumers' point of view, the price offered for a commodity is the value that the consumer assign for the satisfaction obtained and from the producers'

point of view; price is the cost of production and a margin the producer keep for undertaking the risk of production. The results presented in Table 5 revealed that the selling price fixed by various agencies for the same material was different. The selling price of WCT coconut seedlings was Rs. 18 per seedling in ADF and PN; whereas in KAU the price was Rs. 22 per seedling and in the CDB farms, it was Rs. 20 per seedlings. The hybrid seedlings had been priced higher than WCT seedlings. The difference in price of WCT seedlings and hybrids arouse due to the difference incurred in the production of WCT seed nuts and hybrid nuts. The CDB farms charged Rs. 38 and Rs. 21 for D x T and T x D seedlings respectively and the KAU has fixed the selling price of hybrids at Rs. 45.

The difference in price charged was attributed to the difference incurred in the cost of production of seedlings. The mother seed nuts for producing coconut seedlings were procured from the root (wilt) disease free areas north of Thrissur district. The cost of production of coconut seedlings invariably included the cost of seed nuts, the cost of maintenance of the seedling nursery and other related expenses in terms of labour and material inputs. The KAU farms studied were not producing coconut seedling, and hence their cost of production was not obtained. For the ADF in Thikkodi, the cost of producing a coconut seedling worked out to Rs. 15-16 including seed nut cost. The State Department of Agriculture had a well-established seed nut procurement mechanism for procuring coconut seeds. The seed nut collection from selected mother palms was done during the months of January to March every year. The harvested nuts had to be carefully handled, till they reached the farms. The KAU farms used to procure seed nuts from the State Department of Agriculture and also directly from the farmers, adhering to the standards for selection of mother palms and seed nuts.

The CDB collected WCT seed nuts from the Department of Agriculture and T x D and D x T seed nuts from the CDB farm at Mandya in Karnataka. This factor resulted in the difference in production cost of WCT and hybrid seedlings, which in turn was reflected in the differences in price.

The price for cashew grafts was common for KAU and ADF. The private nurseries usually priced lower than the ADF and KAU. The results of the factors influencing farmers' preference to sources also confirmed the observation that even if the price was high, farmers preferred KAU varieties; because farmers were not ready to compromise quality for price. The results in 4.1.5 confirmed the above observations.

As for rubber, the Board nursery charged lower than the private nursery. For budded stumps according to Board officials, even though the cost of production was higher, they were selling at subsidized rate of Rs. 5-6 per budded stump. The production cost in Rubber Board farms were on the higher side as it included the establishment and supervisory charges. Even though the actual cost would be much higher, in order to control or regulate the open market price, the Board has been selling at subsidized rates, the extent of subsidy varying between 75 to 80 per cent. As the private nurseries do not have to bear the huge establishment cost, they could produce seedlings at lower cost. Hence, in order to prevent them making huge profits and avoid exploiting the farmers, the Rubber Board has followed subsidised rates.

Many a times the farmers had expressed their willingness to purchase planting materials even by paying a little higher price if the quality was assured. The results of factors influencing the farmer's preference to various sources presented in 4.2 also confirmed the above observation. From the above observations we could infer that if planting materials of good quality could be supplied to farmers, they won't mind even if they were priced a little high. In this context, it could be observed that even though the Government agencies were able to meet less than 20 per cent of the total demand for planting materials, their presence in the field had been a strong factor in holding down the open market price.

5.1.2.1 Price determination

The methods and procedures followed for price fixation was different in the various organizations. The observations in 4.1.5 showed that the KAU, ADF and the RB followed 'Break- Even' method for selling price fixation. All the others followed the 'Cost plus' concept in fixing up the selling price.

Close examination of the pricing mechanism of the Government agencies revealed that although the basic principle was the same, the procedure for fixing up the selling price of planting materials varied with the crops. In the Department of Agriculture, for most of the crops, the Director of Agriculture fixed the prices of planting materials on par with the rates of National Seed Corporation and the KAU. But in the case of coconut, the department followed a specific procedure. A separate wing under a Joint Director in the Department of Agriculture looked after the affairs of the farms including fixing the prices of planting materials.

The whole process of price determination started with the fixing of the procurement prices of coconut seed nuts. The procurement price of seed coconut would be finalized in a meeting of the representatives of farmers, agricultural labourers, peoples' representatives from local bodies and the officials concerned in the Department of Agriculture. The "Procurement price fixation committee" meeting would be convened by the Joint Director (Farms) in the month of December every year and would be held in Kozhikkode district. The procurement price of seed nut was determined based on the procurement price for 'copra' fixed by the Government for the year and the additional labour charges incurred for harvesting and loading in to trucks. Hybrid seed nuts would be priced 15 per cent more than WCT seed nuts. The procurement price fixed by the Committee would be recommended to the Director of Agriculture for formal approval.

The procured nuts would be allotted to the department coconut nurseries for sowing and raising seedlings. Usually the seed nuts would be collected during the months of January to April and sown in the beds during June. The selling price of coconut seedlings for every year would be fixed considering the expenses incurred for raising seedlings in the nurseries, including cost of procurement of seed nuts and establishment charges. The selling price of seedlings would be tentatively fixed adopting Break- Even method, by the Director of Agriculture and would be submitted to the Government for final decision.

Usually the actual cost of production per seedling would be high (Rs. 32.35 per WCT & Rs. 39.35 per hybrid seedlings during 2001-02) but upholding the fact that the main purpose of departmental farm was to produce and supply quality seedlings at reasonable rate and to save farmers from planting poor quality seedlings supplied by various private nurseries, the Director of Agriculture fixed the selling price of coconut seedlings at a reasonable rate and submitted the proposal to the Government. In the case of coconut seedlings, the price was finally declared by the Government and for all other crops; the Director of Agriculture fixed the selling price.

But such well-established system of pricing does not exist for other crops in the Department of Agriculture. The price of planting materials of cashew was fixed by a Technical Committee comprising of an expert from KAU, an official at the Directorate of Cashew & Cocoa Development and officers in charge of the farms, which would be chaired by the Director of Agriculture. For all other crops including pepper the selling price of planting materials were fixed at the meeting of the officers in charge of the farms convened by the Joint Director of farms.

The ADF undertook production of planting materials mainly to cater to the requirements of departmental schemes. (Table 4). Specific schemes were operating in the Agricultural Department for the development of Cashew and Pepper. The various schemes for the development of cashew for the year 1999-2000 were the state scheme on Cashew Development Programme and centrally sponsored Integrated Development Programme of Cashew. Under the State Scheme, Cashew grafts at the rate of 200 number per hectare was supplied free of cost to farmers, public and private institutions with the intention to bring more barren and uncultivable land to arable condition. The supply of cashew grafts was arranged from ADF and other approved nurseries and was monitored by the Cashew Development Officer attached to the Principal Agricultural Officer's Office, Kozhikkode. Under the centrally sponsored scheme input assistance was provided to farmers for the initial three years of establishment of new cashew plantations with high yielding varieties such as Madakkathara – 1, Madakkathara – 2, K-22-1, Dhana, Priyanka, Anagha and Akshaya. Cashew grafts were supplied at a subsidized rate of Rs. 12 per graft. The Deputy Director of Agriculture (NWDPRA)

was designated as the Nodal Officer at the District level to review the progress of the scheme.

The specific schemes for development of pepper for 1999-2000 included, Technology Mission of Pepper and the Centrally Sponsored Scheme on Integrated Programme for Development of Spices (IPDS). As part of the Technology Mission on Pepper, the physical target for producing rooted pepper cuttings for the year 1999-2000 was fixed at 50 lakhs. Production and distribution of quality rooted pepper cuttings at subsidized rates was the major component of the IPDS and for the year 1999-2000 the target was to produce 100 lakh-rooted cuttings. The cost of production per rooted cutting was estimated as Rs. 1.50 and the cuttings were distributed to farmers at 50% cost realizing an amount of 75 paise per cutting. Another component of the IPDS was the establishment and maintenance of field demonstration plots intended to motivate the farmers to adopt improved management practices and to popularize high yielding varieties of pepper. As part of this, 100 pepper cuttings were supplied free of cost to farmers for raising one demonstration plot @ two cuttings per standard. During the year 1999-2000, 1000 demonstration plots were established. In order to encourage farmers to grow HYV of pepper as mono-crop utilizing ideal live or dead standards an area expansion programme for pepper was also taken up as part of IPDS. (Source: Government of Kerala, Annual Plan 1999-2000).

All these schemes were implemented through the KBs and hence generally the selling price of planting materials distributed through the KBs varied depending upon the schemes through which they were distributed.

In the KAU, the selling price of planting materials was fixed by the Director of Research taking into consideration the production cost, on a Break- even basis. The Associate Director (Farms) would convene a meeting of the Farm- in-charges of the Research stations and the Plant propagation unit on behalf of the Director of Research and the selling price of planting materials was fixed giving due weightage to the production cost. As KAU was not implementing development schemes of any kind, they did not undertake sale of planting materials at subsidized rates.

In the Rubber Board, the prices of the planting materials was fixed every year based on Break- Even concept after due cost estimation. A committee comprising of the officers in charge of the nurseries under the chairmanship of the Joint Rubber Production Commissioner (Extension) would decide upon the price to be fixed based on the cost of production for raising green budded stumps. The recommendation of the Committee would be approved by the Chairman of the Board and communicated to all the Board nurseries as the selling price of planting materials of rubber for that year. If the production cost were too high, the Board would lower the price by extending some amount of subsidy to small growers for the planting materials distributed through the schemes in the Regional Offices. As claimed by the Board officials, the actual cost of production per budded stump worked out to Rs.5-8 including the establishment and supervisory charges. But the Board had fixed the selling price at Rs.4 and Rs.6 for Green budded stumps and Brown budded stumps respectively so as to contain the unscrupulous private nurseries from charging exorbitant price. The RB usually supplied the planting materials at two prices - small growers received supplies at concession rates and the large growers at cost price.

According to the Rubber Board officials, even though the supply was far below the demand, as they were in the picture, they were able to hold down the market price of planting materials of rubber. The private nurseries fixed the price only at par with the Rubber Board rates. As the private nurseries were free to take autonomous decisions, they could make appropriate changes in the price of planting materials in accordance with the changes in the market price and demand for natural rubber.

### 5.1.3 Channels of distribution

Every producer needs a link with the consumer to sell his products. The common channels and outlets through which the organizations under study distribute the planting materials were presented in 4.1.6.

Majority of the sales from the research station farms under KAU was effected through the sales outlet of the stations to the farmers. About 45 per cent of the sales

were effected through this channel. Fairs and exhibitions contributed 35 per cent of the sales of planting materials from KAU. About 15 per cent of the total sales was done through the Agricultural Department. The ATIC (Agricultural Technology Information Centre) functioning at Mannuthy near Thrissur was intended to serve as a single window facility for extending knowledge, skill, quality planting materials, processed products and related services in agriculture to the farming community. As far as the Agricultural University is considered, in general, the ATIC served as the most important channel for distribution of planting materials. The positioning of ATIC, its proximity to NH- 47, the display of materials, everything contributed to good sales volume at the centre. About 45 per cent of the total sales of planting materials of the University were through the ATIC. The ATIC does not produce any material but only distribute the materials supplied by other farms and research stations of KAU. The ATIC also offered a 'help line' service – dedicated telephone to clarify farmers' queries regarding availability of quality planting materials of crops; their production problems etc. The centre also undertook postal despatch of vegetable seeds, KAU publications, mushroom spawn, etc., to the benefit of the farmers.

The farms under the department of Agriculture undertook production of seeds and planting materials mainly for meeting the requirement of the departmental schemes. The planting materials would be transported from the seed/district farms and distributed to the Krishi Bhavans by the vehicles owned by the Principal Agriculture Officer (PAO). About 60 per cent of the distribution was effected through this channel. About 10 per cent of the planting material was given to farmers through fairs and exhibitions and another 15 per cent was sold over the counter to the farmers. The Central State Farm, Aralam owned a mobile sales unit, which distributed 15 per cent of the planting materials produced by them. No other agency studied was having mobile unit for distribution of planting materials.

The Rubber Board distributed the planting materials directly to the farmers. They made use of railway and steamers to transport budded stumps to non-traditional areas of rubber cultivation like north-eastern states. The bud wood, seedling stumps and budded stumps were packed individually in fresh banana sheath or rolled in fresh

damp coconut fibre before despatch in order to avoid bruising and drying of buds during transit. The cut ends of the stem and root would be sealed with wax. The Rubber Board followed a well-defined procedure for distribution of planting materials. The Rubber Board Central Office invited applications for planting materials from farmers through press advertisements. The Development Officers in charge of the Regional Offices received the applications and effected allotment as per prescribed norms. The price was received in advance before effecting supplies.

Private nurseries mainly followed direct sales to farmers. More than 50 per cent of the sales were carried out in that manner. Some reputed private nurseries also received orders from the Agricultural Department as well as from the Local Bodies for producing and supplying planting materials. During May-June-July months it is a regular scene in rural areas that vendors carry the seedlings of ornamentals and fruit trees in bicycles to the farmers' doorsteps. About 20 per cent of their business was conducted in this manner.

The results of the study conducted by Jalan (1987) revealed that the most popular agency active in the field of seed distribution in Gorakhpur district of UP was private traders followed by co-operatives and seed centres of Agriculture Department. The findings of the present study also revealed that private nurseries were the most popular agency in the distribution of planting materials.

### 5.1.4 Promotional methods used by agencies

Promotion plays a key role in the marketing strategies in the case of consumer products. But in the agricultural sector except for processed food products and inputs like pesticides and fertilizers, promotion was not seen adopted extensively. The results in Table 6 presented the important media used by the agencies to disseminate information on planting materials. The Government agencies adopted publicity measures for dissemination of information. The KAU gave announcements about the availability of planting materials and seeds through the `All India Radio'. These announcements were broadcast during the morning and evening 'Farm and Home' programmes of the AIR. The University publication `Kalpadhenu' also carried the

information about the availability of planting materials and seeds and their cultivation practices during the planting season. The use of television as a medium for disseminating the information about the availability of planting materials was not found in the survey.

The ADF used radio as the main media for disseminating information, followed by field officials in the department and print media. The Officers in charge of the farms gave the information, which would be broadcast in the 'Farm and Home' programme.

The Rubber Board mainly made use of their Regional office and field staff to inform the farmers about the availability of planting materials. Print media was ranked second. This included advertisements in popular dailies and 'Rubber Magazine.' The Rubber magazine is the monthly publication of the Rubber Board.

Banners and posters were the main methods of promotion used by private nurseries. About 70 per cent of the private nurseries used banners and posters. Advertisements in newspapers and farm periodicals were used by 27 per cent of the PN. Slide shows in the local theatres were another unique promotional method adopted by private nurseries. Slide shows were adopted by 27 per cent of the PN for disseminating the information. About 50 per cent of them used more than one media for disseminating the information. This was supported by the findings of Rajasekharan (1991). He observed that only 33.33 per cent of the seed-marketing firms in Coimbatore used sales promotional activities, like pamphlets, cinema slides and newspaper advertisement.

Private nurseries alone were adopting point-of-purchase incentives. Five out of the 30 nurseries contacted reported that they gave one or two seedlings in addition, for bulk orders. Such sales promotion methods were not practiced by any of the agency in the public sector. The private nurseries practiced it not as a promotion strategy but to compensate the losses that may arise in the course of transportation.

Promotion methods included both publicity and advertisement. In the strict sense radio broadcasts and news items in the weekly 'Karshikarangam' columns of dailies were unpaid and came under the category of publicity by the agencies. Generally, the publicity was used by Government agencies. The private nurseries used promotional activities like banners and cinema theatre slide shows to disseminate the information on the availability of planting materials.

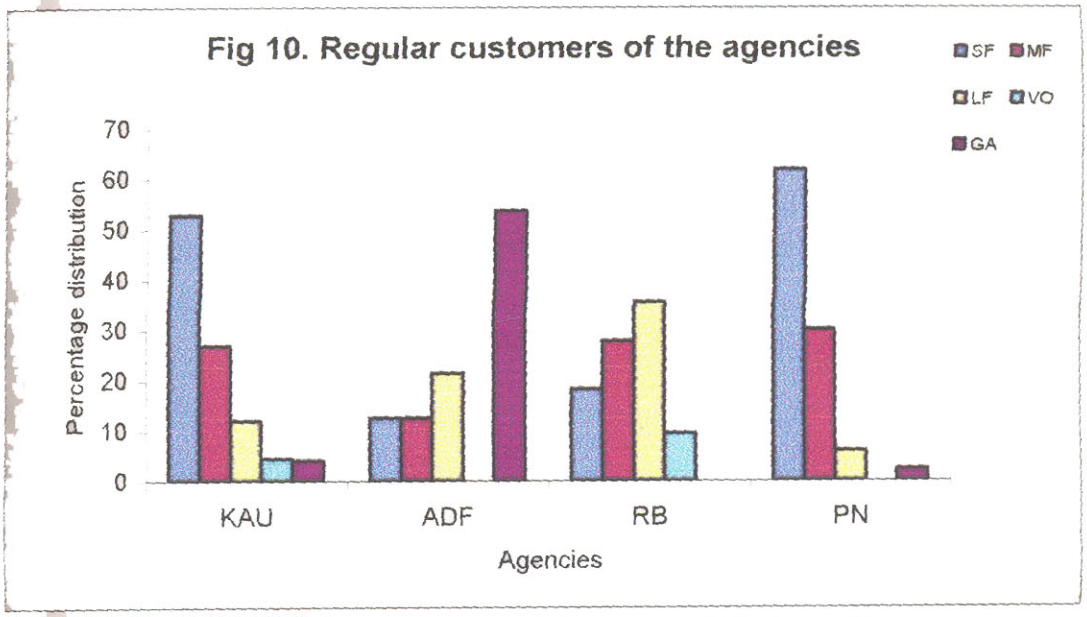
Some of the farmers in their discussion complained that even if they travelled long distances to buy planting materials of the preferred variety, the Government agencies never gave one or two seedlings free, while the private nurseries either gave free seedlings or priced them low if the volume of purchase was more. In the transit it was quite possible that some seedlings/grafts might get damaged. Hence the possibility of providing –point of - purchase incentives could be looked into if the order was large.

### 5.1.5 Customer profile

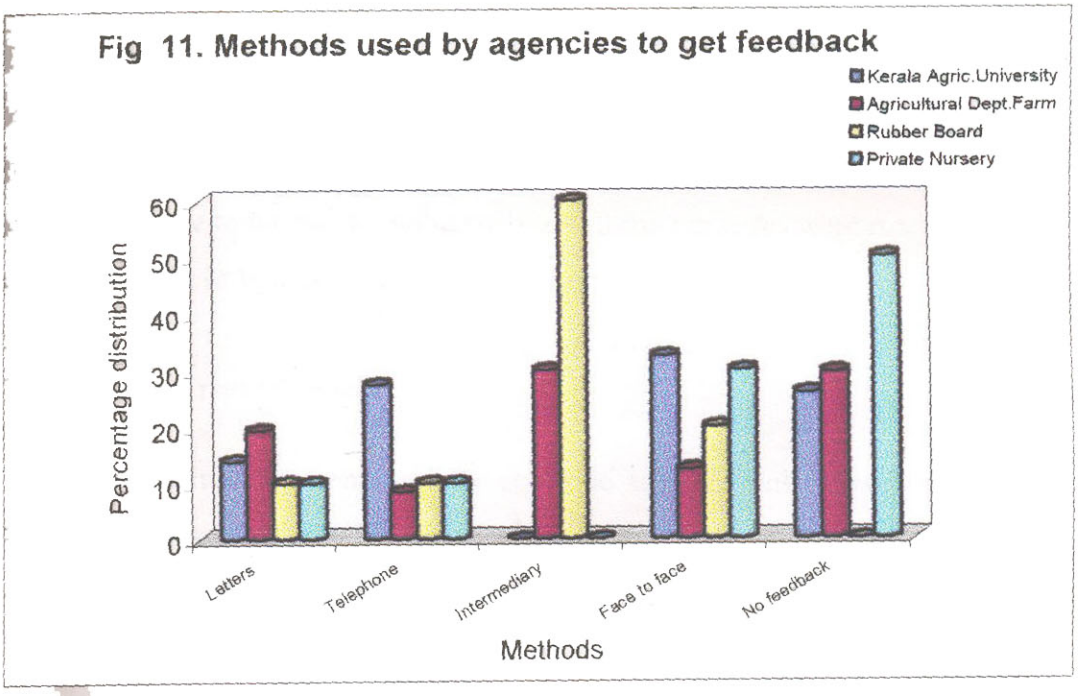
The composition of regular customers of the various agencies who bought seeds and planting materials was given in Table 7. For the KAU, 53 per cent were small farmers followed by marginal farmers (27%) and large farmers (12%). Voluntary organizations and Government departments constituted another 8 per cent of the customers.

However in the case of ADF, the department of agriculture itself was the major customer (54%) followed by large farmers (21%). Small and marginal farmers together constituted 25.0 per cent of the customers. Whereas large farmers constituted 36 per cent of the customers of the Rubber Board followed by marginal farmers (29%) and small farmers (18%).

About 60 per cent of the regular customers of private nurseries fell in the category of small farmers, followed by marginal farmers (30%) and large farmers (6%). About two per cent of the planting materials produced by private nurseries were being supplied to government agencies.




*SF – Small Farmer* *MF – Marginal Farmer* *LF – Large Farmer*
VO – Voluntary organization GA – Government Agency



### 5.1.6 Support services to farmers

The analysis of the marketing efficiency of planting material production sector would be complete only with an attempt on the support services provided to the customers and the feed back from the customers. The support services provided to farmers by the agencies was of the nature of providing technical advice on cultivation practices of the crops. The results in 4.1.9 showed that support services provided by all the agencies was of the nature of giving technical advice alone, except in the case of Rubber Board. The KAU farms reported that in 50 per cent of the cases they gave technical details voluntarily when farmers came to purchase planting materials and in 50 per cent cases gave the details only on request. In the case of Rubber Board, all the information on cultivation details was given to the farmers. All categories of farmers who planted rubber would be covered under the Rubber Production and Development Scheme of the Rubber Board. The field officers of the Rubber Board would provide the necessary technical guidance for the cultivation of rubber.

PN generally would not give any advice on cultivation practices and about 33 per cent of them provided advices on request. It had been already reported that 25 out of 30 private nurseries surveyed were having non-graduates as the managers but they had enough experience in the field. The managers were not technically competent to provide information about cultivation practices. About 13 per cent of the private nurseries gave advice to the farmer voluntarily and those nurseries were run either by an agricultural graduate or by a retired agricultural assistant.

### 5.1.7 Feed back from farmers

The performance of any activity could be assessed only if we collected the feedback. Several methods could be employed to collect the feedback from the farmers. In order to assess the performance of the seedlings and grafts supplied, it is necessary to collect the feed back from the farmers. But the majority of the agencies studied were not interested in collecting feedback. However, an enquiry about the percentage contribution towards mode of collection of feedback given in Table 9 showed that the KAU got the feedback from the farmers through first hand information (33%) and

through telephone calls (28%). Letters from the customers constituted about 14 per cent of the method for collecting feed back. In the case of ADF, 69 per cent of the feedback was obtained indirectly through the Krishi Bhavan officials. Letters and telephone calls contributed to about 28 per cent in collecting the feedback. About 30 per cent was obtained indirectly from the field level officers working in the Agricultural department. No feedback was collected in 30 per cent of the cases.

In Rubber Board around 60 per cent of the feedback was collected through its field staff and about 20 per cent directly from the farmers. Letters and telephone calls contributed to 20 per cent in collecting the feedback. Excepting the Rubber Board, all other agencies did not care to collect feedback. Fifty per cent of the private nurseries never collected the feedback from the farmers. In the present scenario of competition only if the supporting services were strengthened the agencies could survive.

## 5.2 Farmers' preference to sources and planting materials of selected crops

### 5.2.1 Preference of farmers to sources

The various sources producing and supplying planting materials in the study area were the Department of Agriculture, KAU and Private nursery. When farmers were contacted for collecting the required information they considered Krishi Bhavan (KB) as a source supplying planting materials. But from an organizational point of view, KB is just a distribution outlet of the Agricultural department. But according to the farmers, there was significant difference between the quality of planting materials they purchased from KB and from the farms under the Department of Agriculture. Hence the farmers had taken KB as a source of planting material to register their preference.

Another observation was that majority of the farmers regarded fellow farmers (FF) as a reliable source. Hence from the farmers' point of view, in addition to KAU, ADF and PN, FF and KB were also considered as sources of planting materials. The farmers' preferences towards the sources assessed in terms of Rank Based Quotients (RBQ) were given in Table 22.

5.2.1.1 Coconut

Coconut farmers preferred to buy coconut seedlings from FF, which was explained by the highest RBQ. The results on the frequency of preference of coconut farmers towards sources also gave similar results (Table 10). About 95 per cent of the farmers had chosen fellow farmer as the most preferred source for coconut seedlings. A detailed analysis of the coconut farmers' preference to sources based on specific criteria also showed that FF got highest indices with respect to quality of seedlings, credibility of the source and local availability and second highest indices with respect to price and confirmed availability.

Government agencies like KAU and the ADF were given the second and third preference respectively by the coconut farmers. The frequency of coconut farmers' preference to sources showed that the KAU and ADF had been given second and third position by 48 per cent and 44 per cent of the farmers respectively. None of the coconut farmers had chosen KB and PN as their first preferred source of coconut seedlings.

The preferences of the farmers based on selected criteria like quality, credibility, price and local and confirmed availability were given in Table 12. The respondent farmers rated the quality of the coconut seedlings produced and supplied by fellow-farmers as the best. The quality of coconut seedlings produced and supplied by the KAU farms and the ADF were ranked second and third by the farmers. The quality of coconut seedlings supplied by the KB was considered worst even than that of private nurseries. Even though the coconut seedlings supplied by the KB were produced by the ADF, the ADF got an index of 71.6 whereas KB got only 52.47. The seedlings produced at the ADF were to be transported over long distance before they reached the respective KB. The seedlings being tender and young would be subjected to transportation shock that would tell upon their quality.

Credibility of the source was another important criterion that influenced the preference. Farmers trusted the fellow-farmers much more than any other agency as

evidenced by the high criterion index (94) compared to other agencies. The KAU was also enjoyed fairly high goodwill among the coconut farmers followed by ADF.

Being a perennial crop, the performance of coconut palm could be judged only after 7-8 years of planting. If inferior or low quality planting materials were used, the palms would prove to be uneconomic, causing considerable loss of resources to the farmer. Hence utmost care should be given to use quality planting material. Selection of mother palms with desired characters was the first and foremost step. Mother palms with the following characters should alone be selected for collection of seed nuts.

- Attained an age of 20 years
- Regular bearers with an annual yield of more than 80 nuts per palm per year and free of any disease
- Have medium sized nuts with average per nut-husked weight of 600 g and copra weight 150 g and above
- Have at least 30 fully opened leaves
- Have short petiole and short, stout and strong bunch stalk.

Seed nuts were collected during the months of January-April from root (wilt) free areas and sown in June. Harvested nuts were properly stored in shade and were then sown in raised beds. It is the one-year-old seedlings in the nursery beds that were the material ready for sale/distribution to farmers.

Jayalekshmi and Sree Rangasamy (2002) used discriminant function analysis based on morphological traits to rank coconut cultivars and hybrids that could help in selecting superior palms that could be used as mother palms for seed nut collection. But the practical application of this analysis in commercial production of coconut seedlings is yet to be proved.

Although it had been reported that the seedlings raised from nuts collected from the disease free palms growing in the disease affected districts showed better tolerance to the root wilt disease, it had not been found to be economically viable and

operationally feasible. Hence it had been specified that commercial production of coconut seedlings, nuts should be collected only from root wilt free areas, and those areas had been designated as regions north of Thrissur district. Since all the above procedures were involved and it takes at least two years before the seedlings become ready for sale, the credibility and expertise of the agency/organization paid its own dividend when it came to selection of preferred source.

In coconut, although WCT and hybrids – T x D and D x T are common, only WCT seedlings could be propagated by farmers and ordinary private nurserymen as production of hybrid seed nuts required special skill for conducting assisted pollination. Hence for the preferred variety, the coconut farmers had given highest criterion index to KAU, followed by ADF.

When other criteria like price, local availability and confirmed availability were considered, KAU and ADF secured lower positions. The local availability criteria were high for KB and FF. The criterion index of 'local availability' was the lowest for KAU (19.87), which indicated that there were no KAU farms nearby the study area. Timely and confirmed availability was least for KB although they were present in all the panchayats. This had been highlighted as one of the major drawbacks of our Krishi Bhavans even though they were comfortably placed with respect to affordable price.

A comparison of the selling price of the coconut seedlings charged by the various agencies presented in 4.1.5 supported the above observations. The selling price of WCT seedlings was higher for ADF than KAU; but for hybrid seedlings KAU had been charging much higher (Rs. 45) than ADF (Rs. 20). Although the ADF had fixed higher rates, as the seedlings were distributed through the KB, they would be linked with specific subsidy schemes. Hence the price for seedlings distributed through KB would always be lower, subsidy being 50-100 per cent depending upon the scheme.

From the above analysis, we could infer that with respect to the quality of coconut seedlings, goodwill of the source and local availability, the fellow farmers were reckoned as the first preference. This could be explained by the small size of the

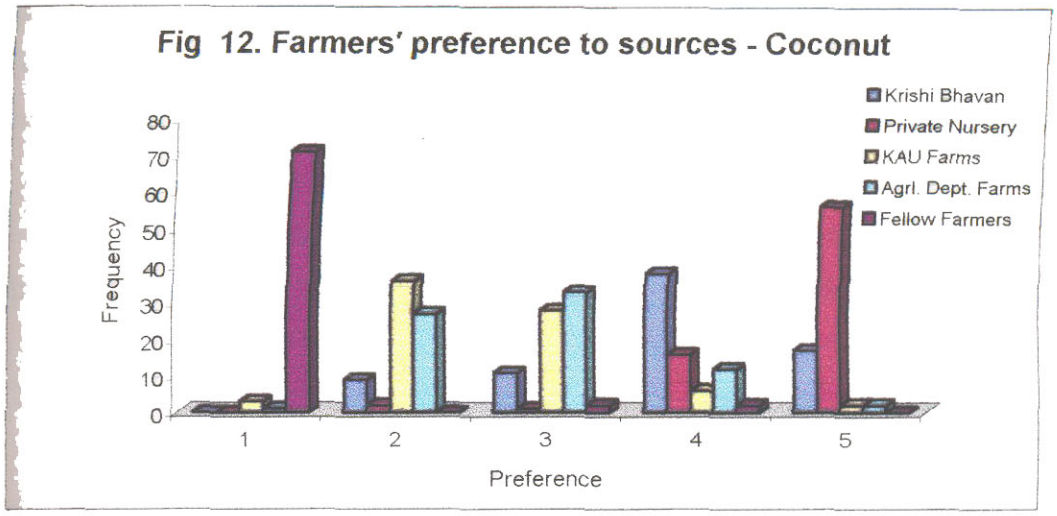


Fig 12. Farmers' preference to sources - Coconut
Krishi Bhavan
Private Nursery
KAU Farms
Agrl. Dept. Farms
Fellow Farmers
Frequency
80
70
60
50
40
30
20
10
0
1
2
3
4
5
Preference

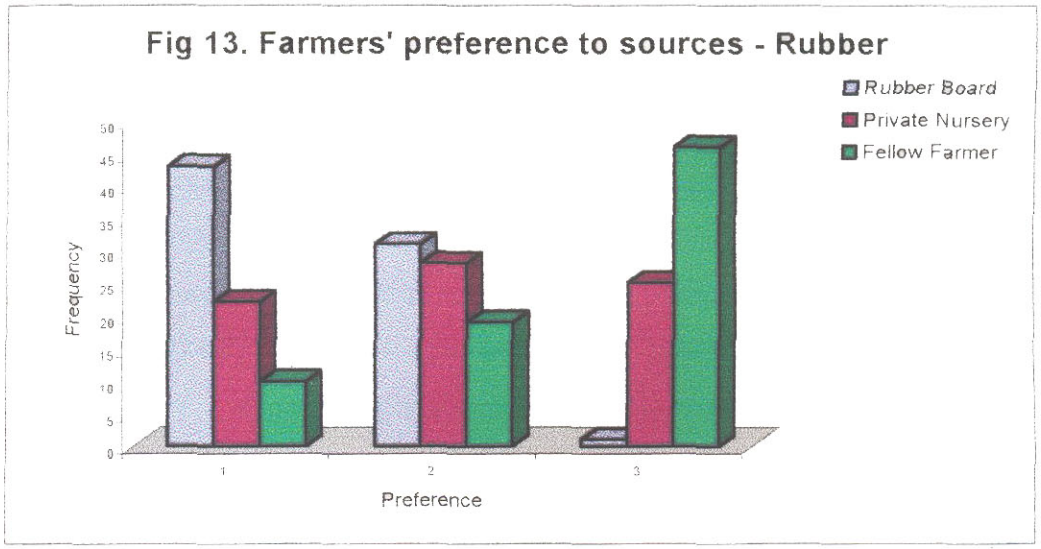


Fig 13. Farmers' preference to sources - Rubber
Rubber Board
Private Nursery
Fellow Farmer
Frequency
50
45
40
35
30
25
20
15
10
5
0
1
2
3
Preference

holdings of majority of the farmers, who at a time might be requiring only a few numbers of seedlings. So he might not be willing to spend more money on transportation cost and try his luck by purchasing from distant sources like KAU or ADF even though he could get the preferred variety. Experiences had proved that the farmers would not care for price and distance if they could get quality seedlings. But all these would occur only if the prospects of raising the crop were bright. In the present scenario of low prices for coconut and coconut oil, coupled with the trade policy of the Government, the farmers were not at all ready to invest money and energy on the crop.

5.2.1.2 Rubber

The need for planting materials of improved cultivars of the rubber plantations was met from the growers' own nurseries, nurseries run by the Rubber Board and private commercial nurseries. The general preference of the rubber farmers for these sources presented in Table 12 showed that the Rubber Board nursery was far ahead, followed by private nurseries and fellow farmers. All the aspects of rubber cultivation, crop improvement, processing and marketing were being taken care of by the Rubber Board through its well-knit network of field officers. About 57 per cent of the farmers considered Rubber Board as their first choice and 41per cent had ranked it second. The detailed analysis of the sources preference in terms of the selected criteria showed that with regard to quality, credibility and preferred variety the Rubber Board farms were the most preferred source. The criteria indices given in Table 13 showed that although the Board farm had been placed second with respect to price (44.3) and confirmed and timely availability (74.0). But they were comparable with fellow farmers who got indices of 48.1 and 78.2 respectively. Only with respect to local availability, the Rubber Board farms had been placed at an unfavourable position, which was explained by the distance of the central nursery, Karikkattoor from the study area.

The Rubber Board has created a very good rapport with the farmers and could gain the trust and goodwill of the farmers. There is a well-structured field establishment setup under the Rubber Production Department for rendering free advisory and extension services to rubber growers on all aspects of rubber cultivation.

The selling price pattern of planting materials of rubber was given in Table 5. The Rubber Board had fixed the selling price of Green budded stumps and Brown budded stumps at Rs. 5 and 6 respectively. The PN charged Rs.7 for Green budded stumps and Rs. 8 for Brown budded stumps. The poly bags planted with budded stumps has to be maintained in the nursery till they developed two to three whorls of leaves which required four to five months. Hence of late, the Rubber Board has not been producing poly bag plants, as the cost incurred in maintaining them in the nursery up to an additional six to eight month would be very high. PN had been selling poly bags at Rs. 18-20 per bag, as their establishment cost was low. The Rubber Board officials had said that although the production cost of the planting materials was higher as it included the establishment costs, they had been subsidizing the price in order to regulate the market price of the planting materials of rubber.

From the above analysis on the preference to sources producing and supplying planting materials of rubber, it could be seen that the farmers preferred RB most due to a host of reasons, the most important being the quality and credibility.

5.2.1.3 Cashew

The general preference to sources supplying cashew seedlings/grafts among the farmers of Kannur district showed that they preferred to buy grafts from KAU Farms (Table 14). Fellow-farmers were the next preferred source, especially for seedlings. Even though propagation through seedlings has been banned due to very low productivity of seedlings raised trees, still farmers went for seedlings. The farms under the State Department of Agriculture, especially the Central State Farm, Aralam had been hailed, for the good quality of cashew grafts produced.

The success of cashew cultivation depended on the selection of best varieties suited for the specific region (Salam et.al, 1999). Complete elimination of the use of seeds and seedlings for plantation development and use of clones of the recommended varieties of cashew alone was the salient determined effort towards the development of

cashew in the 8th plan (Balasubramanian, 1998a). The recommended planting materials for cashew were softwood grafts. Since cashew is a cross-pollinated crop, vegetative propagation is recommended to produce planting materials true to the mother. The success of softwood grafts depended on the rootstock and selection and preparation of the appropriate scion.

For preparing the scion, 3-4 months old non-flowering lateral roots of current season's growth from the required variety were selected. Pre-curing of the selected scions was done by clipping off ¾ portion of the leaf blades. Pre-cured scions were collected early in the morning to avoid desiccation. The wedge shaped end of the pre-cured scion was inserted into the cleft made on the decapitated stem of the rootstock and properly secured with polythene tape. The grafts would be ready for planting 5-6 months after grafting and could be kept up to one year.

Many researchers had reported that soft wood grafting was the cheapest and easiest method of vegetative propagation for commercial production of cashew grafts (Salam, 1999 and Lingaiah *et al.,* 2000). But for producing the graft of a particular variety, selection of the desired scion was the most crucial factor. To ensure that the softwood grafts of the preferred variety was obtained, one should be sure about the clonal material used as scion. It was at this point that the credibility and faith on the source supplying the cashew graft became relevant. As the use of seedlings as propagation material in cashew had been made illegal, the Government agencies produced only grafts, which are the most suitable propagation material for cashew. Though good yielder, these elite varieties were easily prone to diseases and pests and hence farmers still preferred seedlings. The recent reports on ill effects of insecticide sprays have aggravated the situation!

The results on cashew farmers' preference to sources based on criteria showed that for credibility of the source and preferred variety, the KAU farms had been given the first preference. For other criteria, i.e. quality, local availability and affordable price and timely confirmed availability, fellow farmers were preferred as the source for planting materials of cashew. This suggested that even now, the cashew farmers of

Kannur were planting degraded lands in farmer's plots with seedlings of non-descript and high yielding varieties. Cashew being a cross-pollinated crop, the seedling- raised trees never produced true to type progenies. The area expansion programmes under Waste Land Development Programmes though had established large plantations of cashew, used seedling progenies of non-descript origin and were grown under totally neglected condition. This had led to rapid decline in the yields after a period of time and by 1970, approximately an area of 2.81 lakh ha was covered with the progenies of seed origin of highly variable production potential (Rao, 1998).

The nearest KAU farm, which undertook production of cashew grafts, was the Regional Agricultural Research Station, Pilicode. The Cashew Research Stations under KAU are situated at Madakkathara in Thrissur district and Anakkayam in Malappuram District. The progeny orchard and softwood grafts of the elite cultivars released from these stations and suitable for cultivation in the northern zone (comprising of Kasargode, Kannur, Kozhikkode and Malappuram) of Kerala are available in these farms. The KAU farms have an added advantage as the farms that had originally developed the variety. Cashew grafts being easily susceptible to transportation stock, the survival rate would be low, if they had to be purchased from far away places. This might be the reason for majority of the farmers' response that the quality of grafts supplied by KAU was inferior to that supplied by fellow farmers.

The price for the cashew grafts was yet another factor that influenced the preference. A perusal of Table 6 showed that for cashew grafts there was no differential pricing depending on varieties and the KAU and ADF had been charging Rs. 20 per graft and private nurseries Rs. 18 per graft. Some progressive farmers who did grafting charged Rs. 15 per graft.

As far as confirmed and timely availability was considered FF got the maximum score. KAU and ADF had been ranked 3$^{rd}$ and 4$^{th}$ with respect to confirmed availability. As in all other cases, KB was the least preferred source for preferred variety and confirmed and timely availability. As far as KB was considered, it could

only distribute the grafts supplied from elsewhere. So untimeliness, damage and insufficient number were its inherent drawbacks.

In private nurseries, farmers usually had little faith, especially in the case of cashew, as the mother plants of the particular variety (progeny orchard) are a pre-requisite for producing grafts. Many a time experiences had taught the farmers not to purchase from private nurseries as they were investing on plants that are to serve them for their lifetime. The observations made by Balasubramanian (1998a) supported the above findings. Considering the short falls, during the Nineth Plan for cashew development emphasis was given on providing assistance for clonal plantation development and specific guidelines had been laid out to ensure the distribution of quality grafts.

5.2.1.4 Pepper

The various agencies that are engaged in the production and distribution of planting materials in Idukki district are the Cardamom Research Station under KAU, the Agricultural Department Farms such as DAF Arikuzha, SSF, Karimannoor and SVF, Vandiperiyar, private nurseries, Krishi Bhavans and fellow farmers. The frequency of preference given to sources by the pepper farmers (Table 16) proved that majority of the farmers (88%) in the study area preferred fellow - farmer as the best source for getting quality vine cuttings. All other agencies had been ranked much lower.

Detailed analysis of the preference of the source based on specific criteria was presented in Table 17. For all the selected criteria, FF far surpassed other agencies. The farmers of Idukki district had given criterion indices ranging from 67 to 88 to all the criteria selected for assessing the preference. The propagation of pepper was through rooted vine cuttings, which were easy to prepare. By selecting the mother vines of the preferred variety, enough number of propagating materials could be prepared with least effort. Hence the farmers themselves usually produced the vine cuttings required.

**Fig 14. Farmers' preference to sources - Cashew**

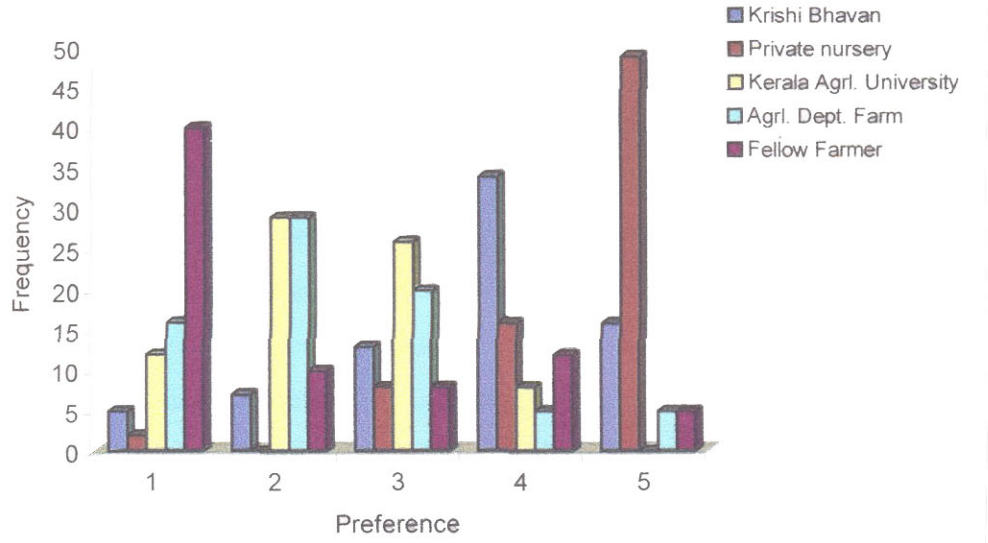
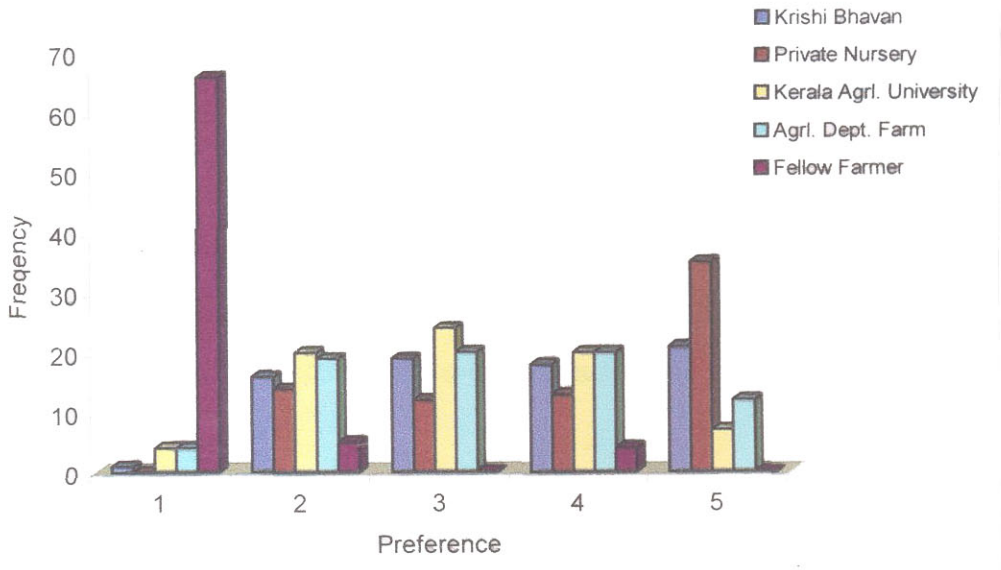



**Fig 15. Farmers' preference to sources - Pepper**



The fellow farmers got the highest index for credibility and trust of the farmers. The availability of the planting materials locally was another advantage with the fellow- farmer source. The KAU farm, CRS Pampadumpara situated in the district is located about 60 km from the study area. But the farm is not undertaking production of pepper cuttings over the last few years. The fall in demand for pepper cuttings consequent to the fall in price of pepper has been high lighted as the reason for stopping the production of pepper cuttings by the KAU. The Pepper Research Station, Panniyur is situated more than 300 km away in Kannur district. As the pepper crop is highly location specific and the performance of the variety depended on climatic conditions of the area, the farmers preferred to use vine cuttings available in their locality. The farmers said that all they needed from the KAU and other research institutions was the mother plant materials of new and high yielding varieties and appropriate technology. They requested that whenever new varieties of proven performance were released, arrangements might be made to supply them to farmers.

With respect to quality, credibility and preferred variety, KAU held a comfortable position among sources other than FF . But the distance of the KAU from the study area and price were the less favourable factors. The results were in concordance with the preference based on criterion index, where KAU was given the third position with respect to quality, credibility, preferred variety, affordable price and confirmed availability.

PN were the least preferred source for pepper cuttings. The preference based on criteria also showed similar results. Local availability and confirmed availability were the only favourable factors for the private nurseries.

Though the department of Agriculture had been distributing pepper cuttings through the KB as part of the Integrated Pepper Development Scheme, the farmers had given only fourth preference to KB, except for the criterion of price. With respect to price, KB had the second place to fellow farmers as most of the pepper cuttings distributed through KB was under some schemes with subsidized price.

The results of Path analysis carried out in respect of each source as dependent variable and criterion as explanatory variable for the selected crops indicated that the explanatory variables were not much effective in explaining the preference of the farmers. The coefficients do not express much influence on the farmers' choice of source. It might be due to the fact that the crops selected were not related ones and the agro- ecological requirements were also not the same. The measurements were in the nominal scale rather than in the ratio scale that might have also affected the analysis. However, the path having the lowest residual value in the case of each crop was selected to illustrate the direct and indirect effects of the explanatory variables on the source preference of the farmers for planting materials in a diagrammatic way. The coefficient matrices of direct and indirect effects of the criteria on the farmers' preference to FF as a source in the case of coconut, rubber, cashew and pepper were given in Tables 18 to 21.

In the case of coconut, moderate positive direct effects were noticed with respect to $x_1$ (quality) and $x_5$ (price). Moderate indirect effect was noticed with respect to the effect of $x_3$ (preferred variety) via $x_6$ (confirmed availability) and it is negative. The effects of other variables were found to be negligible (Fig. 16).

The path diagram for rubber (Fig.17) indicated high direct effect with respect to $x_1$ (quality) on the farmers' preference to FF as source of planting materials. The effects of other variables were found to be either low or negligible. The indirect effect of $x_1$ (quality) through $x_2$ (credibility), $x_5$ (price) and $x_6$ (confirmed availability) were found to be high, with positive coefficients. Similarly, the indirect effects of $x_2$ (credibility) and $x_3$ (preferred variety) were high and positive and that of $x_4$ (local availability) through $x_6$ (confirmed availability) was moderate, with positive coefficient.

With regard to cashew (Fig. 18), all the explanatory variables exercised low to moderate influence on the farmers' preference to FF as source of planting materials. All the coefficients of direct effect were negative except for $x_3$ (preferred variety). The indirect effect of $x_1$ (quality) and $x_2$ (credibility) through $x_3$ (preferred variety) was moderate, with positive coefficients. Similarly, the indirect effects of $x_1$ (quality)

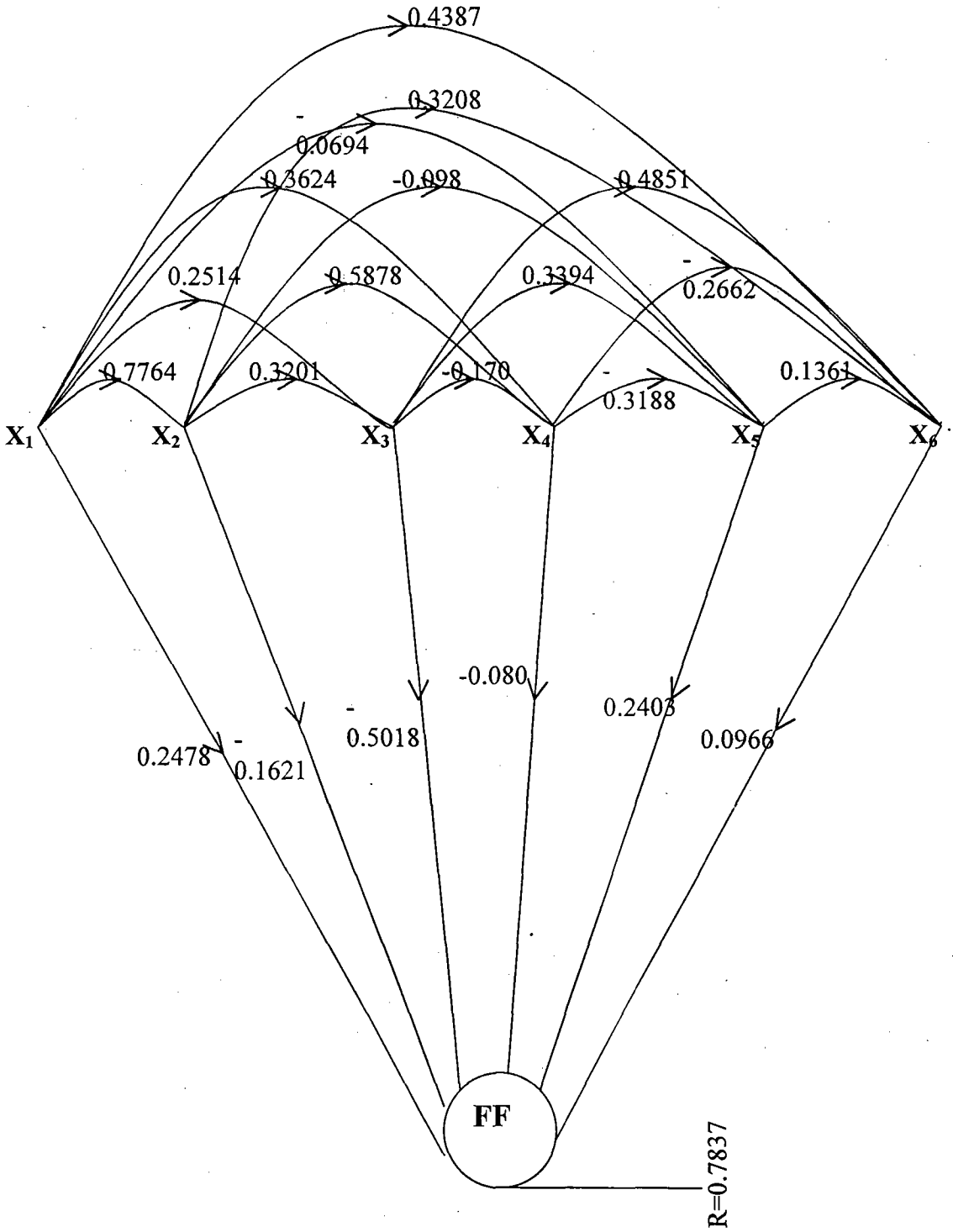



Fig. 16. Path diagram showing coconut farmers' preference to source (FF)

$X_1$ - Quality
$X_2$ - Credibility
$X_3$ - Variety
$X_4$ - Local availability
$X_5$ - Price
$X_6$ - Confirmed availability
FF - Fellow Farmer
R - Residual

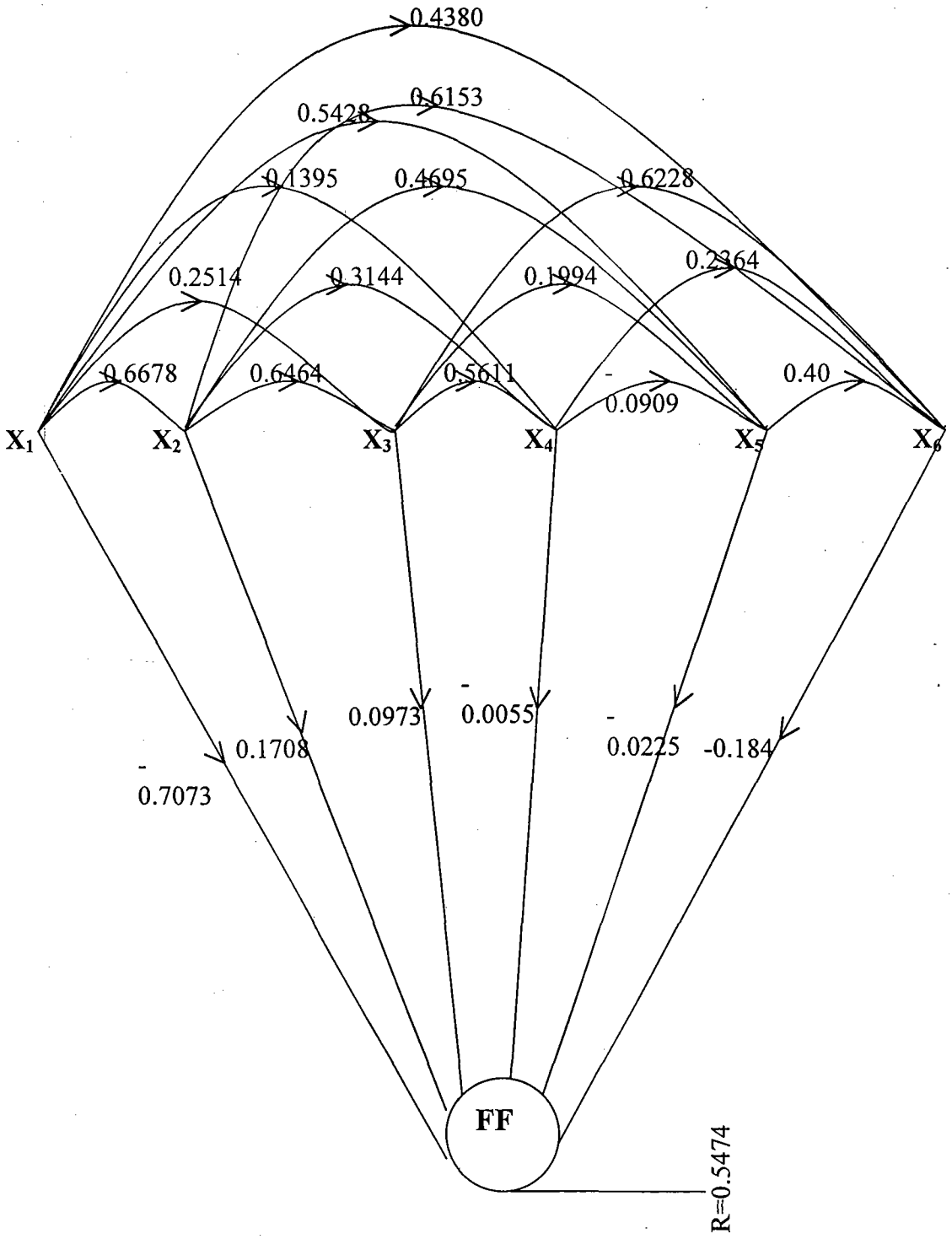



Fig. 17. Path diagram of rubber farmers' preference to source (FF)

$X_1$ - Quality
$X_2$ - Credibility
$X_3$ - Variety
$X_4$ - Local availability
$X_5$ - Price
$X_6$ - Confirmed availability
FF - Fellow Farmer
R - Residual

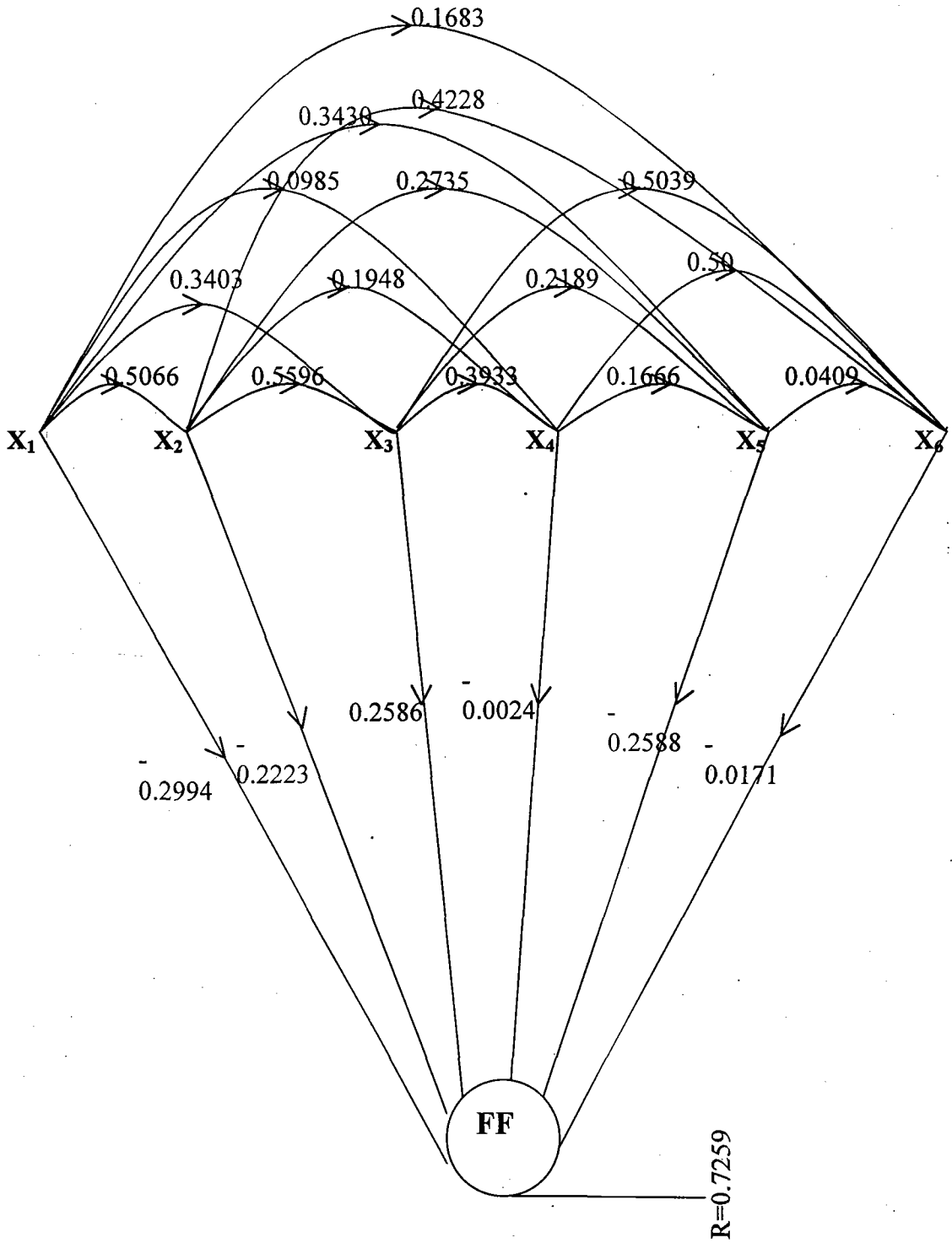



Fig. 18. Path diagram of cashew farmers' preference to source (FF)

$X_1$ - Quality
$X_2$ - Credibility
$X_3$ - Variety
$X_4$ - Local availability
$X_5$ - Price
$X_6$ - Confirmed availability
FF - Fellow Farmer
R - Residual

through $x_2$ (credibility) as well as $x_3$ (preferred variety) and $x_4$ (local availability) were moderate, with positive coefficients.

The path diagram for pepper (Fig.19) indicated high direct effect with respect to $x_1$ (quality), $x_2$ (credibility), $x_4$ (local availability) and $x_6$ (confirmed availability) on the farmers' preference to FF as source of planting material. $x_1$ and $x_2$ had negative coefficients and $x_2$ and $x_6$ had positive coefficients. The direct effects of other variables were negligible. The indirect effect of $x_1$ (quality) through $x_2$, $x_3$ and $x_4$ was high, with positive coefficients. The indirect effects of $x_2$ (credibility) through $x_3$ , $x_4$ and $x_5$ as well as $x_3$ (preferred variety) through $x_4$ and $x_6$ and $x_4$ (local availability) through $x_6$ were found to be high, with positive coefficients.

The crop and source - wise analysis of the path coefficients (Appendix V) indicated that the effect of the factors, quality, credibility, preferred variety, local availability, price and confirmed availability on the source preference of farmers' were was not substantial. In general, although it was found that in almost all the cases the path analysis was not effective as the residuals were very high, it gave the inference that quality of the planting materials supplied was the most important criterion that influenced farmers' preference for a particular source. Only in the case of rubber the path coefficient analysis of FF was found to be somewhat effective with a residual of 0.54.

The farmers' preference to sources analyzed using Rank Based Quotient is presented in Table 22.

Coconut and pepper farmers mostly preferred fellow farmers for getting quality planting material with RBQs 85.07 and 87.5 respectively. In the case of cashew, KAU was the preferred source with RBQ 66.2, followed by fellow farmers (RBQ-60.2). For rubber, the Rubber Board was the most preferred source followed by private nurseries with RBQs 72 and 65.3 respectively.

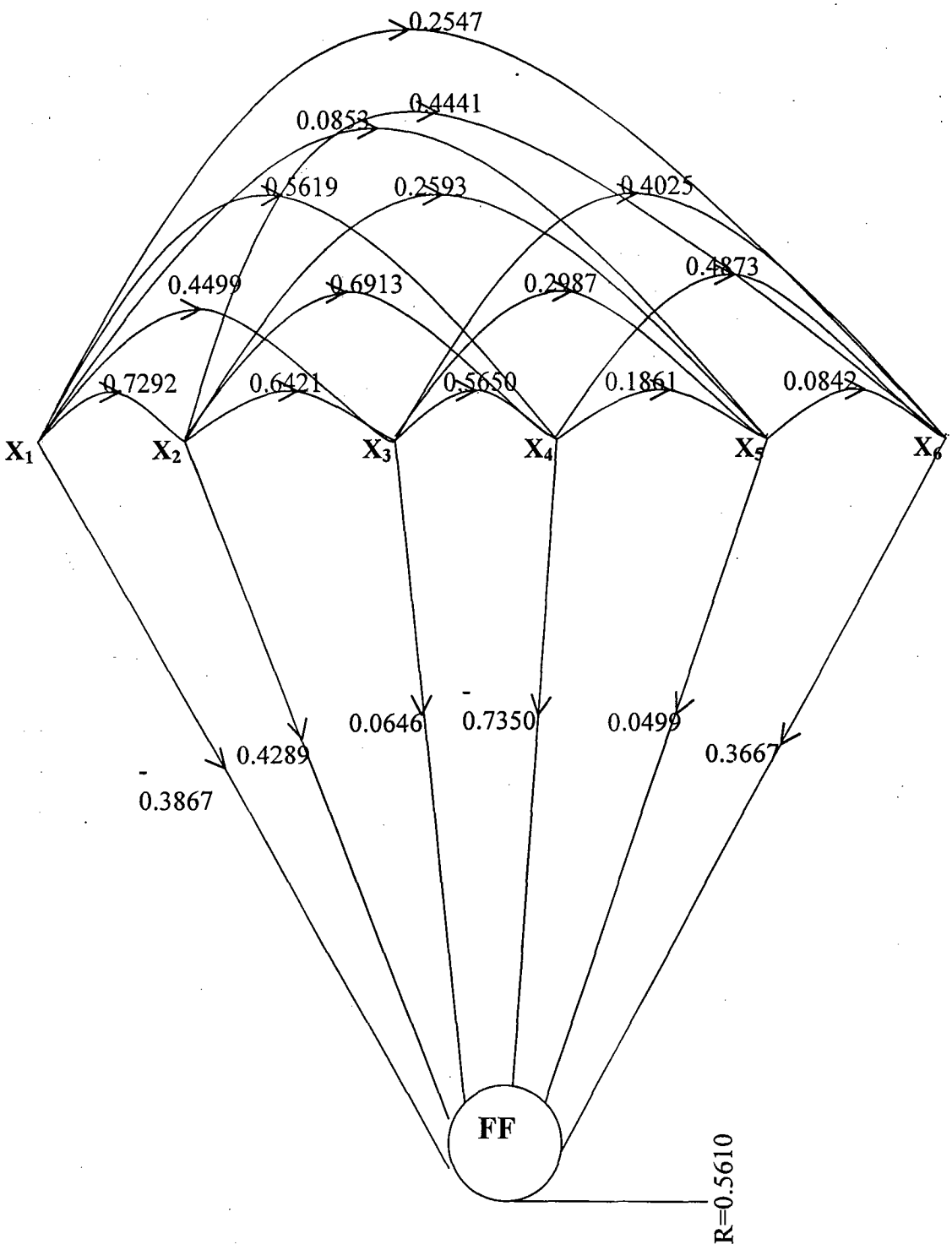



Fig. 19. Path diagram of pepper farmers' preference to source (FF)

$X_1$ - Quality
$X_2$ - Credibility
$X_3$ - Variety
$X_4$ - Local availability
$X_5$ - Price
$X_6$ - Confirmed availability
FF - Fellow Farmer
R - Residual

It was evident from the above analysis about the preference for sources that irrespective of the crop, quality, availability of preferred variety, credibility and reputation of the agency were the factors that influenced the farmers. If we could provide genuine materials at the right time farmers were ready to purchase even at a premium price.

### 5.2.2 Source of information

Only if the farmers could be informed about the availability of the planting materials at a particular source at the appropriate time, the materials produced at the production centres could be utilized effectively. Commonly used media were listed out and the respondents were asked to prioritise the media that contributed in giving the information on the availability of planting material at a particular source.

The results in Table 23 revealed that the source of information on availability of coconut seedlings from the KB was Extension Officers followed by friends and relatives. The information on coconut seedlings from the KAU was obtained mainly through radio followed by print media, whereas the farmers got information about planting material availability of coconut in the ADF through the Extension Officers in the department of Agriculture followed by the print media. The information on availability of coconut seedlings in private nurseries was mainly through the word-of-mouth from friends and relatives followed by print.

The source of information about planting materials of rubber from the Rubber Board was the field staff followed by seminars and exhibitions. From the PN the information was obtained through the print followed by friends and relatives. All the information on the cultivation of rubber from the Board was disseminated to the farmers through its wide network of field officers. The 'Rubber' magazine published monthly by the Rubber Board also carried the information on planting materials and management aspects of rubber. Out of the 75 respondents, 40 were subscribers of the Rubber magazine. As far as the FF were considered, the rubber farmers got the

information about the planting materials from friends and relatives followed by print media (Table 24).

The information source utilization pattern of Cashew farmers in Kannur district showed that from the KB the information was disseminated mainly through radio followed by friends and relatives. In the case of PN, source of information was print followed by exhibitions. Extension Officers and radio played insignificant role in giving information. Majority of the cashew farmers received information about planting materials from KAU through radio followed by print. Extension Officers followed by radio were the main source of information from the ADF. The information on cashew seedlings/grafts from fellow farmers reached the farmers through the friends and relatives followed by print (Table 25). Some farmers who produced planting materials of cashew advertised in the local newspapers about the availability of planting materials with them.

The information source utilization pattern of pepper farmers showed that the information on availability of rooted pepper cuttings in the KB was through the Extension Officers followed by radio. The All India Radio, in its regional broadcast has devoted half an hour daily in the evening for broadcasting news and classes on agriculture related issues (Table 26).

As far as PN was considered the information was disseminated through advertisements in newspaper and weeklies / magazines followed by informal talk with friends and relatives.

From the KAU, the information on availability of quality pepper cuttings reached the people through the programme *'Karshika Sarvakalasala Vartakal'* and other programmes on pepper cultivation broadcast by the All India Radio. The print media held the second position in disseminating the information from KAU. The KAU publication 'Kalpadhenu' is exclusively meant for agriculture related topics. Articles on particular crops and its cultivation practises as well as varieties/ cultivars available with their important characters appear in this quarterly. The 'Kalpadhenu' has about 5000

subscribers. The All India Radio, Thrissur has earmarked five minutes for '*Karshika Sarvakalasala Varthakal'* in the morning wherein the information and news from KAU was exclusively broadcast. The Communication Centre of KAU at the Directorate of Extension is in charge of the programme.

The information on availability of planting materials from ADF was obtained through the Extension Officers and the print. Fellow farmers used the print media for giving advertisement in dailies and leading magazines about the availability of planting materials, followed by friends and relatives.

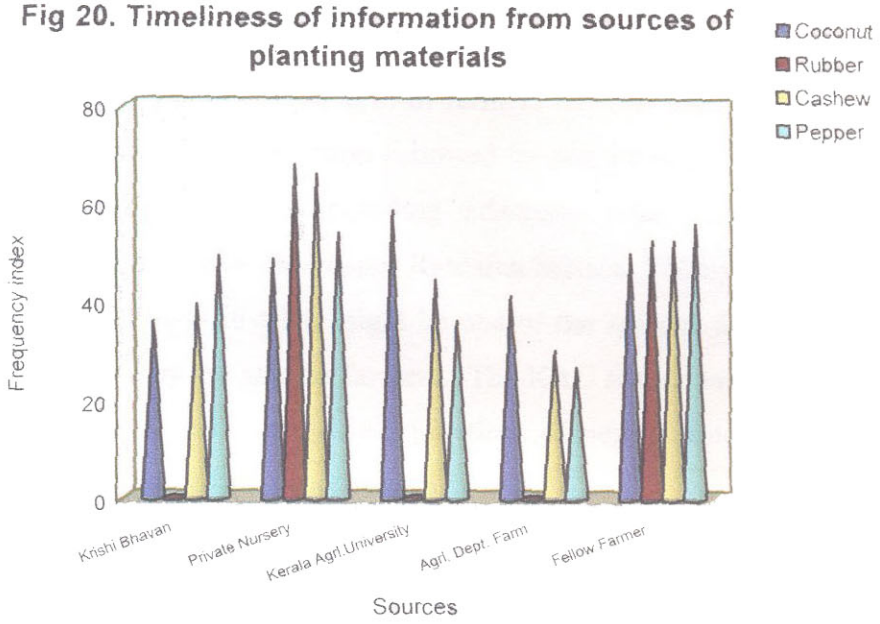
The results given in Table 6 revealed similar findings that radio and print media were the important promotional methods adopted by the for giving information about planting material to the farmers. The ADF used the radio and extension officials. The Rubber Board made use of its entire field staff to disseminate information about the availability of planting materials followed by the print.

For information to be useful, it should be timely and complete with respect to varieties/cultivars, their availability, peculiarities, cultivation practices and performance. The adequacy information from sources producing planting materials as perceived by the farmers presented in Table 27 indicted that in the case of coconut, the information received from all the sources, except fellow farmers was largely inadequate. Only 37 per cent of the coconut farmers opined that the information from KB was adequate and 32 per cent of farmers had reported adequacy of information from KAU.

In the case of rubber 86.7 per cent of the farmers said that the information from Rubber Board was adequate and served the purpose. The position of private nurseries and fellow farmers in giving adequate information in the case of rubber was much better when compared to other crops.

About 55 per cent of cashew farmers felt that the private nurseries were capable of giving adequate information followed by KAU (47%). Fellow farmers (44%) also provided adequate information about availability of planting materials to the

**Fig 20. Timeliness of information from sources of planting materials**



farmers. The cashew experts of the KAU through the print and electronic media disseminated the information about the availability of grafts, varieties and cultivation details to the farmers somewhat satisfactorily. The keen interest shown by the scientists of KAU in improving cashew cultivation and popularizing the new high yielding varieties was commendable.

The KB was capable of giving adequate information about planting materials in the case of pepper as evidenced by 59 per cent of farmers reporting adequacy in information obtained. About 55 per cent of farmers felt that their fellow farmers were capable of giving adequate information followed by private nursery (33%). The KAU and ADF were far behind in providing adequate information (19% and 12% respectively). The distance of the Pepper Research Station, Panniyur of KAU from the pepper predominant Idukki district, might be one of the reasons for the inadequacy of information registered by the sample farmers. The KAU should take necessary steps to popularize its varieties and management practices of pepper among the farmers and make them available to the farmers of Idukki district.

The results presented in Table 28 showed the frequency index of timeliness of information from the sources producing planting materials. In the opinion of coconut farmers, the KAU held the first position in giving timely information on availability of planting material followed by FF and PN. In the case of rubber, the Rubber Board was ranked first followed by private nursery and fellow farmers.

With regard to cashew, it was the PN who gave timely information about planting material followed by FF. Pepper farmers were of the opinion that they got timely information from the FF followed by PN.

Although the KAU was capable of giving timely information on availability of coconut seedlings, the information given was largely inadequate. In the case of cashew, although KAU was able to give adequate information, it was not reaching the farmers on time. The PNs were ranked first with respect to the timeliness of information, although the quality of materials supplied by them was low. The observations by Balasubramanian (1998b) that the extension services had not been effective in creating the required awareness about scientific technologies among the cashew farming

community and that even now a major sector of the farming community remained unaware of the technological developments also supported the results. Hence effective steps should be taken by the KAU to disseminate information about varieties and cultivars of crops and their peculiarities to the farmers.

As far as Rubber was considered, the efforts of Rubber Board were satisfactory and capable of disseminating all the required information about suitable rubber varieties.

For the pepper growers, the KB had been giving adequate information about varieties and cultivation, but they were not always able to give the information at the appropriate time. Jinraj (2000) had reported that as an agency for technology transfer 'Krishi bhavan' was found to be ineffective and that their functioning was largely confined to routine administrative works. Lack of time for extension work, untimely arrival of funds, frequent transfer of officials, poor quality of planting materials supplied to farmers and lack of proper data base required for preparing plans and schemes were found to be major constraints.

### 5.2.3 Farmers' preference to varieties

As a result of extensive researches conducted at the ICAR institutes, KAU and Rubber Research Institute, a number of varieties and cultivars of coconut, rubber, cashew and pepper have been released for cultivation. The awareness of farmers about these varieties/cultivars and their popularity among the farmers as well as the preference of farmers towards particular varieties of a crop are discussed in this section.

#### 5.2.3.1 Coconut

The cultivars/varieties of coconut popular among the farmers of Kerala were given in Table 29. West Coast Tall (WCT) and Lakshadweep Ordinary (LDO) are tall cultivars whereas Chowghat Orange Dwarf (COD), Chowghat Green Dwarf (CGD), and Komadan are dwarf cultivars suited to Kerala conditions. Tall varieties produce nuts with good kernal weight and quality of copra having fairly high oil content. Dwarf

varieties are mostly cultivated for tender nuts and ornamental value. T x D and D x T are intervarietal crosses of two morphological forms of coconut, which shows earliness in flowering, and give increased yield and better quality of copra and oil. Laksha Ganga, Ananda Ganga, Kera Ganga and Kera Sree are all T x D hybrids released for commercial cultivation in Kerala.

Although eight hybrids suited to Kerala had been released by the CPCRI, their popularity among the farmers was much low. The frequency index of awareness about the hybrids by their name ranged from 5.33 to 20.67 only. But the frequency index of awareness about T x D hybrid was as high as 80 and for D x T hybrid it was 58.67. This indicated that the hybrids were not popular among the farmers by their name. Almost all the farmers were fully familiar with the tall cultivar, WCT; which was the most common variety throughout the state. The awareness about T x D and D x T hybrids was better than the cultivars, COD, CGD and LDO. More than 60 per cent of the farmers responded that they were not at all aware of these varieties.

Almost all the farmers (91%) chose the local cultivar; WCT as the most preferred variety. The farmers had specific reasons for the preference. The longer life and somewhat stable yield of WCT palms had been highlighted as the reason for preference by about 37 per cent of the farmers. Another reason attributed was the low management cost when compared to improved varieties (22.67%). Fewer incidences of pest and disease occurrence in WCT palms was given as yet another reason for its preference by 17 per cent of the farmers. Non-availability of good quality seedlings of improved/hybrid varieties had been given as the reason for preference of the local cultivar by about 23 per cent of the farmers. The research and extension system seems to have failed in communicating the added advantages and special attributes of some of the improved varieties in terms of higher copra and oil content and earliness to bearing.

5.2.3.2 Rubber

The popular cultivars of rubber suited to Kerala conditions recommended by the Rubber Board are RRII 105, RRIM 600, PB 260 and GT 1. The awareness of

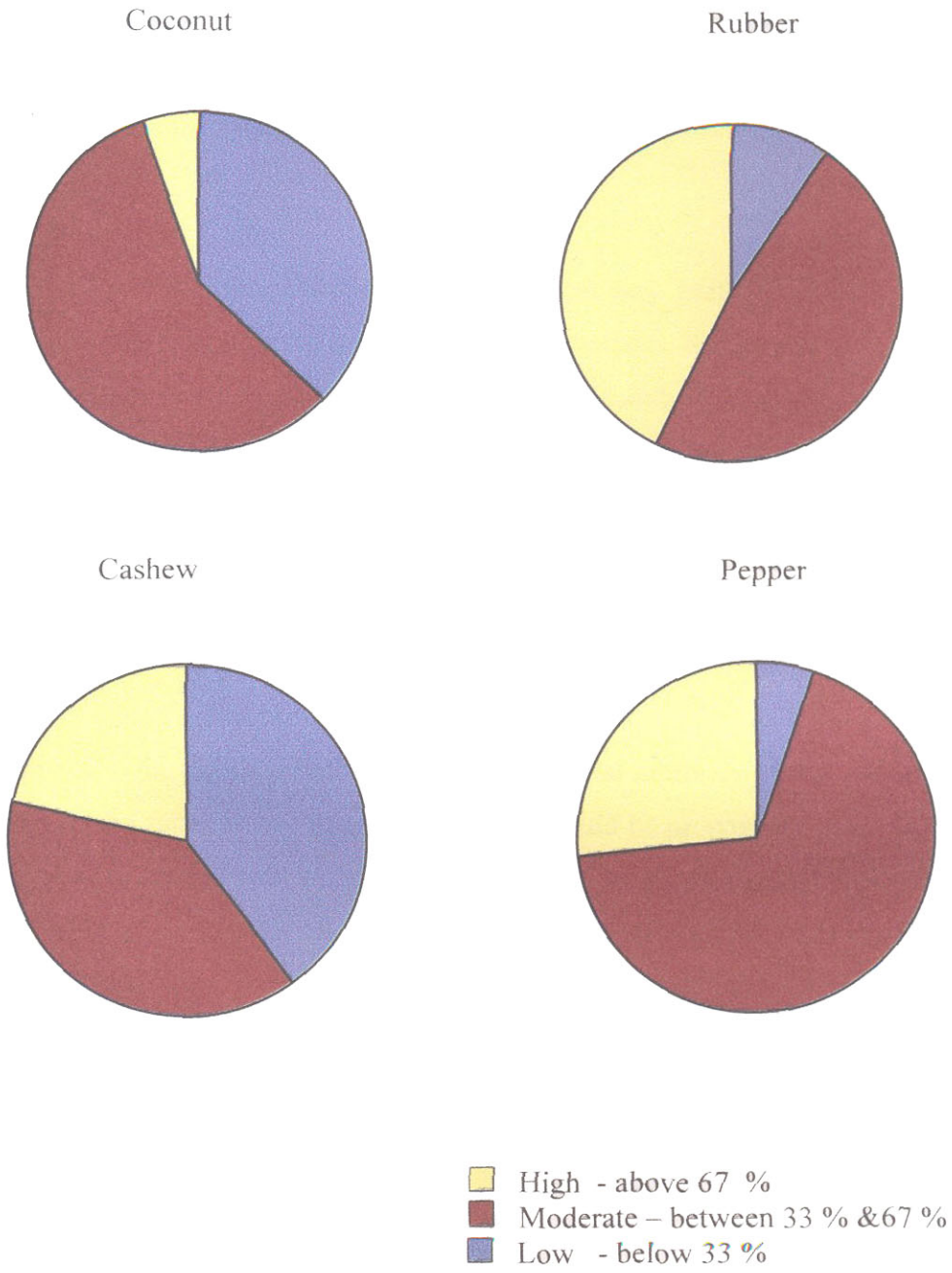
farmers about these varieties was given in Table 30. Almost all the farmers were well informed about the variety, RRII 105, which was the most popular clone among the rubber farmers. About 45.3 per cent of the farmers said that they were well aware about RRIM 600 and about 33 per cent were somewhat aware of RRIM 600. More than 40 per cent of the farmers were not aware of the variety PB260 and GT-1. The frequency indices of the awareness of the varieties showed that RRII 105, followed by RRIM 600, GT–1 and PB 260 were the popular varieties among the rubber farmers.

All the farmers preferred RRII 105 to other cultivars. RRII 105 released by the Rubber Research Institute of India is the ruling variety in Kerala. Its parents were Tjir 1 and GL 1. Farmer's preferred a particular variety in terms of its higher latex yield and Dry Rubber Content (DRC). The average yield of RRII 105 was 1970 kg/ha/yr, which was 35-40 per cent higher than the yield of other cultivars. It has fair degree of tolerance to abnormal leaf fall disease. The thickness of renewed bark was also good for RRII 105; followed by GT 1.Wind damage was another serious problem for rubber. RRII 105 was found to be free from wind damage if branch development was kept balanced; where as wind damage was high in RRIM 600, because of its fairly heavy branching and rather weak branch union. The only serious draw back of RRII 105 was the occurrence of tapping panel dryness, which could be seen in all improved cultivars. Hence adherence to tapping under half spiral, once in three days system has been recommended. Over and above, the adaptability of RRII 105 to our climatic conditions, made it the single most preferred variety among the rubber growers of Kerala even though it was prone to pink disease.

5.2.3.3 Cashew

KAU has identified and released more than 12 varieties suitable to Kerala state. The most important varieties being Anakkayam–1, Madakkathara 1 and 2, Kanaka, Dhana, Priyanka, Dharasree, Sulabha, Amrutha, Anaga and Akshaya. Although several high yielding varieties are available, the most popular ones among the cashew farmers of Kannur were selected after discussion with Agricultural Officers.

**Fig 21. Distribution of farmers based on awareness about varieties of selected crops**



The results given in Table 31 revealed that when all the farmers registered awareness about local varieties, they were not familiar with many of the new varieties. The frequency index of awareness for local varieties was 92 where as the indices for new varieties ranged from 16 to 56. The frequency index was highest for Madakkathara (56), followed by Priyanka (50). The yield potential of Madakkathara variety (13-17 kg/tree) and that of Priyanka (16.9 kg/tree) were very high compared to local varieties (5-7 kg).

Most of the farmers (56%) reported that they preferred new high yielding grafts, the rest (44%) preferred seedlings of local varieties. Some farmers preferred new varieties for their better performance in terms of yield and early bearing habit. But they were easily prone to pests and diseases. They demanded close care and intense management. The local cultivars though low yielders were sturdier. But they took long time to come to bearing. Rao (1998) remarked that the concept that cashew was introduced for soil conservation, afforestation and wasteland development had adversely affected its importance as a horticultural crop and were grown under totally neglected condition. The farmers still want to consider cashew as a low input and less management-requiring crop and hence preferred local cultivars (44%). Another reason attributed by the farmers was that local varieties could be propagated through seedlings, but for new varieties, soft wood grafts are the propagation material which farmers themselves could not produce normally. Further, the performance of these varieties was found to be region specific and the flowering habits were weather related.

Even though the Directorate of Cashew and Cocoa had been implementing schemes to establish regional nurseries for generation of adequate clones, the extent of increase in area was nominal. The low per capita availability of land (0.13 ha) in Kerala may be one of the reasons for this phenomenon.

5.2.3.4 Pepper

Panniyur varieties, Sreekara, Shubhakara, Karimunda, Kottanadan, Balankotta, Kuthiravali and Neelamundi were the high yielding varieties/cultivars of pepper suited to Kerala conditions. The popularity of these varieties and cultivars

among the farmers of Idukki was given in Table 32. Results revealed that Karimunda was the most popular variety among the farmers with a frequency index of 96.0, followed by Panniyur (90.67). Neelamundi was a variety common in Idukki district and the farmers preferred that variety for its disease tolerance and stable yield (58.0). The varieties from the Indian Institute of Spices Research like, Sreekara and Shubhakara were ranked IV$^{th}$ and VI$^{th}$ position in the awareness rating of the farmers.

Although majority of the farmers were well informed about Panniyur varieties and their yield potential, the farmers were reluctant to plant them as they succumbed to quick wilt disease very easily. About 53 per cent of the farmers recorded Karimunda as their most preferred variety. Only 19 per cent of the farmers preferred Panniyur varieties. The local cultivar, Neelamundi was the most preferred cultivar for 28 per cent of the farmers. Neelamundi has characteristics similar to Karimunda and is an early yielder too. The trend we could observe among the pepper growers was that instead of high yielding easily disease prone cultivars, a little low, but stable yielder showing tolerance to quick wilt disease was preferred. Some farmers also complained that they were not getting the new series of Panniyur varieties. Hence necessary steps may be taken to supply the new Panniyur varieties released by the KAU to the farmers.

A categorisation of the farmers based on their awareness about varieties and cultivars of the selected crops (Table 33) indicated that the coconut farmers had only "low" to "moderate" level of awareness about cultivars and hybrids of coconut. More than two-third of the rubber farmers fell in the category of "moderate " to "high" level of awareness about varieties. In the case of pepper, more than 90 per cent were in the "moderate" to "high" level of awareness about varieties. In the case of cashew farmers 79 % fell in the "moderate" to " high" level of awareness about pepper varieties.

The analysis about the farmers' awareness about the varieties and cultivars of the selected crop indicate that there is a wide gap in the adoption of technologies. The extension activities of the agencies may be strengthened in order to reach more farmers. Establishment of demonstration plots of new varieties adopting the entire recommended cultivation package and farmer participatory, location specific evaluation of the new

released varieties may be undertaken. Balasubramanian (1998b) had remarked that in order to ensure wider awareness, adoption of media support and literature development for dissemination of technologies as well as mass gathering approach through seminar, field days and conferences involving scientists, extension officers and farmers could be adopted.

### 5.2.4 Quality indicators for selection of seedlings

#### 5.2.4.1 Coconut

One-year-old seedlings raised in the nursery beds are the ready to sale/purchase planting materials of coconut. Satyabalan and Mathew (1976) had remarked that for evaluating coconut germ-plasm at the nursery stage, seedling characters such as the sprouting period of seed nuts, number of leaves, girth at collar and seedling height were generally used. The research system has developed some specific criteria for a good coconut seedling. The vigorous seedlings that are one year old, having minimum of six leaves and a girth of 10 cm at the collar should be selected for planting. Early splitting of leaves is another character preferred for selecting good seedlings (Wahid *et al.*, 1993). They are basically visual judgement criteria and the quality of the offspring depended, of course, on the characters of the mother palm and the seeds used for sowing. It is in this context that the trustworthiness and authenticity of the source producing planting material gains. importance. Coconut being perennial, the choice of the right seedling/planting material is of utmost priority lest the farmer will have to bear its ill effects throughout a lifetime.

The perceived importance of the indicators for the selection of quality seedlings by the farmers was presented in Table 34. Generally farmers had a liking to select seedlings that were tall and lanky. But such seedlings would be usually inferior in performance. The most scientific method for selecting good coconut seedling is the collar girth, which the farmers had ranked fourth only. The results suggest that the research system and extension system should make sincere efforts to educate the farmers 'how to select quality seedlings?'

5.2.4.2 Rubber

In rubber, seedlings stumps and budded stumps are the materials used for planting. A stump with a vigorous shoot and with a healthy initial whorl of leaves is the desirable material for planting (Rubber Board). The farmers usually selected the stumps based on the general vigour of the seedlings stumps, vigour of the bud eye, angle of the sprout (it should be about $45^0$) and the height of the first whorl of leaves. RBQ indices of the indicators of quality seedlings were presented in Table 35.

The farmers selected seedlings stumps from the nurseries based on their general vigour followed by the vigour of the bud eye. The height of first whorl of leaves was the next important criterion.

5.2.4.3 Cashew

Selection of planting material is the most important in cashew culture. Soft wood grafts are the best planting material. (Salam *et al.*, 1998) But the research system has not laid out specific criteria for selecting quality grafts for planting. Discussions with the experts in the field revealed that about six to seven months old grafts with unwhorled taproot and scion having pencil thickness were selected as quality graft from among the lot of grafts in a nursery. The RBQs of the quality indicators were given in Table 36. Farmers regarded the presence of a straight and uncurled taproot as the most important criterion. But this is not a visible attribute and hence farmers were sceptical about its practical utility. Among the visible attributes were age of graft (5-6 months old grafts) and thickness of scion. As far as the purity of the materials was considered, the farmers could only believe what the nurserymen claimed about the parent scion material. Hence the farmers considered that the most important indicator for selection of grafts was the vigour of the grafts and thickness of the scion.

5.2.4.4 Pepper

Pepper is propagated through vine cuttings. Rooted vine cuttings (5-6 numbers) planted in poly bags are the usual planting material available for sales. Farmers selected vigorous cutting, having broad dark green leaves with stout stem and

healthy roots. The research system has developed some criteria for selection of quality mother vines from which the cuttings were to be raised. But in a nursery, farmers were not able to see the mother plant and select the rooted pepper cuttings. After discussing with the researchers and the farmers some criteria had been arrived at for assessing the quality of vine cuttings (Table 37). The ranking of the quality indicators by the farmers revealed that vigorous nature of the cuttings, presence of healthy roots, dark green leaves and stout stem helped the farmers to select the vine cuttings to a certain extent. Although the farmers had responded to the criteria given, most of the farmers believed that it was the quality of the mother vine selected that decided the quality of cuttings rather than any other thing.

From the above analysis about quality indicators for selection of planting materials, we could infer that as such there are no quality standards fixed for the planting materials. The criteria, which the researchers use, are mostly non-practical, when it comes to commercial production. Also there is no assurance about the quality of the parent plants used for raising offspring. All the commercial crops studied being perennial crops; selection of the best parent material in terms of performance is of utmost importance. Balasubramanian (1998a) revealed that in the case of cashew, in order to ensure the quality of grafts distributed it was decided to procure grafts only from recognized nurseries and not to float tenders for procurement as it adversely affected the quality. It was also decided that procurement of grafts from any source should be made after physical verification of plants available in the nursery and authorities getting satisfied of its quality with regard to age, vigour and purity of materials. Necessary policy initiatives of the sort taken by the Directorate of Cashew nut and Cocoa Development should be there for ensuring some type of quality control in the planting material marketing system.

## 5. 4 Problems and constraints in marketing of planting materials

### 5.4.1 Problems and constraints faced by agencies

The major constraints faced by the various agencies engaged in the production and marketing of quality planting materials and their relative seriousness were presented in Table 38. Labour related problems had been ranked first by KAU, ADF

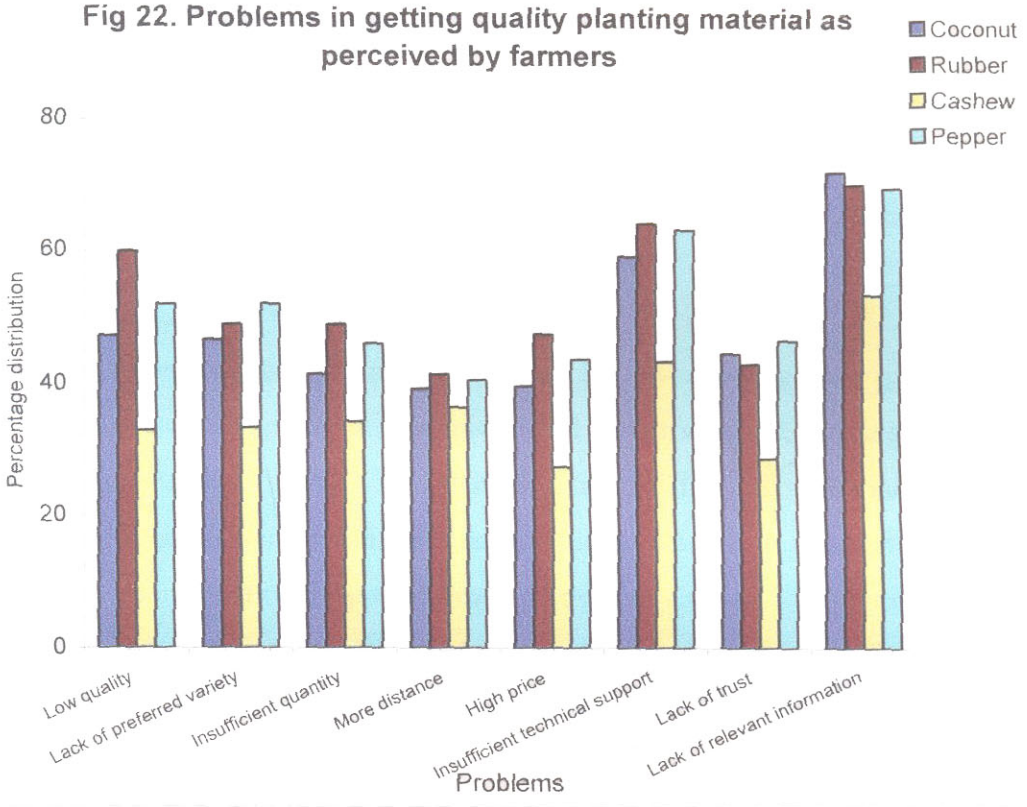
and Rubber Board. The labour related problems varied with agencies. As far as KAU was considered, inefficiency of labour and lack of sufficient skilled labour were the problems. Although there were enough technically qualified hands in KAU as a whole, in the farms in the study area there was dearth of qualified hands. For the ADF, inefficiency of available labour as well as lack of sufficient expertise was the problems. Labour was not at all a problem with the private nurseries.

Lack of sufficient infrastructure facilities for production like green houses, mist chamber etc was the next serious constraint reported by KAU farms. At the Pepper Research Station, Panniyur, non-availability of land to raise more Rapid multiplication plots of pepper to enhance the production of planting materials was the major infrastructure constraint. Insufficiency of funds was the third serious constraint faced by KAU farms.

Lack of facilities for irrigation, lack of green houses and mist chambers for undertaking production efficiently were the serious problems faced by ADF followed by inefficiency of labour and lack of skilled labour. Difficulty in getting good quality nucleus planting material, seeds, stock and scion materials for raising seedlings and grafts were other serious constraint of ADF.

According to the Rubber Board officials, the most serious constraint in planting material production was difficulty in getting quality nucleus planting material. The seeds meant for raising stock plants for bud grafting in rubber were procured from suitable plantations during seed fall season. The bulk of such requirement of the Board was met from plantations in Kanyakumari district of Tamilnadu where by virtue of favourable climatic conditions the seed quality and production were relatively good. The next serious problem was the lack of sufficient skilled labour. Other problems identified were not much serious as far the rubber Board was considered. But one serious problem the RB and the PN faced was the declining demand for the planting materials of rubber caused by the fall in price of natural rubber.

**Fig 22. Problems in getting quality planting material as perceived by farmers**



For the private nurseries, lack of infrastructure facilities for distribution, followed by difficulty in getting quality nucleus planting material was the constraint. Lack of sufficient funds and lack of infrastructure facilities like sufficient land, green houses and mist chamber that could improve the economies of scale of production were other constraints.

The main problem faced by the public sector agencies was the insufficiency of skilled labour for grafting and budding. Difficulty in getting good quality seeds, stock and scion materials for raising seedlings and grafts was yet another problem. Lack of infrastructure facilities for distribution and undertaking production were other major problems especially felt by the private nurseries. For the farms under the Department of Agriculture insufficient funds was also a major problem.

The agencies had given suggestions for overcoming the problems and constraints. In order to improve the technical skill of the workers, trainings have to be conducted from time to time. To ascertain the quality of materials produced, procurement of seed nuts and scion materials should be done from selected and certified gardens alone. Identification of proven seed gardens at farmers' fields could be done and decentralized production attempted. In order to ensure the distribution and movement of planting materials, linking with Government schemes could be attempted. Experiences had showed that research support was necessary in the technology dissemination and hence a greater role and co-operation of Agriculture Researchers in monitoring the demonstrations, imparting training and bringing out literatures for removing the ambiguity and misnomers in the technologies developed are required.

### 5.4.2 Problems faced by farmers in getting planting material

The problems and constraints experienced by the farmers in the availability of quality planting materials of the selected crops were presented in Table 39.

For all the crops, the most important constraint identified by the farmers was lack of sufficient information. In the case of coconut, 72 per cent and for cashew 70 per

cent of the farmers had complained that they were not getting all the required information about the varieties from the sources. Although Rubber Board through its vast network was working among the farmers, still the farmers (54%) felt that they were not getting adequate information about the planting materials. In the case of pepper 70 per cent of the farmers had opined that insufficiency of information from the source was the major constraint.

The second major problem faced by the farmers was insufficiency of technical support regarding the various aspects of the selected crops. The results in 5.4.1 supported this observation. Low quality of the planting material supplied was the third important problem in the case of coconut (47%). Pillai and Prasad (1983), Prasannan (1987), Ravichandran (1995), Reddy and Raju (1999), Thomas (2000) and Srinivasan (2001) also had reported that low quality of the seed/ planting material supplied was a major problem faced by farmers.

The major problems in getting planting materials as perceived by the coconut farmers from the sources in general were lack of sufficient information (72%) followed by insufficient technical support (59%), low quality of the seedlings supplied (47%) and lack of preferred variety (46%) respectively.

According to the rubber farmers, the major problems faced by the farmers in getting planting materials from the sources in general were low quality (60%), lack of sufficient information (54%) insufficient quantity (49%) and lack of preferred variety (49%) respectively.

In the case of cashew and pepper lack of sufficient information and insufficient technical support were the major problems perceived by the farmers in getting planting materials from the sources in general. The farmers were aware that in cashew and pepper a number of high yielding varieties had been released. But the availability of the planting material to the farmers was still questionable. According to the cashew farmers the other serious constraints were distance of the sources and

insufficient quantity. In the case of pepper, lack of preferred variety, low quality and lack of trust in the source were the other major problems perceived by the farmers.

An agency wise analysis of the important constraints as reported by the sample farmers of each crop was given in Table 40.

As far as KB was considered, insufficient quantity of seedlings was the major constraint with regard to coconut and cashew whereas lack of preferred variety was the most important constraint with regard to pepper. In the case of PN, lack of information about varieties was the major problem with respect to coconut and pepper as perceived by the farmers. In sufficient technical support was the major problem encountered from PN as perceived by the rubber and cashew farmers.

As far as KAU was considered, the cashew and pepper farmers reported that distance of the KAU farms from the selected crop predominant district and with respect to coconut, lack of information about varieties was the most important problem faced by the farmers in getting quality materials. As far as Rubber Board was concerned, distance of the source was the major constraint. The Central Nursery of the Rubber Board at Karikkattoor was about 40 km away from the study area. Insufficient technical support and lack of information about varieties were the most important constraint with respect to the selected crops in the case of ADF. Insufficiency of technical knowledge on the crop and its cultural aspects was the serious drawback in the opinion of farmers' as far as fellow – farmers as source were considered.

The above analysis pointed out that although several agencies like the Agricultural University and Central Research Institutes with strong wings for extension activities, the state Agricultural Department with field level offices at every panchayat and the field officers of the Rubber Board, Coconut Development Board and Spices Board were functioning at different levels for the improvement of agriculture in general and specific crops in particular, the farmers were still in the wild. The results point out at the need for having a rethinking about the efficacy of our extension programmes. Transfer of technology from research (Lab) to the farmers' field (land) is one of the major responsibilities of the extension wing of the Research and Developmental

institutes in the State. At many instances such transfer do not take place with perfection, with the result that there exists a wide gap between the 'adoptable technology' and the 'adopted technology'. The need for technology transfer derives its importance because of the importance of each crop and its role-played in general to the Indian agrarian economy, which is directly or in directly having its bearing on the industrial sector.

## 5.4 Suggestions to improve the efficiency of marketing of planting materials.

Seed / planting material is the most important input in agricultural as it contains in itself the blue print for agrarian prosperity. Non availability of good quality genuine planting material of the crops suited to specific micro agro climatic region had been highlighted as the most serious problem encountered in improving the production and productivity of crops. (John, 1993, Government of Kerala, 1997, Balasubramanian, 1998 b, Reddy and Raju, 1999 and Srinivasan, 2001). From the productionist/ marketers point of view labour related issues like non- availability of sufficient skilled labour, technical support, difficulty in getting quality stock/parent material and lack of infrastructure facility for distribution were the major constraints. The lack of quality control on the seeds and seedlings distributed has been a serious lacunae in the seed / planting material marketing. The lack of upper hand of the Government agencies, lack of quality standards and non-uniformity were other drawbacks.

The problems faced by the producer organizations in the production and distribution of planting materials and the problems encountered by the farness in obtaining quality planting materials from the organization were discussed in detail in 5.3.

On the basis of the study and suggestions received from the farmers, researchers, extension officers and nurserymen, the following suggestions are proposed to ensure proper availability of planting materials to the farmers.

- To over come the first and foremost hurdle in the production of quality planting material 'Difficulty in getting quality nucleus planting material', parent /clonal

mother gardens of the crops may be established at regional level by Commodity Boards/ Department of Agriculture.

- Good seed gardens at farmers' field to be identified and production to be carried out in a decentralized manner providing financial as well as technical assistance to farmer groups.

- Establishment of a 'Seed Certification Authority' at the State level with adequate enforcement powers through legislation, to ensure quality control in seed and planting material production and distribution.

- The institutions engaged in research and development of the selected crops should conduct regular and systematic demand forecasting.

- Infrastructure facilities like green houses, mist chambers and modern irrigation facilities in the farms and nurseries in the public sector may be strengthened to make the production more efficient

- In case of procurement, procure seedlings and grafts from recognized / approved nurseries alone. Procurement of seedlings and grafts from any source should be made after physical verification of plants available in the nursery and authorities getting satisfied of its quality with regard to age, vigour and purity of material.

- Demonstrations on newly released varieties of crops with all recommended package of practices may be conducted region wise by the KAU. To ensure wider awareness on quality planting materials and new varieties, aggressive extension programmes through print and audio- visual media may be adopted.

- Farmer participatory research may be encouraged which will lead to identification of suitable region specific varieties suited to varying agro-climatic situations.

- A directory on reliable sources for planting materials may be published by the Department of Agriculture/ KAU and updated periodically.

## 5.5 Appropriate models for marketing of planting materials

Marketing of seed /planting material is a unique feature of agricultural input marketing due to the fact that the 'product' here is easily perishable in nature. The producers dealing with planting materials may not be able to locate another profitable market and shift the supply to such markets or to convert the 'products' into value-added products.

The study revealed that the major problem experienced by the farmers was the lack of sufficient information on the availability of varieties from the sources. The farmers in general had registered low level of awareness about varieties and cultivars except in the case of rubber. The second major constraint in the opinion of farmers was insufficient technical advice. But a crop- wise analysis presented that in addition to the above, the low quality of coconut seedlings was another problem; whereas in the case of cashew and pepper it was lack of preferred variety.

From the producers' point of view, the major constraint was labour related issues i.e., 'inefficiency and unskilledness' followed by 'difficulty in getting good quality nucleus-planting material for raising seedlings and grafts. The problem of non-availability of nucleus planting material compounds the problem of inferior quality of planting materials supplied by the agencies. Lack of sufficient infrastructure facilities for production and distribution were other problems. Apart from the constraints listed above, the Government agencies at present are facing paucity of funds. To overcome this difficulty, thorough restructuring of the existing strategies, if any, of the organizations is required.

In the present system of commercial production of planting materials, which is undertaken mostly by private nurseries, there is no mechanism for quality control. The nucleus/parent material of the varieties/cultivars released will be available with the breeders in KAU/ Research stations of ICAR who evolved the varieties. As part of their research activity, the Scientists evolve new varieties and cultivars, and after testing the adaptability and adoptability of these new varieties, they are recommended for release.

Once the State Variety Release Committee formally releases the varieties, they could be commercially produced and sold. The ADF and private nurseries undertaking commercial production of planting materials of the new varieties/cultivars have to get the parent/nucleus material from the Research station concerned, before undertaking commercial production. The crops studied being perennial, it takes minimum six to seven years to assess their performance and hence the commercial production of planting materials of the selected crops is a long drawn process.

The Governmental agencies being able to meet only less than 20 per cent of the planting material requirement of the crops, the farmers depend heavily on private nurseries and fellow farmers. The farmers were compelled to rely on the credibility of the source, with regard to quality of the material supplied. The farmers have no other choice but to believe what the private nurserymen claimed, about the variety as well as its parentage. The quality - indicators for selection of seedlings discussed in para 5.2. 4.1 were mostly impractical and unrealistic.

In the present IPR regime, the rights of the plant breeder have to be protected and as such the implications of IPR on our agriculture research has not yet been studied. The WTO and GATT agreements warrant quality in all aspects that could be reflected in the quality of planting materials also. Only if the preferred varieties with preferred characters and attributes like uniform size, quality and colour were evolved as part of the breeding programme, the farmers would accept them.

Many committees and studies had stressed the need for a good marketing and delivery system for seeds and planting materials. Venkateswarlu (1985) while discussing on the strategies for increased farm production in India had suggested that taking up self-contained programmes at lower levels itself for seed production and multiplication would reduce difficulties in distribution. Ramamurthy (1989) while discussing the report on the Expert Group on Seed opined that there should be arrangements for regular forecasting of seed demand and the 'single – window' approach may be followed for sale of all agro-inputs together. They envisaged an integration of the public, co-operative and private sectors.

Brain storming sessions conducted with the farmers, extension officers and scientists during the survey in order to bring out an outline of appropriate marketing models suggested that planting material production may be undertaken scientifically at regional level. The local level planning process implemented in Kerala will be of very much relevance to small and marginal farmers. Many of the organizational lacunae could be solved through 'group approach' at the initiative of the local bodies at the three-tier level of organizational set up under the planning process – the grama panchayat, block and district panchayats. In order to overcome the major constraints pointed out by farmers 'the lack of sufficient information' on availability of planting materials, publishing a directory containing the details about the names of recognized agencies, price and type of planting materials available may be thought of. The responsibility of publishing the directory may be borne either by the KAU or the Department of Agriculture /Commodity Boards.

A Seed Certifying Agency may be set up with the responsibility of quality control and certification of agencies undertaking production and marketing of planting materials. The organization of the authority could be preferably as an independent entity having adequate representation from KAU, Department of Agriculture and Commodity Boards. Certificates should be given to the private nurseries by the authorities entitling them to undertake production, multiplication and distribution of planting materials.

Since the commercial production of planting materials of the crops is a multifaceted issue involving crops that are unique in their growth, bearing habit and propagation techniques, specific models have to be developed for each of them.

Taking into consideration all the above, marketing models for the selected crops have been proposed.

### 5.5.1 Coconut

The KAU and CPCRI are the two organizations engaged in crop improvement in coconut. Almost all the new varieties/cultivars and hybrids of coconut have been

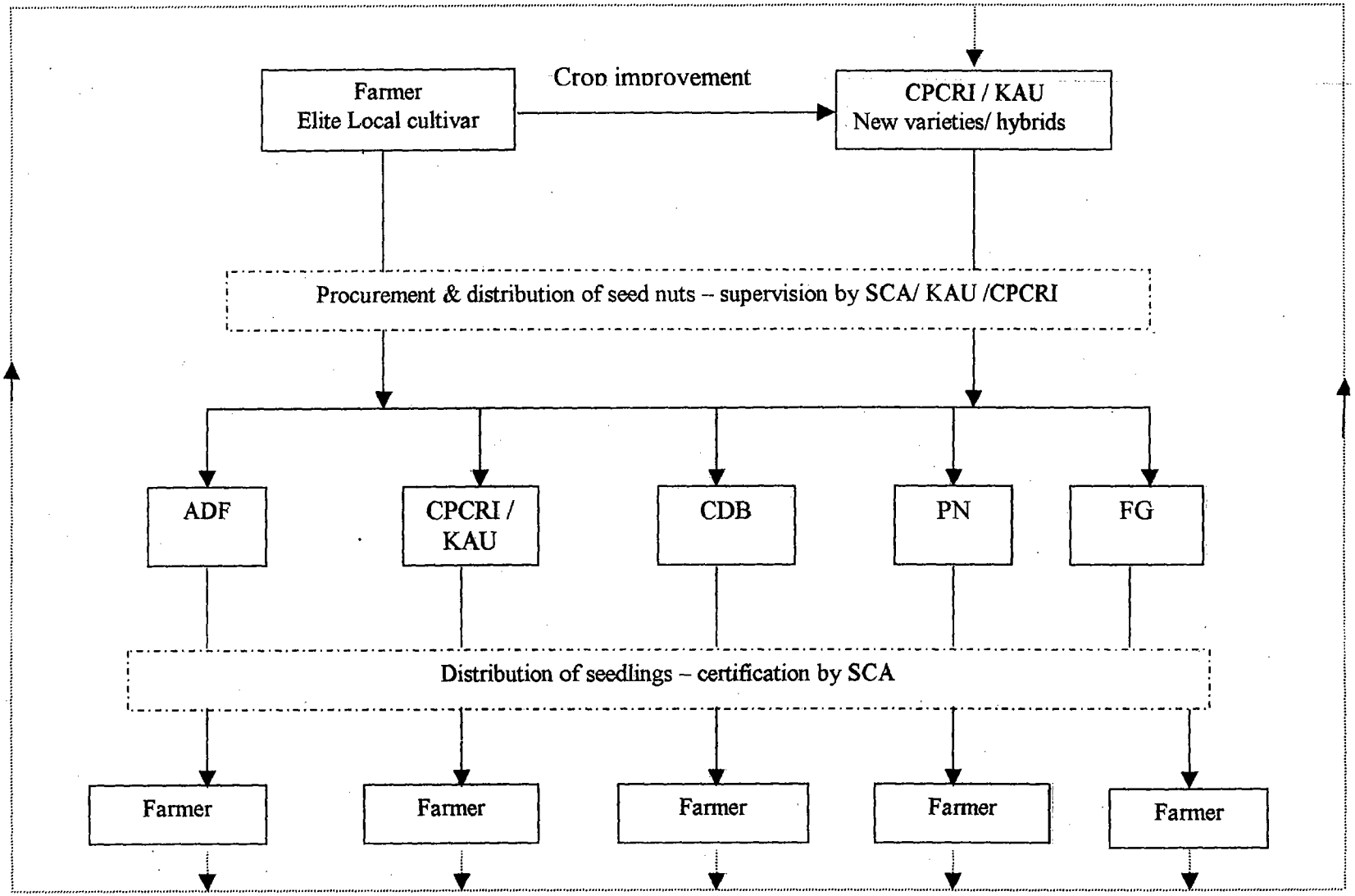
released by CPCRI. The agencies involved in the commercial production of coconut seedlings apart from the above mentioned ones are the ADF, CDB and the private nurseries. The seedlings raised from quality nuts are the most popular planting material for coconut. (See 3.8.1) The mother seed nuts for producing WCT coconut seedlings have to be procured from root wilt disease free areas north of Thrissur district. Hence the availability of disease free nuts was the pre-requisite for producing quality seedlings. The Research system has laid down specific guidelines for the selection of mother palms for seed nut collection as well as for selection of seed nuts. The mechanism for seed nut procurement followed by the State Department of Agriculture for raising coconut seedlings in ADF has been discussed in 5.1.2. But such a well-defined systematic procedure is lacking in the other agencies especially, the private nurseries. There is no provision for supervision and quality control by the State Department of Agriculture or the Coconut Development Board or the KAU or CPCRI over the seed nuts used by private agencies. Hence supervision and quality control measures at various stages of seedling production and distribution have to be ensured by the institutions concerned.

For coconut the following model is proposed (Fig 23.).

1. The existing coconut seed nut procurement practice of the State Department of Agriculture may be extended to KAU, CDB and PN. The mother palms for nut collection should conform to the specifications laid down and should be under the supervision of a competent official from KAU / ICAR / the Department of Agriculture. Seed nuts of hybrids should be collected only from the farms that undertake hybrid nut production through assisted pollination. Registered private nurseries alone should be given permission to procure seed nuts and it should be supervised by a competent authority.

2. The seed nuts collected should be transported carefully to the seed farms and private nurseries where the seedlings are to be raised. The sowing may be done under the supervision of qualified and experienced persons in the Department/KAU.

**Fig 23 Proposed model for marketing of planting material – Coconut**




ADF - Agrl. Dept. Farm
KAU – Kerala Agrl. University
CDB – Coconut Development Board
CPCRI - Central Plantation Crops Research Institute
PN – Private Nursery FG – Farmer Group
SCA – Seed Certifying Agency

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3. The seedlings raised may be subjected to culling at two stages before giving for sales and may be certified by the Seed Certifying Agency before release for sale.

4. In order to ensure the availability of quality planting materials produced by KAU, CPCRI and ADF at the premises of the farmers, local fairs/ exhibitions may be organized by Agri- Horticultural societies/Karshaka samithis/ Primary Agricultural Credit Societies or procured by these agencies and made available at regional level at affordable price.

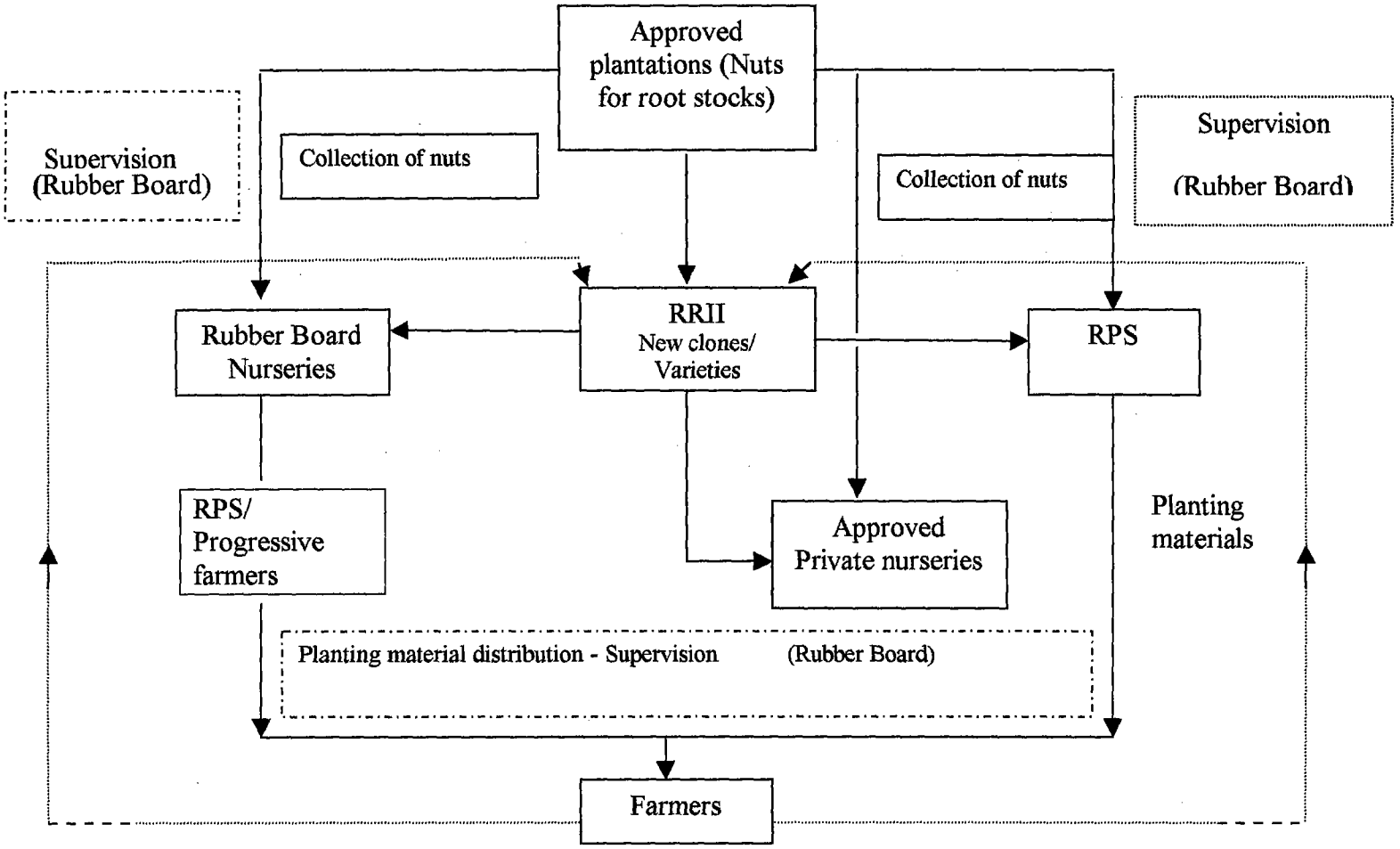
As it is difficult to certify each and every lot, only registered private nurseries may be given permission to undertake commercial production of planting material. The designated officers from the "Seed Certifying Agency" should make periodic visits and ensure the quality of the materials produced before sales.

### 5.5.2 Rubber

The Rubber Board is carrying out the research on crop improvement, crop production and marketing in the case of Rubber. Apart from the Rubber Board only the private nurseries are engaged in the commercial production of planting materials of rubber. The research on crop improvement and management of rubber is conducted at the Rubber Research Institute of India situated at Kottayam, which is under the administrative control of the Rubber Board. As only a single agency is dealing with all the aspects of the crop, the functioning of the overall system with regard to rubber is found to be satisfactory.

The farmers ranked the Rubber Board nurseries as their first choice of source followed by private nurseries. The farmers did not have any complaint about the quality of the grafts and polybags distributed through the Board and their only concern was with the distance of the Central Nursery, Karikattur from the study area. The most serious problem faced by the farmers with regard to planting materials of rubber from private nurseries was insufficient technical advice. In the case of rubber the major constraint in planting material production was the difficulty in getting nucleus seed

## Fig 24. Proposed model for marketing of planting material- Rubber




RRII Rubber Research Institute of India
RPS Rubber Producers Society

→ Marketing channel
⇢ Feed back

material as opined by the Board officials as well as the private nurserymen. The seeds for raising rootstock were procured by the Board from the plantations in Kanyakumari district where the quality of seed is the best. But the private nurseries usually collected the fallen seeds from the nearby plantations and raised the rootstock. Hence suitable measures need to be undertaken to ensure that the seeds are collected/procured from identified mother gardens. Those nurseries, which raise the rootstock using seeds from specified gardens, need alone be given the license to undertake commercial production of planting materials. The Rubber Producers' Society (RPS) would be of immense help in this regard. The procurement of seed nuts as well as production and distribution of planting materials could be under taken by the RPS under the supervision of the Rubber Board.

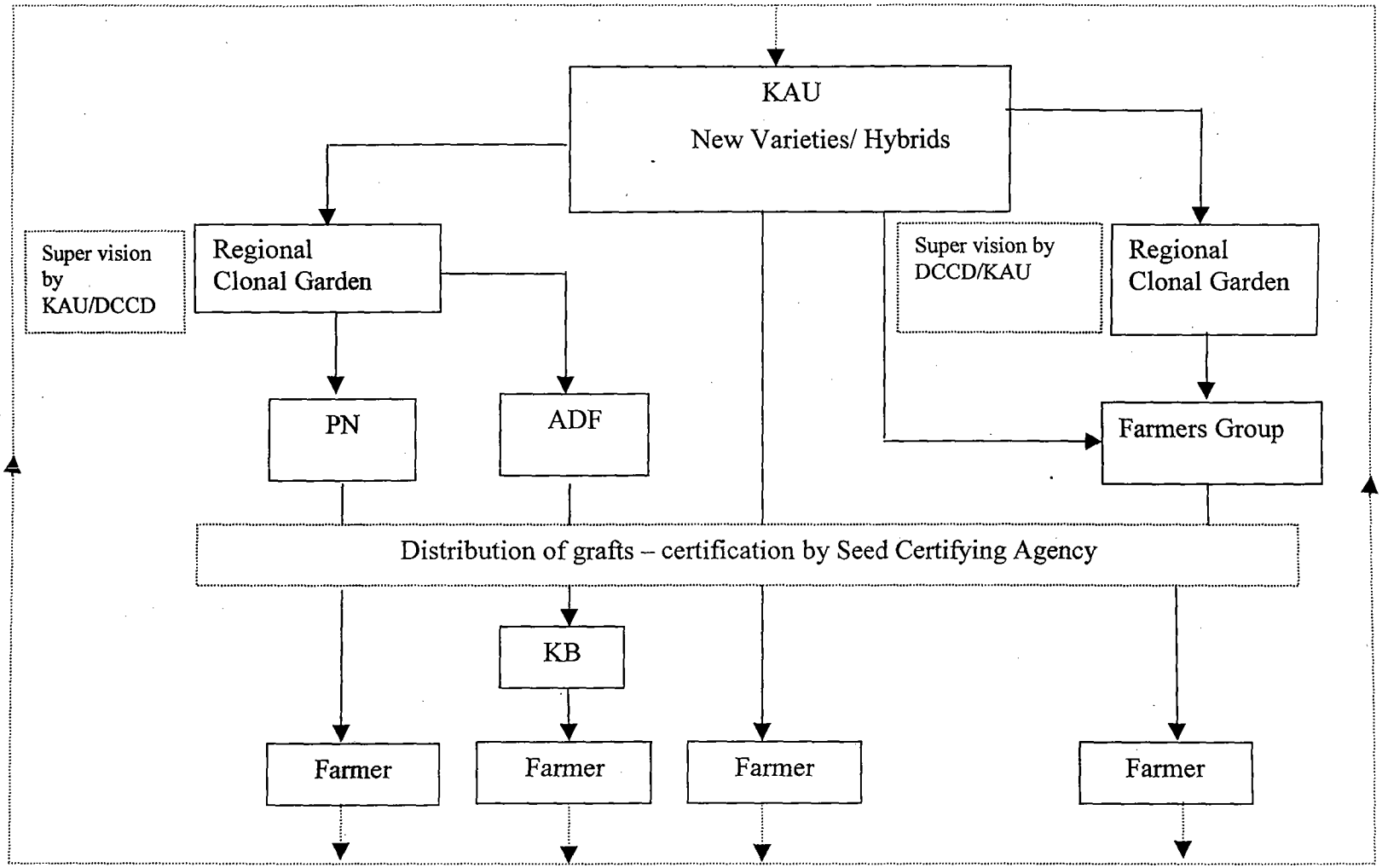
The technology transfer mechanism of the Rubber Board is the most efficient one among the bodies of the similar type existing in the country. The performance of the new varieties and cultivars planted could be assessed during the regular field visits of the field officers.

As far as rubber is considered not much deviation from the existing system is needed. Providing quality certification to the private nurseries dealing with planting materials and introduction of RPS as production and distribution centers of planting materials are the modifications proposed in the present system (Fig 24.)

### 5.5.3 Cashew

In Kerala, KAU is the only organization dealing with crop improvement in Cashew. All the hybrids and varieties suited to the State have been released by the Cashew Research Stations situated at Anakkayam and Madakkathara. The agencies undertaking commercial production of cashew grafts apart from KAU, are the ADF and Private nurseries. But these two have to depend on KAU for the nucleus material for producing new varieties/hybrids. The Directorate of Cashew and Cocoa is not involved directly in crop improvement. With the objective of complete elimination of the use of seeds and seedlings for plantation development and use of cashew grafts of the

**Fig 25. Proposed model for marketing of planting material - Cashew**




KAU Kerala Agricultural University
ADF Agriculture Department Farm
PN Private Nursery
DCCD Directorate of Cocoa and Cashew Development

Channel

Feedback

recommended varieties, the Directorate of Cashew and Cocoa established regional nurseries to generate clonal planting materials.

The Directorate had included in the 9th plan programme, the 'Establishment of Regional nursery' component in order to ensure the availability of elite planting materials to farmers.

The study revealed that the most serious problem in getting grafts of cashew as perceived by the farmers were "lack of relevant information", 'insufficient technical advice' and 'distance of the source supplying quality grafts'. Balasubramanian (1998) observed that despite the availability of improved technologies, their rate of adoption in the field was very low and majority of developed technologies were either under adopted or wrongly adopted. He had further remarked that the extension lacunae had been more responsible for the bad state of affairs. But the organizations faced another set of problems of which 'difficulty in getting good quality parent/nucleus material' was the most serious one followed by 'inefficiency and unskilledness of the labour'.

Since the availability of grafts of new cashew varieties released was very much limited from KAU, the farmers had to depend more on ADF and private nurseries. But they in turn had to depend on KAU for the nucleus scion material, which was the major constraint experienced by these organizations. Availability of good quality specified scion material is the major challenge in commercial cashew graft preparation. The transportation shock caused to the grafts is yet another drawback which reduced the percentage of establishment.

Taking into consideration all the above facts, a practical and viable solution proposed for production and distribution of quality cashew grafts of the variety of farmers' choice would be to organize production at local level. The following model has been proposed for cashew (Fig 25).

1. Regional nurseries may be maintained at taluk level under the supervision of KAU/ Directorate.

2. Establishment of regional clonal gardens - Select progressive and enterprising farmers with minimum one hectare of cashew plantation and a part of his plantation may be maintained as a scion bank with 5-6 elite varieties of cashew.

3. Training should be given to progressive farmers, unemployed youth and nurserymen on grafting and budding techniques under the auspices of KAU.

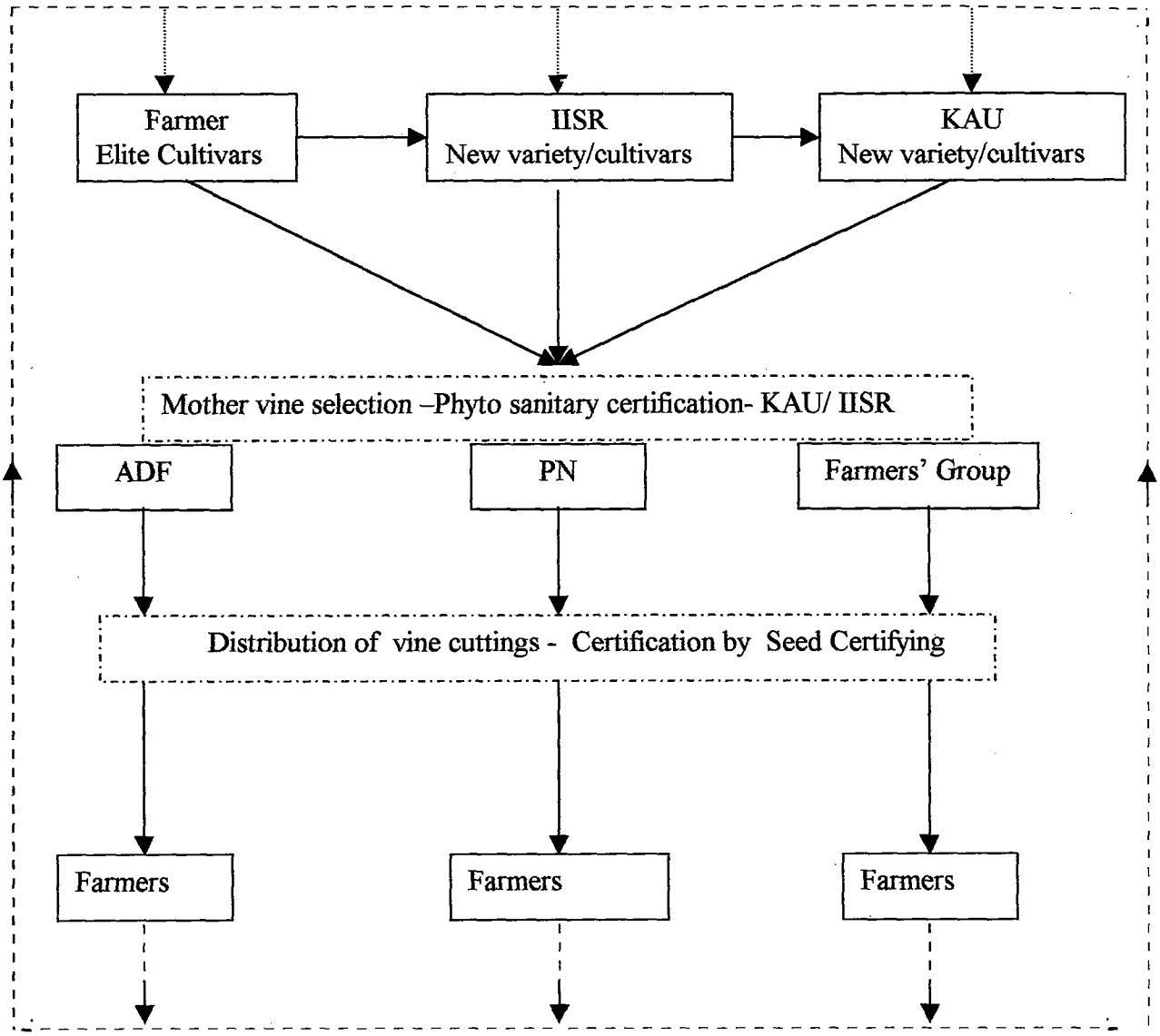
4. In order to ensure the availability of quality planting materials produced by KAU and ADF at the premises of the farmers, local fairs/ exhibitions could be organized by Agri- Horticultural societies/Karshaka Samithis/ Primary Agricultural Credit Societies or procured by these agencies and made available at regional level at affordable price.

The role of the Directorate in this model would be to aid the establishment of regional nurseries and model clonal gardens at the block or regional level, and supervise the procurement and distribution of grafts. Quality certificates may be provided to private nurseries and progressive farmers only after physical verification of plants available in the nurseries and authorities getting satisfied of its quality with regard to age, vigour and purity of materials by the 'Seed Certifying Agency'. The ADF also may be brought under the purview of quality certification. A greater role and cooperation of the KAU researchers are envisaged in monitoring the demonstrations, imparting training and in bringing out literature to remove the ambiguity and misconception in their technologies.

### 5.5.4 Pepper

The organizations dealing with crop improvement in pepper are PRS, Panniyur under KAU and IISR, Kozhikode. They have released the high yielding varieties and cultivars in pepper. The agencies, which undertook commercial production of vine cuttings of, pepper other than KAU and IISR are the Spices Board through approved nurseries, ADF and private nurseries. But these agencies have to get the nucleus planting material from KAU and IISR for producing new varieties.

**Fig 26. Proposed model for marketing of planting material - Pepper**




IISR Indian Institute of Spices Research
ADF Agrl. Dept. Farm
PN Private Nursery
KAU Kerala Agricultural University

→ Channel

⇢ Feedback

The study revealed that in pepper, for local cultivars, fellow farmers were the most preferred source by the respondent farmers. ' Distance of the source' was the major constraint in getting vine cuttings of new varieties from KAU and IISR as perceived by the farmers. Hence KAU and IISR should take steps to make available the new varieties at the premises of the farmers. Establishment of demonstration plots of the new released varieties, which can also be used as mother plant gardens, is to be considered.

Since mother plant selection is the most important and crucial stage in propagation of pepper, quality control at this stage is necessary. The scientists of KAU/ IISR may be of help at this stage. Phyto – sanitary certification from the scientists should be made mandatory for mother plants to be used for producing vine cuttings. Commercial production and marketing of pepper cuttings may be undertaken only by nurseries approved by Spices Board and Department of Agriculture. Progressive farmer groups may also be entrusted with the task of production and distribution. Procurement and distribution of vine cuttings produced by KAU and IISR and approved nurseries at affordable price by the farmer groups/ Agri- Horti Society/ Primary Agricultral Credit Societies may be taken up.

As part of the marketing strategy, KAU and IISR should evolve suitable strategy for 'marketing the technology' generated by them. There should be a sound mechanism to convey the feed back from the stakeholders at various levels to the researchers. Pepper being influenced by agro- climate of a region, farmer participatory location specific breeding programmes is highly appreciated. Incorporating all these, a model for the distribution of planting materials of pepper has been developed (Fig 26.)

# Summary

# 6. SUMMARY

'Seed /planting material' is the basic input that holds the key to enhanced farm productivity and, in turn, to production. For efficient farming, adequate and timely supply of all agricultural inputs including seeds is required. Although quality seed/planting material has been recognized as the trigger point for improving production, economically, seed has not been studied as much as other inputs like fertilizers, pesticides, etc. The input supply system in agriculture suffers from serious shortcomings such as higher prices, inadequate supply and delays in supply, lack of quality standards, etc. Even the scattered and scanty studies conducted on seed marketing pertained to cereal crops and field crops like vegetables and cotton. The plantation crops sector, where the propagating materials are not seeds, but grafts, buds and seedlings remained largely neglected.

The major crops of commercial importance closely interwoven with the commerce and trade of Kerala are coconut, rubber, cashew and pepper. A handful of organizations like Kerala Agricultural University, Department of Agriculture, Commodity Boards and Central Institutes, apart from private nurseries are involved in the production and distribution of planting materials of these crops. But the various aspects of marketing of the planting materials by these agencies have not been studied in detail. Often the farmer-consumer is being cheated by unscrupulous elements in the planting material production and marketing field.

Taking into consideration the above aspects, the present study was undertaken with the following specific objectives:

1. to appraise the marketing practices of various organizations engaged in the marketing of planting materials of selected commercial crops,
2. to examine the source and variety preferences of farmers for planting materials,
3. to study the factors influencing source and variety preferences in relation with relevant marketing-mix elements,

4. to identify the problems and constraints in the marketing of planting materials and

5. to propose appropriate models for the marketing of planting materials.

The survey was conducted during the months, April to August 2000 in the districts of Kozhikkode, Kottayam, Kannur and Idukki. A total of 300 farmers (75 farmers each with coconut, rubber, cashew and pepper as major crop) were selected as the sample for the study following four stage random sampling procedure.

The marketing practices of the organizations were analysed by conducting interviews and discussions with the officers concerned in the organizations. All the Government Agencies in the study area and 30 private nurseries had been studied for understanding the marketing practices followed by them.

The farmers' preference for sources and varieties were measured by directing the farmers to indicate their preferences by giving scores out of 10. The total scores obtained by each source/ variety was calculated and were ranked based on certain indices developed.

The data were collected from the organizations and farmers using well-structured and pre-tested interview schedule developed for the purpose. Brain storming sessions were conducted to elucidate suggestions for improving the marketing of seeds/planting materials involving farmers, agricultural officers and researchers. The data were analyzed using bivariate tables, simple percentages and path analysis.

The salient findings of the study are furnished below:

1. The product mix of KAU, ADF and private nurseries in general included planting materials of coconut, pepper, cashew, arecanut, vegetables, fruits and ornamentals. Some private nurseries produced and distributed planting materials of rubber in addition to the above crops. The Rubber Board nursery produced and distributed the planting materials of rubber alone.

2. All the agencies in the public sector, KAU, ADF and the RB followed centralized production. Eighty seven per cent of the private nurseries followed centralized production and 13 per cent resorted to decentralized production.

3. None of the agencies undertook market survey before planning their production strategy.

4. The results showed that the KAU always distributed the materials produced by its own farms. ADF resorted to production and distribution (85%) and production, procurement and distribution (15%). About 40 per cent of the private nurseries undertook production and distribution and 57 per cent resorted to procurement and distribution.

5. The educational qualifications of the farm managers of the farms/nurseries revealed that post-graduates in Agriculture headed the KAU farms and graduates/post graduates in Agriculture managed ADF. A postgraduate in Botany managed the RB nursery. Non-professionals managed more than 80 per cent of the private nurseries.

6. The farm managers of KAU had 3-5 years experience whereas in the ADF it ranged from one year to more than five years. The private nursery managers had more than 10 years of experience in the field.

7. None of the farm managers had received in- service management training.

8. The factors influencing production planning other than the technical capabilities of farm managers were budget, quality, aptitudes of farm managers, availability of parent seed material, requirement for departmental schemes and the demand in the market.

9. The Government agencies followed Break-even method in fixing the selling price, whereas most of the private nurseries followed the production cost plus concept. The procedure for price determination varied with crops. The procedure followed for fixing the selling price of coconut seedlings by the ADF

was found to be scientific and unique. But such well-structured procedures were not practiced in the case of other crops.

10. The cost of production in Government agencies would be much on the higher side if establishment charges were included. But usually only the variable cost alone was reckoned in calculating the cost. For the private nurseries the production cost was found to be lower.

11. Sales outlets, fairs/ exhibitions, KB and NGOs were the distribution channels of planting material for KAU. The main channels through which planting materials from ADF were distributed were the KB (Dept. Schemes), local fairs, mobile unit and over the counter. The Rubber Board had only one channel, i.e. through its Regional office to farmers. Direct sales to farmers, retail vendors and to some extent Agricultural Department schemes constituted the distribution channels of private nurseries.

12. Announcements through radio, advertisement in print media and exhibitions and local fairs were the promotional methods adopted by KAU and ADF. Field officials of the RB were their main media for disseminating information. Private nurseries adopted banners and cinema theatre slide shows.

13. The support service provided by all the agencies was of the nature of providing technical advice alone except in the case of RB. Technical advice was given voluntarily in 50 per cent of the cases by KAU, 53 per cent by of the cases by ADF and 13 per cent of the cases by PN. Rubber Board gave technical advice voluntarily to all the farmers approaching the Board. The farmers approaching KAU expected to get advice/ information on all technical and cultivation aspects but could get only 50 per cent satisfaction.

14. The customer profile of the agencies revealed that small farmers constituted more than 50 per cent of the regular customers of KAU and private nurseries. Government agencies like Krishibhavan formed the major customer of ADF. Marginal farmers accounted nearly 30 per cent of the customer profile of KAU,

RB and PN. Large farmers constituted 36, 21, 12 and six per cent of the customers of RB, ADF, KAU and PN respectively.

15. Not much systematic attempts were made to collect the response from the farmers. The feed back about the performance of planting materials purchased from the KAU was obtained through first hand information from farmers and through telephone calls. ADF got 30 per cent of the feed back through its field staff and in another 30 per cent case the feedback was not collected. The field staff of the RB was instrumental in collecting 60 per cent of the feedback. In 50 per cent of the cases, the private nurseries did not get the feed back. The system of maintaining registers for entering the names and addresses of the farmers and their remarks have to be introduced at the sources of planting material supply.

16. Although Krishibhavans are not producing planting materials and were only serving as distribution outlet of the Agricultural Department, the farmers perceived them also as source of planting materials. The farmers also considered fellow farmers as a source of planting material. Coconut farmers preferred fellow farmers followed by KAU and ADF as sources for coconut seedlings. The RB followed by PN and FF were the source preference for rubber farmers. The cashew farmers preferred to purchase planting materials from KAU, followed by FF and ADF in that order, where as pepper farmers preferred FF followed by ADF as the source of planting material.

17. The preference of the farmers to source studied in terms of selected criteria showed that in the case of coconut with regard to preferred variety KAU got the first rank. Regarding quality of seedlings, credibility of the source and local availability, fellow farmers were the most preferred source. As far as affordable price was considered, KB got the first rank and for assured availability ADF got the first rank. The KB had been ranked last with regard to quality, preferred variety and confirmed availability.

18. The rubber farmers gave the first preference to RB with regard to quality, preferred variety and price and for credibility, local availability and confirmed

availability, the fellow farmers had been ranked first. But the criterion indices for RB, PN and FF did not have much variation.

19. For cashew, regarding quality, local availability, price and assured availability, the fellow farmers got the first rank. KAU was placed in the first position with regard to credibility and preferred variety.

20. As far as pepper was considered, the farmers gave first rank to fellow farmers with regard to all the factors. KAU was placed second with regard to quality, credibility and preferred variety. Except for local availability and affordable price, all the farmers had placed KB in the last position.

21. In general, it was found that in almost all the cases the path analysis was not effective as the residuals were very high except in the case of rubber where the path coefficient analysis of FF was found to be somewhat effective with a residual of 0.54.

22. The sources of information on availability of planting materials were print, radio, other farmers, extension officers and seminars and exhibitions. In the case of coconut, the information received from the sources except fellow farmers were largely inadequate. In the case of rubber, the information received from Rubber Board was reported to be adequate. In the case of ADF and private nurseries, the information about planting materials was largely inadequate.

23. Majority of the coconut, cashew and pepper farmers registered of 'low' to 'moderate' level of awareness about their awareness about varieties/cultivars of the selected crops. Majority of the rubber farmers fell in the 'moderate' to 'high' category of awareness about varieties/cultivars.

24. Except the Rubber Board, all other agencies had failed in convincing the farmers about the advantages of the varieties they had released. The extension wing of the K.A.U and the Agricultural Department had failed as agencies for transfer of technology.

25. The analysis proved that per se there are no quality standards fixed for the planting materials. Although the research system had developed specific criteria for selection of quality seedlings and grafts of coconut, cashew, pepper and rubber, many of them were not practical for commercial application. The research system and extension system should make sincere efforts to educate the farmers on the selection of quality seedlings/planting materials.

26. Labour related problems had been ranked first by KAU, ADF, RB as the major constraints in the production and distribution of planting materials. Difficulty in getting quality parent materials and lack of infrastructural facilities were the other major problems faced by the public sector.

27. The agencies had suggested conducting trainings to improve the skill of the workers from time to time.

28. The farmers pointed that 'lack of sufficient information' 'insufficiency of technical advice from the agencies' and 'low quality of the planting material supplied' were the major constraints faced by them.

29. The distances of the sources 'like KAU and IISR supplying quality planting material was the serious problem faced by cashew and pepper farmers.

30. The farmers perceived that the major problems encountered from KAU were 'lack of information about availability', 'distance of the production centres from the crop predominant district'.

31. 'Insufficient quantity' and 'non availability of preferred variety' were the major constraints in getting planting materials from Krishi Bhavan as perceived by the farmers.

32. 'Insufficient technical support', 'Distance' and 'lack of information on varieties' were the major problems in getting planting materials from Agricultural Department Farms according to farmers.

33. The major constraints confronted by the farmers from the private nurseries were 'lack of information on varieties' and 'insufficient technical support'.

34. As far as 'Fellow farmer' as a source were considered, the farmers opined that their single major constraint was 'insufficient technical support'.

35. While ranking the suggestions as perceived by the stakeholders, it was found that 'establishment of parent/clonal mother gardens' and 'selection and multiplication of seedlings in a decentralized manner' were ranked first by the respondents. 'Training to identified farmers and technical persons on scientific plant propagation techniques' was another suggestion.

36. The gap in technology transfer and adoption with regard to released varieties from KAU and other ICAR institutes was much wider which need to be narrowed. Demonstration plots of newly released varieties of crops along with recommended package of practices for cultivation have to be set up region wise to convince the farmers.

37. The authorities concerned should take initiative to 'publish a directory on reliable sources for planting materials' to eliminate unscrupulous elements in the nursery field and to help the farmers.

38. An accreditation system has to be introduced for the planting material producing and distributing organizations.

39. Appropriate models incorporating the various aspects of production and marketing at different levels have been suggested for marketing of planting materials.

**Implications of the study**

In this study, the marketing of planting materials of selected commercial crops has been studied. In order to study the marketing of the planting materials, it is worthwhile to know, the preferences of the farmers for the sources supplying planting

materials of coconut, rubber, cashew and pepper, and the awareness level of farmers about the cultivars and varieties of these crops. The factors influencing the farmers' preferences for sources and varieties, the marketing practices adopted by the agencies in the marketing of planting materials and the problems and constraints encountered by both the producers as well as the consumers in the planting material production field were the other aspects studied for streamlining the production and marketing of planting materials. It was observed from the findings of the study that, many of these questions have been answered satisfactorily. It is hoped that being an un-researched field, more studies in this line would be carried out by future researchers. The seed/planting material being recognized as an important input in modern agriculture, it should not be neglected any more. The economy now being dependent more on cash crops like coconut, rubber, coffee, tea and spices, which are also perennial crops, the planting materials of these crops warrant more care and attention. Necessary legislations have to be enacted without delay in order to protect the farmers from the unscrupulous elements in the field of seed/planting material production and sales.

**Suggestions for future research**

a) The study was confined to four crops. Therefore a comprehensive study including other commercially important crops should be undertaken.

b) Only the vegetatively propagated materials have been studied, but future studies can cover marketing of seeds of paddy and other cereals.

c) The present study attempted only to take a stock of the present marketing practices of agencies in the crop predominant districts, a crop-wise comprehensive study pertaining to the entire state may be taken up.

d) The scope of the present study was restricted to marketing. However, there is need to study the implications of the new IPR regime and breeders' as well as farmers' rights on the commercial production and marketing of plant parts.

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# Appendices

## APPENDIX - I

**Interview Schedule for data collection for the study on, 'MARKETING OF PLANTING MATERIALS FOR SELECTED COMMERCIAL CROPS IN KERALA'**

1. Name of Organization :

2. Year of establishment :

3. Type : Commodity Board/Government/KAU/ Co- operatives/Private/Others (Specify)

4. Area of operation : Regional wise/within state/outside state/ others (Specify)

5. Nature of business with respect to planting materials:

   a) Production & distribution
   b) Production, procurement & distribution
   c) Procurement & distribution
   d) Any other (Specify)

6. What are the different input services provided by your organization? Rank them in the order of importance.

   a) Supply of quality planting materials.
   b) Distribution of manures and fertilizers.
   c) Technical advice
   d) Financial aid
   e) Any other (Specify)

7. Do you undertake any production for catering to the requirement of Government institution or specific schemes?

8. Nature of production : Centralised/Decentralised/Contract

9. Production policy followed by your organization.

   - Production undertaken
     1. far in advance
     2. after receiving orders
     3. continuous production
     4. just in time
     5. others (specify)

10. Do you undertake market survey before production planning.:
    If 'Yes', how and when?

13. Do you maintain a production budget/estimate? : Y/N

14. Could you achieve the target always? Y/N
    If 'no', reasons for non-achievement – Rank them in the order of importance.

15. If distribution and supply alone is undertaken, how is the planting material arranged?

    a) Place of procurement/source
    b) Rate

16. What are the considerations in procurement? (Give marks out of 10 for each attribute)

    a) Quality
    b) Availability
    c) Demand/Preference in the market
    d) Finance available
    e) Quantity
    f) Others.

17. How is the purchasing rate fixed?

18. How is the quality of planting material assessed? (Crop wise)

    Coconut
    Pepper
    Cashew
    Rubber

19. Do you face any excess stock or stock out position: Y/N
    How do you manage the situation?

    a) Excess Stock
    b) Stock out position

20. How is the selling price fixed?

    a) Production/Procurement cost +Dist. Cost + a margin
    b) No-loss-profit
    c) Any other (Specify)

21. Do you supply at subsidized rate? Give the extent of subsidy.

22. Do you grade planting materials based on quality?

23. Do you practise differential pricing based on the grades?

24. Do you use any brand name/trade name? If yes, mention it.

25. Do you own vehicles for transportation?

26. If hired vehicles are used, how do you account for hiring charges?

27. Mention the channels of distribution

a) Direct selling to farmers/organizations
b) Through sales outlets/counters
c) Through Field Officers
d) In fairs or Exhibitions
e) Any other (Speficy)

29. What are the packaging materials/methods used for bulk consignments?

30. What are the storage facilities available?

31. What is the extent of damage in storage?

32. What are the promotional methods used by your organization for informing the farmer ?

a) Radio/TV
b) Advertisements in Newspaper/Periodicals
c) Field Officials
d) Any other (Specify)

33. Do you use point-of-purchase promotion methods (ie., like one seedling free with every five seedlings or so) Give details.

34. What are the 'after-sales' follow up services you render to your customers?

35. Who are your regular customers?

Small farmers/marginal farmers/Large farmers/Voluntary Organizations/
Govt. Agencies/Any other (specify)

36. Do you provide technical advice/after sales service to your customers? If yes, on what aspects?

37. What are the formal and informal methods employed to collect feedback (List out)

38. Give suggestions for improving customer satisfaction.

39. a. Who is in charge of production and planning?

b. What are the qualifications for the post?

40. How are the decision taken?

a) Autonomous Decision
b) Governing Body
c) In tune with government policy
d) Others (Specify)

41. What are the factors taken into consideration while making production decisions? Rank them in their order of importance.

42. Do you enjoy flexibility in decision making with regard to

a. demand/farmer preference
b. financial considerations
c. Any other (Specify)

43. What is your present market share?

44. Who is the market leader?

45. What are the constraints to,

- Production & / or Procurement
- Distribution/Selling.

(Rank the constraints in the order of importance.)

46. Give your suggestions to get rid of the constraints. (Rank them in the order of 'practicality')

47. Specify other matters coming in the domain, if any and your suggestions.

## APPENDIX - II

## MARKETING OF PLANTING MATERIALS FOR SELECTED COMMERCIAL CROPS IN KERALA

### Interview Schedule for Farmers

Panchayat : Block : District:

1. Name and address of the respondent :
2. Numbers of members in the family : Adult: Children:
3. Education of family head :
4. Occupation of the family head :
5. Monthly family income :

Main Occupation: Subsidiary Occupation:

6. Land holding pattern

| Category | Own | | Leased in | |
|---|---|---|---|---|
| | Irrigated | Unirrigated | Irrigated | Unirrigated |
| 1. Garden Land | | | | |
| 2. Wet Land | | | | |

7. Cropping pattern

| Crop / Details | Coconut | Rubber | Cashew | Pepper | Others |
|---|---|---|---|---|---|
| 1. Area (Cent) | | | | | |
| 2. Yielding (Nos.) | | | | | |
| 3. Non-yielding (Nos.) | | | | | |

8. List of sources supplying planting materials is given below. Rank them based on your preference. (Put marks of 100).

| Source | Preference |
|---|---|
| 1. Fellow Farmer | |
| 2. Private Nursery | |
| 3. Krishi Bhavan | |
| 4. Commodity Board | |
| 5. Kerala Agricultural University | |
| 6. Agricultural Department Farm | |

9. Criteria for preferring sources are given below. Prioritize the sources based on the criteria.

| Criteria / Source | Fellow Farmer | Private Nursery | Krishi Bhavan | Commodity Board | Kerala Agrl. University | Agrl. Dept. Farms |
|---|---|---|---|---|---|---|
| *Quality<br>*Credibility<br>*Preferred - variety<br>*Local - availability<br>*Price<br>*Confirmed - availability | | | | | | |

10. Quality indicators of the planting materials of the selected crops are given below. Please prioritize them giving ranks.

| Coconut | Rank | Rubber | Rank |
|---|---|---|---|
| * Age if seedlings (1 year) | | * Growth of bed eye | |
| * Collar girth | | * Angle of sprout | |
| * Medium sized nuts | | * Height of first whirl of leaves | |
| * Early splitting of leaves | | * General vigour of bedded stump | |
| * Any other | | | |

| Pepper | Rank | Cashew | Rank |
|---|---|---|---|
| * Mother vine | | * General vigour | |
| * Dark Green leaves | | * Un whirled tap root | |
| * Vigours cutting | | * Age of graft | |
| * Stout stem | | * Pencil thick scion | |
| * Healthy roots | | | |

11. Varieties/cultivars of the selected crops are given below. Indicate your awareness about them (Put 'v' mark in the appropriate column)

| Sl no | Crop | Aware | Somewhat aware | Not at all aware |
|---|---|---|---|---|
| 1 | Coconut<br>Local – WCT | | | |
| 2 | CDO | | | |
| 3 | CDG | | | |
| 4 | T x D | | | |
| 5 | D x T | | | |
| 6 | Komadan | | | |
| 7 | Kerasree | | | |
| 8 | Laksha ganga | | | |
| 9 | Kera ganga | | | |
| 10 | Anantha ganga | | | |

| | | | | |
|---|---|---|---|---|
| 1 | Rubber<br>RRII 1 | | | |
| 2 | RRIM 600 | | | |
| 3 | GT – 1 | | | |
| 4 | PB – 260 | | | |
| 1 | Cashew<br>Local | | | |
| 2 | Madakkathara | | | |
| 3 | Kanaka | | | |
| 4 | Priyanka | | | |
| 5 | Dhana | | | |
| 6 | Dharasree | | | |
| 1 | Pepper<br>Karimunda | | | |
| 2 | Panniyur | | | |
| 3 | Neelamundi | | | |
| 4 | Sreekara | | | |
| 5 | Balankotta | | | |
| 6 | Kottanadan | | | |

12. What is your most preferred variety/cultivar for each selected crop? Mention the reasons for preferring them.

Coconut

Rubber

Cashew

Pepper

13. Indicate the adequacy of advertisement about planting materials by the agencies given below.

| Agency | Adequate | Inadequate |
|---|---|---|
| Kerala Agriculture University | | |
| Krishi Bhavan | | |
| Private Nursery | | |
| Agricultural Department Farm | | |
| Commodity Boards | | |
| Others | | |

14. Sources of information about quality planting materials fro the agencies given below. Put 'v' mark against the appropriate answer.

| Agency / Source Information | KB | KAU | PN | ADF | CB | FF |
|---|---|---|---|---|---|---|
| Print | | | | | | |
| Electronic media | | | | | | |
| Periodicals | | | | | | |
| Agricultural officers | | | | | | |
| Seminar | | | | | | |
| Exhibitions | | | | | | |

15. Do you get timely information about the availability of planting material? (Put 'v' mark)

| Agency | Always | Sometimes | Never |
|---|---|---|---|
| Krishi Bhavan | | | |
| Private Nursery | | | |
| Kerala Agricultural University | | | |
| Agricultural Department Farm | | | |
| Commodity Board | | | |
| Fellow Farmers | | | |

16. Problems and constraints in the availability of planting materials from the sources identified are given below. Preference rank them putting scores out of 10.

| Problems/Constraints | KB | KAU | ADF | PN | FF |
|---|---|---|---|---|---|
| 1. Law quality | | | | | |
| 2. Lack of preferred variety | | | | | |
| 3. Insufficient quantity | | | | | |
| 4. More distance | | | | | |
| 5. High price | | | | | |
| 6. Insufficient Technical Support | | | | | |
| 7. Lack of Trust | | | | | |
| 8. Lack of relevant information | | | | | |

17. Technical services of the agencies are given below. Prioritize them based on the criteria given.

| Agency / Criterion | KB | KAU | CDB | ADF | PN | FF |
|---|---|---|---|---|---|---|
| * Interest | | | | | | |
| * Technical advice | | | | | | |
| * Frequent visit | | | | | | |
| * Leaf lets and pamphlets | | | | | | |
| * Training/Seminar | | | | | | |

18.Brainstorming session for registering the problems and solution in marketing of planting materials and suggestion for overcoming them.

## APPENDIX - III

**District wise list of agencies involved in production/distribution of planting materials in the study area**

| District | Agency/Organization | | | |
|---|---|---|---|---|
| | Kerala Agricultural University | Agricultural Dept. Farms | Commodity Board | Private nurseries (no) |
| Kozhikkode | Nil | DAF-Koothali<br>CN-Thikkodi | - | 4 |
| Kannur | Pepper Research Station, Panniyur | DAF-Thaliparamba<br>CN-Palayad | - | 17 |
| Iddukki | Cardamom Research station, Pampadumpara | DAF-Arikuzha<br>SSF-Karimannoor<br>SVF-Vandiperiyar | - | 5 |
| Kottayam | Nil | Nil | Rubber Board | 11 |

## APPENDIX - IV

**List of approved cashew nurseries in Kerala**

Government sector

Cashew Research Station, Madakkathara, Trichur – 680 651
Cashew Research Station, Anakkayam, Malappuram
Cashew Projeny Orchard, Dept. of Agriculture, Adhur
Cashew Projeny Orchard, Dept. of Agriculture, Gullimikha
Central State Farm, Aralam P.O., Kannur – 670 673
District Agricultural Farm, Dept. of Agriculture, Chelakkara
District Agricultural Farm, Dept. of Agriculture, Chungathara
District Agricultural Farm, Dept. of Agriculture, Koothali
District Agricultural Farm, Dept. of Agriculture, Mavelikkara
District Agricultural Farm, Dept. of Agriculture, Taliparamba, Cannanore
District Agricultural Farm, Dept. of Agriculture, Anchal
Farming System Research Station, Krishi Vigyan Kendra, Sadanandapuram P.O., Kottarakkara
Regional Agricultural Research Station, Pilicode, Kasargod – 671 353
Seed Garden Complex, Dept. of Agriculture, Munderi, Malappuram

Private sector

Agro Crafts, Prop. Sri. K.I. James, Kakkanattil House, Piravam – 686 664.
Ph: 0485-242255

Agro Links,Prop. Smt. Annamma Baby, Kakkanattil House, Piravam. Ph: 0485-242367

Kallivayalil Nursery, Prop. Sri. K. Micheal George, Aryaparamba, Vayanoor P.O., (Via) Kollayad, Kannur.

**List of nurseries under Rubber Board in Kerala**

| Sl.No. | Name of Nursery | Location |
|---|---|---|
| 1 | Central Nursery, Karikkattor | Kottayam Dt. , Kerala |
| 2 | Regional Nursery, Kadackamon | Kollam Dt. , Kerala |
| 3 | Regional Nursery, Perumpulickal | Pathanamthitta Dt. , Kerala |
| 4 | Regional Nursery, Kanhikulam | Palakkad Dt. , Kerala |
| 5 | Regional Nursery, Manjeri | Malappuram Dt. , Kerala |
| 6 | Regional Nursery, Peruvannamoozhy | Kozhikode Dt. , Kerala |
| 7 | Regional Nursery, Ulikkal | Kannur Dt. , Kerala |
| 8 | Regional Nursery, Alakode | - do - |

## APPENDIX -V

**Matrix of direct & indirect effects of the criteria on the preference for sources - KB**

| Crop / Criteria | Coconut | | | | | |
|---|---|---|---|---|---|---|
| | X1 | X2 | X3 | X4 | X5 | X6 |
| X1Quality | -0.3717 | 0.0885 | 0.0316 | 0.0709 | -0.0078 | 0.0429 |
| X2 Credibility | -0.2886 | 0.1140 | 0.0312 | 0.0893 | -0.0109 | 0.0314 |
| X3 Preferred variety | -0.0935 | 0.0283 | 0.1257 | -0.0333 | 0.0378 | 0.0474 |
| X4 Local availability | -0.1347 | 0.0520 | -0.0214 | 0.1956 | -0.0356 | -0.0260 |
| X5 Price | 0.0259 | -0.0112 | 0.0426 | -0.0625 | 0.1114 | 0.0133 |
| X6 confirmed availability | -0.1630 | 0.0366 | 0.0610 | -0.0521 | 0.0152 | 0.0978 |
| Residual = O.9169 | | | | | | |
| | Pepper | | | | | |
| X1Quality | -0.0250 | 0.0869 | -0.0267 | 0.0041 | -0.0862 | -0.0987 |
| X2 Credibility | -0.0174 | 0.1247 | -0.0309 | -0.0014 | -0.0757 | -0.1528 |
| X3 Preferred variety | -0.0115 | 0.0663 | -0.0581 | -0.0007 | -0.0302 | -0.1840 |
| X4 Local availability | 0.0014 | 0.0023 | -0.0005 | -0.0757 | 0.0076 | 0.0137 |
| X5 Price | -0.0134 | 0.0587 | -0.0109 | 0.0036 | -0.1607 | -0.0789 |
| X6 confirmed availability | -0.0067 | 0.0521 | -0.0292 | 0.0028 | -0.0347 | -0.3658 |
| Residual = 0.8270 | | | | | | |
| | Cashew | | | | | |
| X1Quality | -0.0602 | -0.2070 | 0.0103 | 0.0363 | -0.0036 | -0.0114 |
| X2 Credibility | -0.0447 | -0.2791 | 0.0109 | 0.0405 | -0.0066 | -0.0256 |
| X3 Preferred variety | -0.0349 | -0.1718 | 0.0177 | 0.0084 | -0.0055 | -0.0553 |
| X4 Local availability | -0.0166 | -0.0861 | 0.0011 | 0.1315 | 0.0018 | -0.0005 |
| X5 Price | -0.0070 | -0.0600 | 0.0032 | -0.0077 | -0.0305 | 0.0004 |
| X6 confirmed availability | -0.0060 | -0.0621 | 0.0085 | 0.0006 | 0.0001 | -0.1151 |
| Residual = 0.8779 | | | | | | |
| **Matrix of direct and indirect effects of the criterion on the preference for sources - PN** | | | | | | |
| | Coconut | | | | | |
| X1Quality | 0.1698 | 0.0970 | -0.0176 | -0.0246 | 0.0143 | -0.0818 |
| X2 Credibility | 0.1319 | 0.1249 | -0.0174 | -0.0309 | 0.0201 | -0.0599 |
| X3 Preferred variety | 0.0427 | 0.0310 | -0.0701 | 0.0116 | -0.0698 | -0.0906 |
| X4 Local availability | 0.0615 | 0.0570 | 0.0120 | -0.0678 | 0.0657 | 0.0497 |
| X5 Price | -0.0118 | -0.0122 | -0.0238 | 0.0216 | -0.2058 | -0.0254 |
| X6 confirmed availability | 0.0745 | 0.0401 | -0.0340 | 0.0180 | -0.0280 | -0.1867 |
| Residual = 0.8795 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Rubber | | | | | | |
| X1Quality | -0.0546 | -0.3706 | -0.0932 | 0.0036 | 0.1383 | -0.0194 |
| X2 Credibility | -0.0483 | -0.4197 | -0.0882 | 0.0030 | 0.1572 | -0.0070 |
| X3 Preferred variety | -0.0355 | -0.2579 | -0.1436 | 0.0044 | 0.1647 | 0.0165 |
| X4 Local availability | 0.0316 | -0.2026 | -0.1010 | 0.0062 | 0.1879 | 0.0111 |
| X5 Price | -0.0266 | -0.2322 | -0.0832 | 0.0041 | 0.2841 | 0.0230 |
| X6 confirmed availability | 0.0124 | 0.0343 | -0.0277 | 0.0008 | 0.0767 | 0.0853 |
| Residual = 0.7672 | | | | | | |
| Pepper | | | | | | |
| X1Quality | -0.4870 | 0.1272 | -0.0241 | -0.0031 | 0.0775 | 0.0102 |
| X2 Credibility | -0.2692 | 0.2303 | -0.0170 | -0.0039 | 0.0586 | -0.0282 |
| X3 Preferred variety | -0.1225 | 0.0408 | -0.0959 | -0.0057 | 0.0361 | -0.0099 |
| X4 Local availability | -0.0627 | 0.0368 | -0.0228 | -0.0241 | 0.0024 | -0.0521 |
| X5 Price | -0.2077 | 0.0742 | -0.0190 | -0.0003 | 0.1817 | -0.0572 |
| X6 confirmed availability | 0.0158 | 0.0206 | -0.0030 | -0.0040 | 0.0330 | -0.3143 |
| Residual = 0.7690 | | | | | | |
| Cashew | | | | | | |
| X1Quality | 0.1508 | -0.1790 | 0.0281 | -0.0210 | 0.0110 | 0.0050 |
| X2 Credibility | 0.1296 | -0.2084 | 0.0309 | -0.0197 | 0.0091 | 0.0037 |
| X3 Preferred variety | 0.0692 | -0.1052 | 0.0612 | -0.0235 | 0.0106 | 0.0346 |
| X4 Local availability | 0.0668 | -0.0864 | 0.0302 | -0.0475 | 0.0091 | 0.0266 |
| X5 Price | 0.0835 | -0.0954 | 0.0327 | -0.0219 | 0.0198 | 0.0304 |
| X6 confirmed availability | 0.0100 | -0.0103 | 0.0281 | -0.0168 | 0.0080 | 0.0752 |
| Residual = 0.9784 | | | | | | |
| **Matrix of direct and indirect effects of the criterion on the preference for sources –FF** | | | | | | |
| Coconut | | | | | | |
| X1Quality | 0.2478 | -0.1259 | -0.1262 | -0.0290 | -0.0167 | 0.0423 |
| X2 Credibility | 0.1924 | -0.1621 | -0.1246 | -0.0365 | -0.0235 | 0.0310 |
| X3 Preferred variety | 0.0623 | -0.0403 | -0.5018 | 0.0136 | 0.0851 | 0.0469 |
| X4 Local availability | 0.0898 | -0.0740 | 0.0855 | -0.0800 | -0.0767 | -0.0257 |
| X5 Price | -0.0172 | 0.0159 | -0.1703 | 0.0255 | 0.2402 | 0.0132 |
| X6 confirmed availability | 0.1087 | -0.0520 | -0.2434 | 0.0213 | 0.0327 | 0.0966 |
| Residual = 0.7837 | | | | | | |
| Rubber | | | | | | |
| X1Quality | -0.7073 | 0.1141 | 0.0351 | 0.0008 | -0.0122 | -0.080 |
| X2 Credibility | -0.4723 | 0.1708 | 0.0629 | 0.0017 | -0.0106 | -0.113 |

| | | | | | | |
|---|---|---|---|---|---|---|
| X3 Preferred variety | -0.2552 | 0.1104 | 0.0973 | 0.0031 | -0.0045 | -0.114 |
| X4 Local availability | -0.0987 | 0.0537 | 0.0546 | 0.0055 | 0.0021 | -0.042 |
| X5 Price | -0.3839 | 0.0802 | 0.0194 | -0.0005 | -0.0225 | -0.073 |
| X6 confirmed availability | -0.3098 | 0.1051 | 0.0606 | 0.0013 | -0.0090 | -0.184 |
| Residual = 0.5474 | | | | | | |
| Pepper | | | | | | |
| X1Quality | -0.3867 | 0.3127 | 0.0291 | -0.4131 | 0.0043 | 0.0934 |
| X2 Credibility | -0.2820 | 0.4289 | 0.0415 | -0.5081 | 0.0129 | 0.1629 |
| X3 Preferred variety | -0.1740 | 0.2754 | 0.0646 | -0.4160 | 0.0149 | 0.1474 |
| X4 Local availability | -0.2173 | 0.2965 | 0.0365 | -0.7350 | 0.0093 | 0.1787 |
| X5 Price | -0.0330 | 0.1112 | 0.0193 | -0.1368 | 0.0499 | 0.0311 |
| X6 confirmed availability | -0.0985 | 0.1905 | 0.0260 | -0.3582 | 0.0042 | 0.3667 |
| Residual = 0.5610 | | | | | | |
| Cashew | | | | | | |
| X1Quality | -0.2994 | -0.1112 | 0.0880 | -0.0002 | -0.0888 | 0.0029 |
| X2 Credibility | -0.1499 | -0.2223 | 0.1447 | -0.0005 | -0.0708 | 0.0072 |
| X3 Preferred variety | -0.1019 | -0.1244 | 0.2586 | -0.0009 | -0.0567 | 0.0086 |
| X4 Local availability | -0.0295 | -0.0433 | 0.1017 | -0.0024 | -0.0435 | 0.0087 |
| X5 Price | -0.1027 | -0.0608 | 0.0566 | -0.0004 | -0.2588 | 0.0070 |
| X6 confirmed availability | -0.0504 | -0.0940 | 0.1303 | -0.0012 | -0.1058 | 0.0171 |
| Residual = 0.7259 | | | | | | |
| **Matrix of direct and indirect effects of the criterion on the preference for sources-KAU** | | | | | | |
| Coconut | | | | | | |
| X1Quality | 0.2421 | -0.1594 | 0.0859 | -0.0274 | 0.0177 | -0.0405 |
| X2 Credibility | 0.1880 | -0.2053 | 0.0848 | -0.0345 | 0.0249 | -0.0297 |
| X3 Preferred variety | 0.0609 | -0.0510 | 0.3416 | 0.0129 | -0.0862 | -0.0449 |
| X4 Local availability | 0.0878 | -0.0937 | -0.0582 | -0.0757 | 0.0811 | 0.0246 |
| X5 Price | -0.0168 | 0.0201 | 0.1159 | 0.0242 | -0.2540 | -0.0126 |
| X6 confirmed availability | 0.1062 | -0.0659 | 0.1657 | 0.0201 | -0.0346 | -0.0925 |
| Residual = 0.8727 | | | | | | |
| Pepper | | | | | | |
| X1Quality | -0.0341 | -0.0906 | 0.0173 | -0.0310 | -0.0795 | -0.0209 |
| X2 Credibility | -0.0255 | -0.1212 | 0.0250 | -0.0196 | -0.0929 | -0.0082 |

| | | | | | | |
|---|---|---|---|---|---|---|
| X3 Preferred variety | -0.0069 | -0.0353 | 0.0858 | 0.0109 | -0.0013 | 0.0724 |
| X4 Local availability | -0.0116 | -0.0261 | -0.0103 | -0.0907 | -0.0881 | 0.0025 |
| X5 Price | -0.0141 | -0.0585 | 0.0006 | -0.0415 | -0.1924 | 0.0242 |
| X6 confirmed availability | 0.0053 | 0.0073 | 0.0459 | -0.0017 | -0.0345 | 0.1353 |
| Residual = 0.8559 | | | | | | |
| Cashew | | | | | | |
| X1Quality | -0.3023 | 0.0091 | -0.0129 | 0.0139 | 0.0081 | 0.0196 |
| X2 Credibility | -0.2355 | 0.0117 | -0.0128 | 0.0248 | 0.0105 | 0.0147 |
| X3 Preferred variety | -0.1577 | 0.0060 | -0.0247 | 0.0548 | 0.0084 | 0.0236 |
| X4 Local availability | -0.0182 | 0.0013 | -0.0059 | 0.2301 | 0.0277 | 0.0038 |
| X5 Price | -0.0497 | 0.0025 | -0.0042 | 0.1299 | 0.0491 | 0.0047 |
| X6 confirmed availability | -0.0802 | 0.0023 | -0.0079 | 0.0119 | 0.0031 | 0.0740 |
| Residual = 0.8583 | | | | | | |

**Matrix of direct and indirect effects of the criterion on the preference for sources- ADF**

| | | | | | | |
|---|---|---|---|---|---|---|
| Coconut | | | | | | |
| X1Quality | -0.1787 | 0.0923 | 0.0104 | -0.0125 | -0.0045 | 0.0056 |
| X2 Credibility | -0.1387 | 0.1189 | 0.0103 | -0.0157 | -0.0064 | 0.0041 |
| X3 Preferred variety | -0.0449 | 0.0295 | 0.0414 | 0.0059 | 0.0220 | 0.0062 |
| X4 Local availability | -0.0647 | 0.0543 | -0.0071 | -0.0344 | -0.0207 | -0.0034 |
| X5 Price | -0.0124 | -0.0116 | 0.0140 | 0.0110 | 0.0649 | 0.0018 |
| X6 confirmed availability | -0.0783 | 0.0381 | 0.0201 | 0.0092 | 0.0089 | 0.0129 |
| Residual = 0.9764 | | | | | | |
| Pepper | | | | | | |
| X1Quality | -0.1091 | -0.0144 | 0.0720 | 0.0167 | -0.0106 | 0.0634 |
| X2 Credibility | -0.0777 | -0.0202 | 0.0809 | 0.0193 | -0.0301 | 0.0682 |
| X3 Preferred variety | -0.0480 | -0.0100 | 0.1637 | 0.0123 | 0.0067 | 0.0776 |
| X4 Local availability | -0.0240 | -0.0051 | 0.0264 | 0.0759 | -0.0358 | 0.0298 |
| X5 Price | -0.0093 | -0.0049 | -0.0087 | 0.0218 | -0.1248 | 0.0559 |
| X6 confirmed availability | -0.0481 | -0.0096 | 0.0883 | 0.0157 | -0.0485 | 0.1439 |
| Residual = 0.9354 | | | | | | |
| Cashew | | | | | | |
| X1Quality | -0.1961 | -0.2187 | 0.1252 | 0.0303 | 0.0318 | 0.0133 |
| X2 Credibility | -0.1531 | -0.2802 | 0.1223 | 0.0240 | 0.0342 | 0.0149 |

| | | | | | | |
|---|---|---|---|---|---|---|
| X3 Preferred variety | -0.1322 | -0.1844 | 0.1858 | 0.0258 | 0.0241 | 0.0169 |
| X4 Local availability | -0.1158 | -0.1314 | 0.0935 | 0.0512 | 0.0485 | 0.0106 |
| X5 Price | -0.0514 | -0.0788 | 0.0368 | 0.0205 | 0.1215 | 0.0086 |
| X6 confirmed availability | -0.0489 | -0.0785 | 0.0590 | 0.0102 | 0.0196 | 0.0532 |
| Residual = 0.8977 | | | | | | |
| | | | Rubber* | | | |
| X1Quality | -0.6416 | 0.0594 | 0.2113 | 0.0093 | -0.0275 | 0.1812 |
| X2 Credibility | -0.5400 | 0.0705 | 0.2148 | 0.0003 | -0.0514 | 0.1873 |
| X3 Preferred variety | -0.4918 | 0.0550 | 0.2757 | 0.0046 | -0.0492 | 0.2121 |
| X4 Local availability | -0.0419 | 0.0001 | 0.0090 | 0.1426 | -0.0544 | -0.0459 |
| X5 Price | -0.1126 | 0.0232 | 0.0867 | 0.0496 | -0.1564 | 0.0832 |
| X6 confirmed availability | -0.3491 | 0.0397 | 0.1757 | -0.0197 | -0.0391 | 0.3330 |
| Residual = 0.8210 | | | | * Rubber Board | | |

# MARKETING OF PLANTING MATERIALS FOR SELECTED COMMERCIAL CROPS IN KERALA

By

**A. PREMA**

## ABSTRACT OF THE THESIS

**Submitted in partial fulfilment of the requirement for the degree of**

# Doctor of Philosophy in Rural Marketing Management

**Faculty of Agriculture**
**Kerala Agricultural University**

**Department of Rural Marketing Management**
**COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT**
VELLANIKKARA, THRISSUR - 680 656
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**2002**

# ABSTRACT

The study on "Marketing of planting materials for selected commercial crops in Kerala" was undertaken to analyze the various aspects of marketing of planting materials by the organizations engaged in the commercial production and distribution of planting materials of coconut, rubber, cashew and pepper. The source and variety preference of the farmers as well as the problems and constraints experienced by the producers and the farmer-consumers were also identified. The preference to source was measured in terms of quality, preferred variety, price, local availability and confirmed availability of planting material from the source. Based on the findings of the study appropriate models have been suggested for the marketing of planting materials.

The study was conducted in the districts of Kozhikkode, Kottayam, Kannur and Idukki, which represented the four selected crops. The sample size was 300 farmers consisting of 75 farmers each of the selected crop. All the farms in the Government sector and 30 private nurseries in the study area were also subjected to in-depth study. Data were collected using interview schedules and suitable statistical techniques were employed in the analysis of the data.

The study revealed that all the agencies in the Government sector, the Kerala Agricultural University, Agricultural Department Farms and the Rubber Board and 87 per cent of the private nurseries followed centralized production. None of the agencies undertook market survey before planning their production strategy. The Government sector agencies followed the Break-even method of pricing, whereas the private nurseries followed the production cost plus concept.

The extension and field network of the Rubber Board was the most efficient one among the agencies studied generally disseminating the technology when compared to similar agencies in the field. The agencies did not make any systematic attempt to collect the feed back from the farmers. The farmers' preference for the sources varied with the crops. Most of the selected explanatory variables did not contribute substantially to farmers' preference to source, except the factor 'quality'.

The awareness of farmers about the varieties and cultivars of crops was 'low to moderate' except for rubber. The visual indicators for selecting quality planting materials developed by the researchers had not percolated to the farmers yet. There is no existing quality control and certification mechanism to prevent unscrupulous elements in the field of planting material production and marketing. The analysis of the constraints experienced by the agencies revealed that labour related issues, difficulty in getting quality parent materials and lack of sufficient infrastructure facilities to undertake production were their major problems. The major problems felt by the farmers were 'lack of sufficient information', 'insufficiency of technical advice from the agencies' and 'low quality of planting materials'.

The results point out vividly to the prime need for a more systematic and effective marketing of planting materials with sufficient room for ensuring quality control and better coordination and supervision at all levels of production and distribution of planting materials by the scientists as well as extension personnel in order to improve the agricultural production, and ultimately the income of the farmer.