

# **PRODUCTION AND MARKETING OF PINEAPPLE IN TRICHUR DISTRICT**

BY  
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## **THESIS**

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DECLARATION

I hereby declare that this thesis entitled "Production and Marketing of Pineapple in Trichur District" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

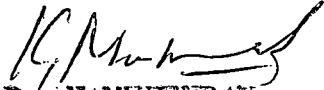
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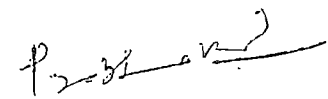
We, the undersigned, members of the Advisory Committee of Kum.Jesy Thomas K., a candidate for the degree of Master of Science in Agriculture with major in Agricultural Economics, agree that the thesis entitled "Production and Marketing of Pineapple in Trichur District" may be submitted by Kum.Jesy Thomas K. in partial fulfillment of the requirement for the degree.



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# *Introduction*

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## INTRODUCTION

The importance of fruits and vegetables for improving the nutritive value of diet needs no emphasis and the general public is only beginning to realize the importance of including fresh fruits and vegetables in their regular diet. The demand for fruits is thus increasing particularly among the educated classes and will continue to increase as income increases and knowledge of their value spreads. The health giving character of some fruits has been rather widely recognized, but many people still regard fruits as a luxury rather than a food which should form part of the daily diet. Most fruits contain considerable amounts of sugar or starch or both and it is largely those which furnish the calories. Certain minerals and vitamins are necessary for the maintenance of health and most fruits are valuable sources of such minerals and vitamins.

Fruit growing is more profitable than most forms of agriculture and it makes possible for a family to secure an adequate income from an average holding. Production and productivity should be increased until the price of fruit falls to a level

at which a progressive grower can still make a satisfactory profit and all the people can afford to eat the fruit which is necessary for their health.

Pineapple, a tropical fruit, is the only member of the family Bromeliaceae of any great importance. Pineapple can be consumed as a fresh fruit, but most of the crop is canned, and canned pineapple is also of very high quality.

Pineapple thrives in a mild tropical climate. Strong sunshine is not desirable. Complete shade is also not suitable, but in India, it is grown in partial shade. In Kerala State, where the rainfall is heavy, it is grown as an intercrop with banana and coconut. Pineapple is grown in very poor soils. In fact, the quality of the fruit grown on light soils is considered to be superior. In India, sandy and loamy soils and laterite soils on the hill slopes in South India have been found very suitable. Pineapple is propagated by means of crowns, slips and suckers. The season for planting is May-June and planting is avoided during heavy rains. The plants reach fruiting maturity in 18 to 20 months. The fruit is harvested when it turns greenish yellow and the leaf like scales around the eyes on the surface of the

fruit dry up at the ends. It requires heavy manuring and irrigation during dry months.

The ten principal production areas of pineapple lie in a belt around the globe, extending  $30^{\circ}$  in latitude north and south of the Equator. The areas where pineapple is grown in order of their contribution to world supply of canned pineapple together with the varieties grown in each area are given in Table 1.1. The great centres of the canning industry are in Hawaii and Singapore and in neither would it be possible to grow pineapple except on a small scale were they sold only as fresh fruit.

In India, pineapple is grown in Kerala, Assam, Coastal Andhra Pradesh, Tamil Nadu and West Bengal. The yield of pineapple in India is rather low, varying from 8 to 25 tons per hectare. The most important variety is Giant kew or Smooth Cayenne having large fruits with an average weight of 3 to 4 kg each. Mauritius is another variety having fruits of  $1\frac{1}{2}$  to 3 kg weight. The variety Queen has small fruits of excellent quality weighing from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  kg each. Ripley Queen and Red and green Ripley are related to this variety and are found in some parts of India.

Table 1.1 Pineapple growing areas in the world in the order of their contribution to world supply.

Sl. No.	Country	Variety
1	Hawaii	Cayenne and Hilo
2	Philippines	Cayenne
3	Malaya	Singapore spanish
4	Australia	Cayenne and Queen
5	South Africa	Cayenne and Queen
6	Puerto Rico	Cayenne and Queen
7	Kenya	Cayenne
8	Mexico	Cayenne
9	Cuba	Cayenne and Red Spanish
10	Formosa	Cayenne
11	India	Smooth Cayenne

In Kerala, pineapple cultivation is practised in almost all districts. The district-wise area under pineapple along with their percentage is given in Table 1.2. The highest area under pineapple in Kerala is in Cannanore district with 1169 ha, which is about 20.12 per cent of the total area, followed by Quilon with 880 ha (15.15 per cent of the total).

The present trend in pineapple culture is toward expansion in production to supply canned pineapple for an apparently increasing market demand. The pineapple industry is faced with various problems relating to its production, marketing and processing. While cultivators have labour problems, and problems with regard to price fluctuations of the produce, the processors do not get enough fruits to meet their demand. Studies relating to these aspects are absent and the present study aims to look into these problems and find ways and means to solve these problems. The results of the study would throw light on the cost of cultivation and related aspects, marketing and the problems if any, facing the growers. Suggestions could be made to solve these problems and for better utilization of resources. The specific objectives of the study are given below.



Table 1.2 District-wise area under pineapple in Kerala (1979-'80)

District	Area in ha	Percentage
Trivandrum	469	8.07
Quilon	880	15.15
Alleppey	310	5.34
Kottayam	574	9.88
Idukki	360	6.20
Ernakulam	584	10.05
Trichur	485	8.35
Palghat	156	2.69
Malappuram	251	4.32
Kozhikodé	571	9.83
Cannanore	1169	20.12
Total for State	5809	100.00

Source: Farm Guide, 1982. pp.13

1. to estimate costs and returns of pineapple cultivation.
2. to estimate marketing costs and price spreads
3. to study the marketing channels
4. to identify the production and marketing problems of pineapple cultivators

A study to fulfil these objectives needs data on various items of costs and relating to all aspects, as they occur at different stages. The data collected from the pineapple growers in Trichur district were used for the purpose of the study.

Pineapple is grown in Trichur as a pure crop in most of the areas. Pineapple cultivation is confined to the taluks of Thalappilly, Trichur and Mukundapuram. Trichur had an area of 1475 hectares, producing about 22125 MT of fruits in 1975-76. Due to various reasons, pineapple area in Trichur has been declining and in 1979-80 it was 485 hectares. However, a large number of pineapple canning factories are located in Trichur district.

This thesis is divided into six chapters including the introductory chapter. A brief description of the agro-climatic and economic aspects of Trichur district is given in Chapter-2. The relevant

literature has been reviewed in Chapter 3. Chapter-4 deals with the method of analysis followed in the study. The results and discussion part of the study incorporated as Chapter-5 cover a description of the sample farmers, cost of cultivation, cost of production, capital productivity and resource-use efficiency. The marketing aspects as well as the problems faced by the cultivators are also included in this chapter. Chapter-6 deals with the summary of the major findings of the study.

# *A Description of the Study Area*

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## A DESCRIPTION OF THE STUDY AREA

In the present chapter, a brief description of the study area is attempted. It is hoped that it will provide a useful background information to the details that follow.

Trichur district is located in the centre of the State of Kerala. The district is bounded on the north by Palghat and Malappuram districts and on the east by Palghat district. Ernakulam and Idukky districts lie to the southern side and Arabian sea to the west. The district lies between north latitude  $10^{\circ}$  and  $10^{\circ} 4'$  and east longitude  $75^{\circ} 57'$  and  $76^{\circ} 54'$ .

There are five taluks in the district, viz., Talappilly, Trichur, Chavakkad, Kodungallur and Mukundapuram comprising 74, 72, 30, 18 and 37 villages respectively. The headquarters of the taluks are respectively Wadakkanchery, Trichur, Chavakkad, Kodungallur and Irinjalakkuda.

The total geographical area of the district is 2993.90 sq.km. which forms 7.8 per cent of the total area of the State. The district can be divided into three natural divisions viz., 1. Highland 2. Lowland and 3. Midland. Valuable trees like teak, ebony etc.

are grown in the high lands. Tea, coffee and rubber are the main crops in this region. In midland plains coconut, arecanut, cashew and other perennial cash crops are grown. Paddy is cultivated in midland regions and in valley. The district enjoys a total coastline of 51.5 km which extends from Chavakkad in the north to Kodungallur in the south.

The climate is tropical and humid with an oppressive hot season. The rainfall is seasonal and fairly assured. The average daily maximum temperature in March and April which are generally the hottest months is about  $31^{\circ}\text{C}$  to  $32^{\circ}\text{C}$  in the coastal regions and about  $36^{\circ}\text{C}$  to  $37^{\circ}\text{C}$  in the interior. The distribution of monthly rainfall in Trichur district is given in Table 2.1.

The soil of the district is broadly divided into four types namely sandy, alluvial, laterite and forest soils. The soil of Trichur and Talappilly taluks are mostly laterite in nature, while alluvial soil occur in the low lying areas of Trichur and Mukundapuram taluks and enriched with organic matter, nitrogen and potash, but deficient in phosphorus and calcium.

Bharathapuzha, the longest river flows westwards at the northern boundary and Periyar also flows westwards

Table 2.1 Average monthly rainfall for Trichur district - 1980

Month	Rainfall (in mm)
January	--
February	--
March	--
April	84.0
May	103.0
June	1107.6
July	1255.9
August	716.0
September	261.2
October	447.1
November	239.0
December	2.0

Source Farm Guide, 1982 pp.36

at the southern boundary of the district. Kecheri, Karuvannur and Chalakudy are the other rivers in Trichur.

The total population of the district as per 1981 census is 24.37 lakhs, with 78.88 per cent of the population living in rural areas and the rest 21.12 per cent in urban areas. Trichur district has a high literacy rate of 74.38 per cent. It is 70.81 per cent in rural areas and 77.94 per cent in urban areas. Density of population in rural areas is 682 per km<sup>2</sup> and 2404 per km<sup>2</sup> in urban areas, with 804 per km<sup>2</sup> for the district as a whole. The total number of workers in the district according to 1981 census is 645334 of which 60878 are cultivators, 164845 agricultural labourers and 419611 employed in other sectors.

The land use pattern of Trichur district is shown in Table 2.2. The net sown area forms only 52.39 per cent of the total geographical area. About 35 per cent of the area is under forests. The cropping pattern of Trichur district, showing the area under different crops and their percentages to total is given in Table 2.3. Rice is the most important crop (110654 ha) grown with 48.32 per cent of the total cropped area under its cultivation. The total area



Table 2.2 Land use pattern of Trichur district during the year 1979-80

Particulars	Area in hectares	Percentage to total area
Total geographical area	299390	100.00
Area under forest	103619	34.61
Land put to non-agricultural uses	21365	7.13
Barren and uncultivable lands	2269	0.76
Permanent pastures and other grazing lands	225	0.08
Land under miscellaneous tree crops	1431	0.48
Cultivable waste land	5141	1.72
Fallow and other current fallows	3112	1.04
Current fallows	4310	1.44
Net area sown	157918	52.74
Area sown more than once	79177	26.45
Total cropped area	237095	79.19

Source Trichur district Annual Plan, 1981-'82

Table 2.3 Cropping pattern in Trichur district for the year 1979-'80

Crop	Area in hectares	Percentage to total cropped area
Rice	110654	48.32
Tapioca	6673	2.91
Pulses	3259	1.42
Pepper	3727	1.63
Condiments and spices	744	0.33
Arecanut	6774	2.96
Tamarind	1047	0.46
Mango	4645	2.03
Jack	3884	1.70
Banana	1380	0.60
Pineapple	485	0.21
Other fruits	5113	2.23
Cashew nuts	7127	3.11
Vegetables	4190	1.83
Sugar crops	1120	0.49
Other food crops	193	0.08
Total food crops	161015	70.31
Coconut	53549	23.39
Other oil seeds	1632	0.71
Rubber	8950	3.91
Other plantation crops	1369	0.60
Other nonfood crops	2480	1.08
Total nonfood crops	67980	29.69
Total cropped area	228995	100.00

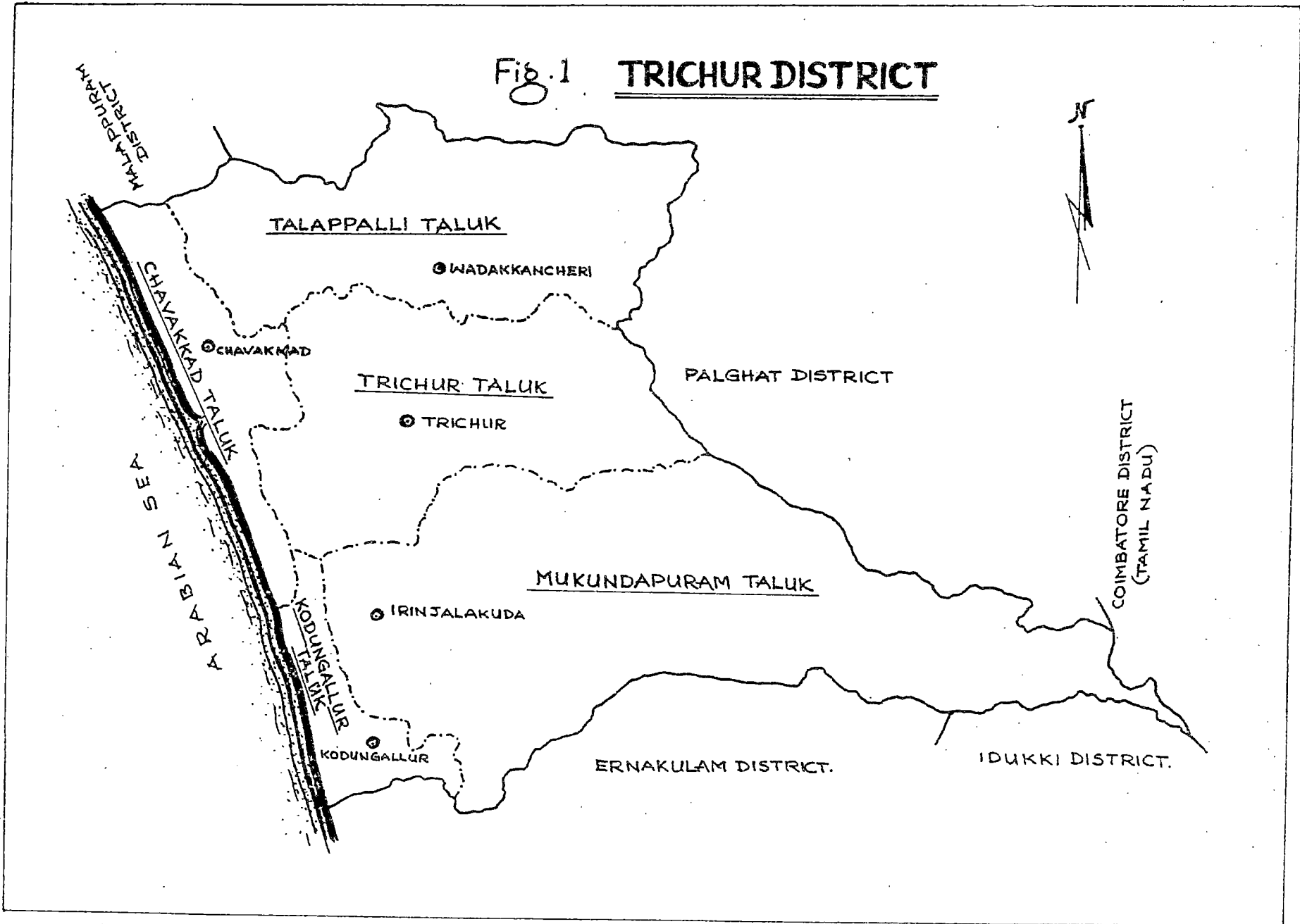
Source Farm Guide, 1982. pp. 10-17

under food crops come to about 70.31 per cent and the rest for non-food crops (29.69 per cent).

Coconut is the predominant perennial crop grown with 53549 hectares (23.39 per cent of the total). Besides, fruit crops like mango, banana and pineapple are grown in an area of 4645, 1380 and 485 hectares respectively.

The areas covered by the study are shown in the map of Trichur district (Fig.1).

Fig.1 TRICHUR DISTRICT



# *Review Of Literature*

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## REVIEW OF LITERATURE

Studies relating to the production and marketing of Pineapple are very limited and hence similar studies on some fruit crops and field crops are included in this chapter. This is divided into three sections.

1. General aspects
2. Studies on production function
3. Marketing and price spread studies

### 1. General aspects

Teaotia and Pandey (1962) made some studies on Pineapple growing and observed that Pineapple has great scope for development and wider cultivation in the country. Increasing the area under Pineapple cultivation could be recommended, but the availability of suitable planting material acts as a hindering factor in this regard. The general practice of raising Pineapple plantation was by vegetative propagation and under Jamaican conditions Topper (1952) recommended Pineapple cultivation by suckers, slips, crowns and segmented stems. Teaotia and Pandey (1962) proposed slip, crown, sucker and green stump as planting material for Giant kew

variety and parent stump, suckers and crown for queen variety in India.

As selection of planting material depends on local conditions and the type of variety to be grown, a study using the variety Giant kew at the fruit research station, Basti, Utter Pradesh was conducted by Teotia and Pandey (1966). It revealed that there was no difference between slips and suckers for flowering, but slips were recommended due to the more vigorous growth of slips. Crowns were to be used only when slips and suckers are not available. Stumps proved to be a total failure.

Singh et al. (1974) mentioned the importance of Pineapple for its canned slices and bottled juice as well as for consumption as fresh fruit. High cost of production, both for fresh fruit and preserved products, had however left this fruit to the reach of the elite only. Recently, Pineapple cultivation assumed greater importance because of high nutritive value and delicious taste, unique flavour and better digestive properties due to enzymatic content 'Bromelin'. It was suggested that improvement in the prevalent agro-techniques of Pineapple cultivation, therefore needs to be taken up in order to make it more remunerative. The plant population per unit area was

found to be one of the most important factors, which is directly related with the total crop yield and lower cost of production.

Ordinarily the first or plant crop of pineapple gave highest yield in Hawaii, but where the method of planting allows for a greatly increased number of fruits in the ratoon crops, the first crop was likely to be small. The highest yields in the world were obtained in Hawaii, where formerly 10 tons per acre was considered satisfactory, but where with improved practices 25 to 30 tons were expected and the maximum was as high as 40 tons in the plant crop. The first ratoon gave 20 to 25 tons and the second much less. Ordinarily the yield in one cycle before replanting would be 50 to 60 tons with 75 tons as the limit. In other countries, average yield was about 10 tons of smooth Cayenne or 6 to 7 tons of queen or other small varieties. On account of the wide spacing used in South Africa, yields of 5 tons of smooth Cayenne and about 2 tons of other varieties were recorded (Hayes, 1970).

Sane (1935) recorded experimental yield in one field in Ceylon for four years, ranging from about 4 to 10 tons, with an average of less than 7 tons per acre. Rao (1946) estimated only 2.4 tons per acre for the entire



country. Naik (1949) estimated 5.5 tons in South India, with as much as 10 tons of the kew variety. Choudhury (1947) reported a yield of 4000 fruits per acre in Assam which was nearly 9 tons. Valuing the fruits at 2 annas each, he calculated an income of Rs.500 per acre and he estimated the cost of production at Rs.310 per acre. Dharieswar (1950) reported an average profit of Rs.343 per acre from growing pineapple as an intercrop in coconuts.

Various levels of spacing were tried in pineapple cultivation in different parts of the world, by several workers, such as Kwang and Chiu (1966) in Taiwan, Nyenhuis (1967) in Natal, and Su (1957) in China. General recommendation for spacing of pineapple in India was at the rate of ten thousand to seventeen thousand plants per hectare against double of this number in other countries.

Chadha et al. (1971) obtained a yield of 87 tons per ha with a population of 43,036 suckers per hectare. Similarly many workers, viz., Allen (1955) in Malaya, Briant and Tidbury (1942), in Zangibar, Cannon (1957) in Queensland, Dodson (1968) in Switzerland, Su (1957), in China and Wang and Chang (1958) in Taiwan had reported yield increase with increased planting

densities. In recent years, Wu (1969) reported as high as 71,757 plant per hectare to be optimum under Malasian conditions.

Cultivation of pineapple as a commercial fruit in India was limited to an area of 12500 ha and canned pineapple slices had a good market in the international trade. India had a potential to exploit this market provided cost of cultivation could be brought down and area under the crop increased (Chadha et al., 1973). The estimated cost of production of pineapple in India was Rs.200 compared to Rs.95 per ton of fruit in Philippines as reported by Indian Institute of foreign trade (1968). This was primarily due to low yields of 12 - 15 tons per ha in India compared to 60 - 70 tons in Philippines. Such low yields were mainly due to conventional system of planting only 15,000 to 20,000 suckers per hectare as against 50,000 to 60,000 suckers in Philippines and Hawaii.

Chadha et al. (1973) laid out a systematic trial at the Indian Institute of Horticultural Research, Hessaraghatta, Bangalore in order to find out the optimum plant density for obtaining maximum yields of good quality fruits. The growth characters, yield, fruit size as well as fruit quality were compared at

six planting densities, viz., 43036, 47849, 53796, 57383, 61480 and 63758 plants per ha. The planting density of 63758 plants per hectare was found to be the best resulting in an estimated yield of 105.78 tons per hectare without crown compared to 66.64 tons obtained with planting density of 43036 plants per hectare. The average fruit weight obtained was 1.86 kg with crown and 1.659 kg, without crown. The sucker and slip production was also maximum in this density with an average 102 suckers and 432 slips per hundred plants.

A trial with 90 x 90 cm, 75 x 75 cm, 60 x 60 cm and 45 x 45 cm plant to plant and row to row planting distance was conducted on giant kew variety of pineapple in Bangalore, by Singh *et al.* (1974). The study revealed that the narrower spacing decreased the plant growth, reduced the fruit weight and circumference, but increased the total yields and they were found to be highly economical also.

Rolf's (1903) found out that generally shading was favourable for pineapple and it produced 25 per cent increased yield under shade. Duggar (1906) pointed out that partial shading was one of the factors favouring improved texture and quality of the produce. Hayes(1957)

suggested that a half-shaded condition might be useful and favourable for successful pineapple culture. Collins (1960) explained that in pineapple, a very low percentage of sunlight would retard the plant growth and result in small fruits of poor quality particularly lacking in sugars. Johnson and Peterson (1974) observed that in pineapple top quality fruits were produced under conditions of abundant sunshine.

## 2. Studies on production function

Production function in the pure mathematical sense is the technical, functional relationship that exists between resource inputs and product outputs. Production function can be defined as a relationship between the inputs of production service per unit of time and output of produce per unit of time.

Heady (1946) fitted an aggregate production function from a random sample of Iowa farmers ascertaining the real estate, labour in months, machinery and equipment, value of livestock and cash operating expenses as direct variables.

Singh and Garg (1971) derived an aggregate farm production function of the Cobb-Douglous type using expenditure on bullock labour in rupees, expenditure on machinery in rupees, area in acres and expenditure

on labour in rupees as the independent variables.

Prabhakaran and Venugopalan (1971) in their study on farm size and resource use relationship of paddy farms in Kerala, classified the farms into three size group and for each size group, the input-output relationship was studied by fitting the Cobb-Douglous type of production function taking three inputs factors, namely land ( $x_1$ ), labour ( $x_2$ ) and manures and fertilizers ( $x_3$ ) and output as return in rupees.

Bhati et al. (1972) fitted the Cobb-Douglous type of production function to examine the allocation efficiency of capital on different inputs like expenditure on high yielding varieties, seeds, fertilizers and irrigation expenditure on human labour, operated area and expenditure on bullock labour.

Rajakutty et al. (1974), Murti et al. (1971) and Singh and Singh (1973), used Cobb-Douglous type of production function in their studies. In their study two sets of production function were set (1) before and after getting the benefits after eliminating price variations (2) between beneficiaries and non-beneficiaries at a particular point of time using a number of variables.

Lavania et al. (1976) derived the Cobb-Douglous type of production function to study the impact of medium

term loans of commercial banks on productivity in agriculture.

Singh et al. (1971) fitted a Cobb-Douglous type of production function using total farm crop returns in rupees as dependent variable and rupees invested on owned irrigation equipment, investment on draft cattle, expenditure on fertilizers and operated area in acres as independent variables.

Nadda et al. (1981) fitted Cobb-Douglous type of production function to have an idea about resource allocation. Using yield in quintals as the dependent variable and seeds and manures in quintals, human labour day, and bullock labour as independent variables. It was found that reallocation of the resources should be considered for increasing the output since these were not utilised efficiently and judiciously.

### 3. Marketing and price spread studies

The expansion of pineapple production beyond the present boundaries appeared to be largely dependent upon the development of larger markets for the processed fruit (Collins, 1960). New markets could be found in those countries where a considerable proportion of the people enjoy a standard of living which permits

them to purchase some food items not considered as necessary, and which are in a price range above some of the essential foods. The continued operation of the present producing areas depended upon a continuing period of prosperity in the countries now providing the markets. New varieties not greatly different from the present major variety would play a part in future production, largely on the basis of more economical production and more uniform year round quality of the canned fruit.

Ghosh (1963) analysed the Indian market structure and concluded that the traditional market structure persisted inspite of the spread of regulated markets. Venkataraman (1964) conducted a study on marketing of grapes in Bangalore South and found that growers could get much higher price by selling the produce direct to the wholesale markets.

Fairis (1964) described that the real impact and structure of marketing could be measured in terms of such variables as prices, cost and volume of output. Miller and King (1964) observed that there was evidence to support the hypothesis that price did play a part in market structure. Kahlon and Sidhu (1965) studied the market price structure of potatoes in Punjab dealing

with the marketing costs, margins and the prices.

Weber (1966) defined market structure by giving the various stages in marketing from agricultural production through processing to consumption.

Gandhi (1967) in a study in Kerala observed that the system of marketing was old and unsystematic and it was not in the interest of the growers.

Sriraman (1970) studied the marketing of tamarind in Tamil Nadu and pointed out that the marketing of tamarind through co-operatives was good from the stand point of producers.

Desai (1979) analysed the dynamics of price-spread components and found that price-spread explains the variation between the prices received by the producers and paid by the consumers and the magnitude of variation represents the cost of marketing, which in turn, determines the producer's share in the consumer's price.

Joshi and Sharma (1979) worked out the retail price-spread of rice in selected States of India.

Sinha et al. (1979) made a study on price-spread of important food grains in two agricultural markets of Bihar and worked out the marketing costs, margins of intermediaries as well as the price spread and producer's



share in consumer's price.

Suryaprakash et al. (1979) in a comparative study of price spread of selected agricultural commodities in Karnataka included crops like arecanut, coconut, copra, cotton and groundnut. The different marketing channels were identified and the margins realised by the various intermediaries estimated.

Pandey et al. (1979) studied the price spread in paddy, potato and wheat and identified the marketing channels and intermediaries. Sain (1979) arrived at the price spread of paddy, wheat and jute in West Bengal. Neog and Barkataky (1979) measured the price spread for rice in Assam and arrived at the relative change in price spread.

Sarma and Rao (1979) estimated the price spread of pulses in Andhra Pradesh. Price spread in groundnut marketing in Uttar Pradesh was worked out by Verma and Nigam (1979) analysing the relationship between arrival and prices of groundnut and estimating the marketing costs and margins.

Chatha and Kaul (1979) made a study into the marketing margins of potato crop. Behaviour of marketing margins and cost of vegetables in Delhi, viz., Brinjal,

cabbage, carrot, cauliflower, green peas and tomato, was analysed by Gupta and Ram (1979). It revealed that the producer received a very low (38 per cent) share in the consumer price whereas the retailer's margin and marketing costs were quite substantial. Transport, packing and labour expenses were the major components of marketing cost. A similar study was made in Bangalore city by Prasad (1979) and price spread and producer's share in the consumer's rupee arrived at. Nandal and Karwasra (1979) estimated onion price spread in Haryana. Malik (1979) made a case study of Himachal's apple and analysed the marketing channels and price spread in perishable commodities.

Suryawanshi and Kapase (1979) studied the economics of production and trading in Roses in Maharashtra and worked out the cost of production, marketing costs and price spread. Singh et al. (1980) studied the economics of production, marketing costs, margins and problems in production and marketing of green chillis in Ghazipur district. The producer's share in the consumer's rupee was also arrived at.

# *Methodology*

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## METHODOLOGY

The present study on the production and marketing of pineapple in Trichur district is based on data collected from a sample of cultivators. The sample was selected irrespective of the size of holding and covering all parts of Trichur district where pineapple is grown either as pure crop or inter-crop. In this chapter, the sampling procedure adopted as well as the method of analysis are explained.

### Sampling procedure

The absence of a reliable sampling frame necessitated the collection of list of pineapple cultivators from different sources. The population size being very small and scattered, it was not possible to stratify it into subgroups and then select randomly. Hence, from the list of cultivators obtained, fifty farmers were selected by simple random sampling.

### Collection of data

The data for the study were collected by personal interview method, based on a structured interview schedule prepared in advance. A specimen of the schedule is given in Appendix-I. The data on

marketing aspects were collected from a few commission agents, wholesalers and retailers. The information collected includes the area under pineapple, itemwise and yearwise cost of cultivation, marketing aspects, prices received and the problems faced by the cultivators. The survey was conducted during March-April, 1982.

#### **Method of analysis**

The percentage analysis, analysis of capital productivity and functional analysis were used for analysing and interpreting the data.

#### **Cost of cultivation**

Cost of cultivation refers to the total expenses incurred in cultivating one hectare of pineapple. Cost of cultivation item-wise, operation-wise and year-wise calculated and their percentage to total were worked out, from first to fourth year of planting. Pineapple starts yielding in the second year and afterwards ratoon crops are taken upto 5-6 years. The returns get stabilised by fourth year, so the costs and returns are estimated only upto fourth year. By fifth year, the returns start declining.

### Cost of production

Cost of production is the cost of producing one quintal of fruits. Since there is no return in the first year, the expenditure for the first year is distributed among three years from second to fourth, in proportion to the yield obtained in each year. For calculating cost of production per quintal, returns from suckers is subtracted from the cost of cultivation in each year.

### Capital productivity analysis

There are various methods to measure the capital productivity (Gittinger, 1976). The four methods used in this study are - (1) Pay-back period (2) Benefit cost ratio (3) Net present worth and (4) Internal rate of return.

#### 1. Pay-back period

The pay-back period is a measure of the length of time from the beginning of a project to the time net benefits return the cost of capital investment.

#### 2. Benefit-cost ratio

The benefit cost ratio is defined as the ratio between the present worth of benefits and that of costs

$$\text{Benefit-cost ratio} = \frac{\text{Present worth of benefits}}{\text{Present worth of costs}}$$

$$\text{Symbolically, B.C. ratio} = \frac{\sum_{t=1}^n \frac{B_t}{(1+I)^t}}{\sum_{t=1}^n \frac{C_t}{(1+I)^t}}$$

#### Net present worth

This is another discounted cash flow measure of project worth. This is defined as the present worth of the cash flow stream. Discounting was done by adopting the following formula.

$$\text{Net present worth (NPW)} = \sum_{t=1}^n \frac{B_t - C_t}{(1+I)^t}$$

$B_t$  = Benefits in  $t^{\text{th}}$  year

$C_t$  = Costs in  $t^{\text{th}}$  year

$n$  = Total number of years of the project

$I$  = Rate of interest (discount rate)

The discount rate used is 12 per cent, being the borrowing rate for short term loans.

#### 4. Internal rate of return

Internal rate of return is that discount rate which makes the net present worth of the cash flow equal

to zero. This represents the average earning power of the money used in the project over the project life.

Symbolically, IRR is that discount rate 'I' such that

$$\sum_{t=1}^n \frac{B_t - C_t}{(1 + I)^t} = 0$$

The value of I is determined by trial and error method.

#### Resource use efficiency

Cobb-Douglous production functions of the form  $y = ax_1^{b_1} x_2^{b_2} x_3^{b_3} x_4^{b_4}$  were fitted based on absolute values of production as well as per hectare values for the main crop. The influence of factors such as land area ( $x_1$ ), human labour ( $x_2$ ), number of suckers ( $x_3$ ) and cost of fertilizer ( $x_4$ ) on total production ( $y$ ) was evaluated using this function. Logarithmically the function is represented as

$$Y = \log a + b_1 \log x_1 + b_2 \log x_2 + b_3 \log x_3 + b_4 \log x_4$$

where,

Y = total output in rupees

$x_1$  = land area in hectares (Pineapple)

$x_2$  = human labour in man equivalent days

$x_3$  = suckers in '000 numbers

$x_4$  = cost of fertilizer in rupees

$b_1, b_2, b_3$  and  $b_4$  are elasticities of inputs.



Using the data on ratoon crops for four years, a similar type of function was fitted with per hectare value of production and resource use efficiency of the various factors estimated.

#### Marketing studies

Price spread for different channels of marketing was analysed by taking the difference between the farm price and the consumer's price. It can be represented as,

$$P_c - P_f = P_s \quad \text{where,}$$

$$P_s = \text{price spread}$$

$$P_f = \text{farm price}$$

$$P_c = \text{consumer's price}$$

The percentage price spread was calculated by using the formula  $\frac{(P_c - P_f)}{P_f} \times 100$  and expressed as percentage relative to the farm price. The components of price spread such as the marketing costs incurred by the various intermediaries as well as the margins obtained by them were also estimated.

## *Results and Discussion*

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## RESULTS AND DISCUSSION

### I. General Economic and Social condition of the sample

In order to obtain some background information about the pineapple cultivators, family details were collected and analysed. Details regarding the size of holding, education, occupation, income etc. of the respondents are given below.

The sample pineapple cultivators were grouped according to the area under pineapple and this size-group classification is given in Table 5.1 along with their percentage to total. The table reveals that 48 per cent of the respondents had an area below one hectare, 32 per cent between one and two hectares and 20 per cent above two hectares. The average area under pineapple for the sample was 1.45 hectares.

Table 5.1 Classification of respondents according to area under pineapple

Below 1 hectare	1-2 hectares	above 2 hectares	Total
24 (48)	16 (32)	10 (20)	50 (100)

\*Figures in paranthesis represent percentages  
of the total

### 1. Size of holding

The average size of holding for the sample selected was found to be 3.23 hectares. Of the total, 42 per cent of the respondents had 2 - 4 hectares of area under cultivation, 32 per cent between 1 - 2 hectares, 12 per cent below one hectare and 14 per cent above 4 hectares, as is evident from Table 5.2.

Table 5.2 Distribution of respondents according to size of operational holding

Holding size Classes	Below 1 hectare	1-2 hectares	2-4 hectares	Above 4 hectares	Total
I	6 (25.00)	7 (29.17)	10 (41.67)	1 (4.17)	24 (100.00)
II	0 (0)	9 (56.25)	7 (43.75)	0 (0)	16 (100.00)
III	0 (0)	0 (0)	4 (40.00)	6 (60.00)	10 (100.00)
Total	6 (12.00)	16 (32.00)	21 (42.00)	7 (14.00)	50 (100.00)

\* Figures in paranthesis show percentages of the total

## 2. Family size

The average size of family for the sample was found to be 6.31. Table 5.3 shows that 14.58 per cent of the total families had only 2-4 members, while 62.50 per cent had 5 to 7 members. The families having 8-10 members were 16.67 per cent and 6.25 per cent had more than 10 members in the family. The distribution of respondents according to family size in the three classes differed much.

## 3. Age

Age-group classification of respondents as given in Table 5.4 reveals that 30.57 per cent of the respondents belonged to the age group of 41-50, 30.00 per cent between 31 and 40, 28.77 per cent between 51-60 and the rest 12.47 per cent above 60 years. The average age for the sample came to be 49.02 years.

## 4. Education

Analysing the educational status of the respondents' family, it was found that only about 1 per cent of the total sample was illiterate. Out of the rest, 7.59 per cent was children in the pre-school age group and 20.79 per cent studied upto primary school, 27.39 per cent upto middle school and

Table 5.3 Distribution of respondents based on family size

Family size Classes	2-4 members	5-7 members	8-10 members	Above 10 members	Total
I	2 (8.70)	15 (65.22)	3 (13.04)	3 (13.04)	23 (100.00)
II	4 (26.67)	8 (53.33)	3 (20.00)	0 (0)	15 (100.00)
III	1 (10.00)	7 (70.00)	2 (20.00)	0 (0)	10 (100.00)
Total	7 (14.58)	30 (62.50)	8 (16.67)	3 (6.25)	48 (100.00)

\* Figures in parentheses represent percentage of the total

Table 5.4 Age-group classification of respondents

Age Classes	31-40 (years)	41-50 (years)	51-60 (years)	Above 60 (years)	Total (years)
I	9 (37.50)	8 (33.33)	4 (16.67)	3 (12.50)	24 (100.00)
II	4 (25.00)	5 (31.25)	6 (37.50)	1 (6.25)	16 (100.00)
III	2 (20.00)	2 (20.00)	4 (40.00)	2 (20.00)	10 (100.00)
Total	15 (30.00)	15 (30.00)	14 (28.00)	6 (12.00)	50 (100.00)

\* Figures in parentheses represent percentage of the total

Table 5.5 Distribution of respondents' family according to education

Level of education	Class-I		Class-II		Class-III		Total	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
1. Below 5	12	7.89	7	7.78	4	6.55	23	7.59
2. Primary School	30	19.74	24	26.67	18	29.51	63	20.79
3. Middle School	35	23.03	28	31.11	20	32.79	83	27.39
4. High School	38	25.00	20	22.22	11	18.03	69	22.77
5. Diploma	20	13.16	12	13.13	5	8.20	39	12.88
6. Graduate	15	9.87	8	8.88	3	4.92	26	8.59
7. Illiterate	2	1.31	1	1.11	0	0	3	0.99
<b>Total</b>	<b>152</b>	<b>100.00</b>	<b>90</b>	<b>100.00</b>	<b>61</b>	<b>100.00</b>	<b>303</b>	<b>100.00</b>

22.77 per cent upto high school. Only 8.59 per cent were able to study in Colleges. The education level among the three size-groups was found to be similar. The distribution of respondents family according to education is given in Table 5.5.

#### 5. Occupation

The distribution of respondents family according to occupation as shown in Table 5.6 reveals that 47.42 per cent of the total was engaged in agriculture alone, 28.49 per cent had business as secondary occupation along with agriculture and 22.09 per cent had government jobs or other similar services. While 29.73 per cent of the respondents in Class-III took up business as subsidiary occupation, only 19.05 per cent in Class I had business.

#### 6. Family income

Of the total respondent families, 25 per cent had income above Rs.25,000 per annum, 33.33 per cent had income between Rs.15,000 and 25,000, 31.25 per cent between Rs.5000 and 15,000 and 10.42 per cent below Rs.5000 per annum. The classification of respondents according to family income is given in Table 5.7. It



Table 5.6 Occupation-wise classification of respondents' family

Occupation Classes	Agriculture alone	Agriculture + business	Agriculture + service	Total
I	40 (47.62)	16 (19.05)	28 (33.33)	84 (100.00)
II	26 (50.98)	14 (27.45)	11 (21.57)	51 (100.00)
III	19 (51.35)	11 (29.73)	7 (18.92)	37 (100.00)
Total	85 (49.42)	49 (28.49)	38 (22.09)	172 (100.00)

\* Figures in parentheses represent percentages of the total.

Table 5.7 Classification of respondents according to family income

Family income Classes	Upto Rs. 5000	Rs. 5000 - 15000	Rs. 15001 - 25000	Above Rs. 25000	Total
I	5 (21.74)	8 (34.78)	6 (26.09)	4 (17.39)	23 (100.00)
II	0 (0)	6 (40.00)	7 (46.67)	2 (13.33)	15 (100.00)
III	0 (0)	1 (10.00)	3 (30.00)	6 (60.00)	10 (100.00)
Total	5 (10.42)	15 (31.25)	16 (33.33)	12 (25.00)	48 (100.00)

\* Figures in parentheses represent percentages of the total.

was found that among the three classes, in Class III 60 per cent of the cultivators had an annual income of above Rs.25,000, while in Class I and II the percentages were 17.39 and 13.33 respectively. For the estimation of annual income, income from all sources was considered.

## II. COST OF CULTIVATION

Pineapple, being a perennial crop taking five to six years to complete its crop cycle, the costs for its cultivation are incurred over this period. Therefore, information was collected on the quantities of various inputs applied by the sample cultivators during the different years from planting till fourth year (this being the terminal year of stable yield), after which most farmers resorted to replanting. The inputs used were tabulated and the per hectare use of the different inputs for various years of cultivation have been worked out. The inputs were valued at actual prices paid in the case of purchased inputs and at the rate, existing in the area during the period of investigation, for others.

Hired and family labour were treated alike and female labour was converted into man equivalent days at the rate of 3 women equal to 2 men. Interest on working capital has also been calculated at the rate of 12 per cent per annum which is the rate charged by Co-operative banks for short-term loans. However, since all the costs are not necessarily incurred at the beginning of the year, but are distributed over the entire year, interest would be over estimated. In order to avoid that, interest on one year's working capital was calculated

for a period of six months. In the case of the first two years which is the pre-bearing stage interest was calculated at 12 per cent per annum for only one year. Rental value of land is not included as all the holdings are owner operated.

The cost for undertaking one hectare of pineapple cultivation and the cost that a farmer would incur at the present cost of inputs for four years is presented. The cost figures for different size holdings classified based on the area under pineapple as size class-I having below 1 hectare area, size class II between 1 and 2 hectares, and size class III above 2 hectares, have been arrived at based on the data collected from sample farmers. Taking the weighted average of these three classes, year-wise and item-wise cost for the district was estimated. The input-wise and operation-wise distribution of the total costs for four years for classes I, II, III and the district have been presented in Tables 5.8 and 5.9 (Fig. 2 and Fig.3).

Examining the break-up of total cost, it is clear that major proportion of expenditure (59.32 per cent) was for human labour followed by fertilizers (24.25 per cent). With regard to the operation-wise distribution

Table 5.8 Input-wise total cost of cultivation per hectare of pineapple for four years (in Rupees)

Sl. No.	Items	Class-I	Class-II	Class-III	District
1	Implements	55 (0.18)	76 (0.26)	85 (0.29)	68 (0.22)
2	Human labour	19187 (61.43)	16939 (57.70)	16738 (56.32)	17929 (59.32)
3	Planting material (Suckers)	2247 (7.19)	1904 (6.48)	1843 (6.20)	2056 (6.78)
4	Fertilisers	6808 (21.80)	7656 (26.08)	8256 (27.78)	7356 (24.25)
5	Growth stimulants	150 (0.48)	165 (0.56)	168 (0.56)	159 (0.52)
6	Taxes	20 (0.06)	20 (0.07)	20 (0.07)	20 (0.07)
7	Interest on working capital	2765.64 (8.86)	2597.04 (8.85)	2610.60 (8.78)	2680.92 (8.84)
	Total	31232.64 (100.00)	29357.04 (100.00)	29720.60 (100.00)	30334.92 (100.00)

\*Figures in parantheses represent percentages of the total

Fig. 2

ITEMWISE TOTAL COST OF CULTIVATION PER HECTARE OF PINEAPPLE FOR FOUR YEARS FOR TRICHUR DISTRICT (IN RS.)

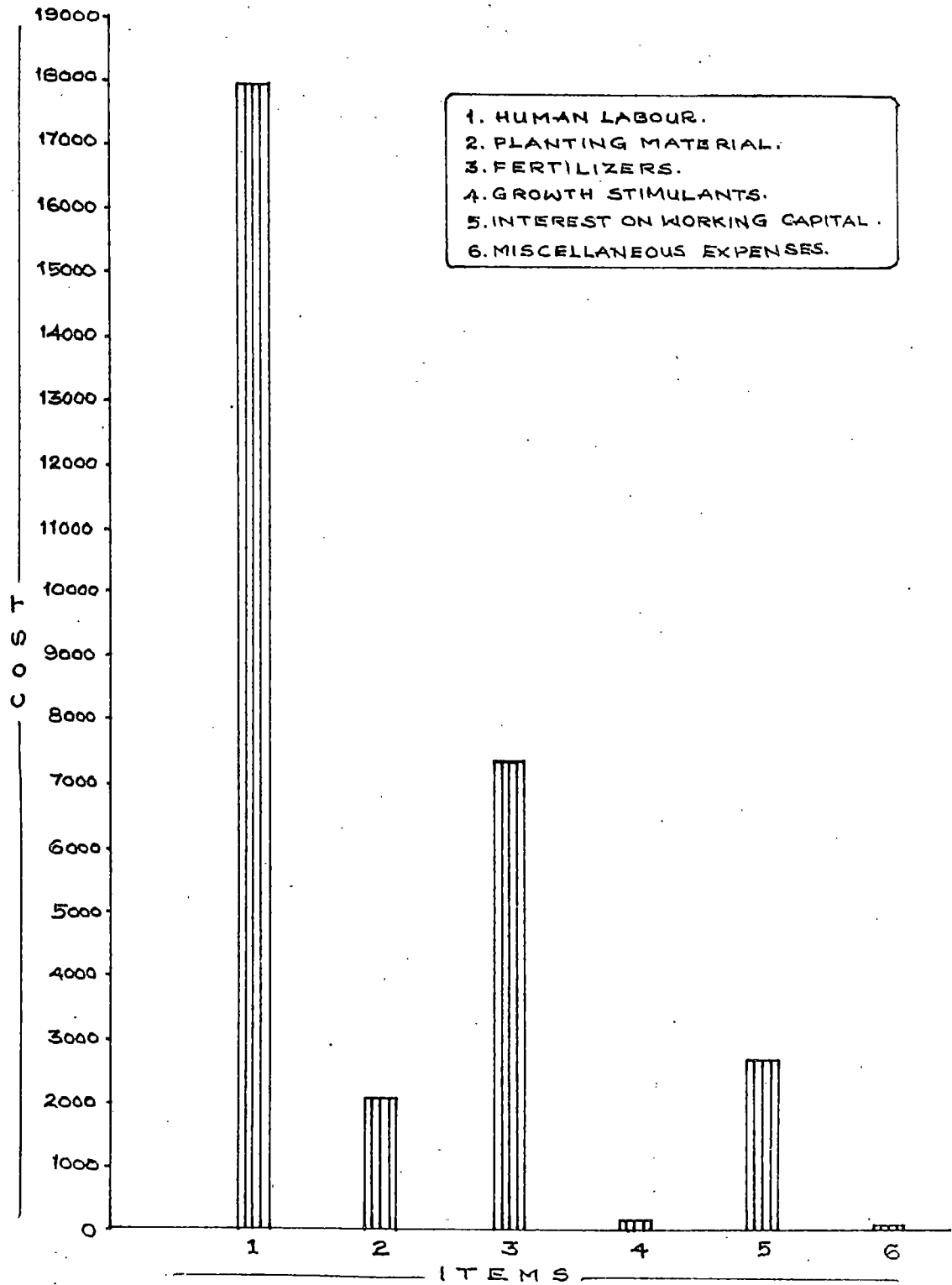


Table 5.9 Operation-wise cost of cultivation per hectare of pineapple for four years (in rupees)

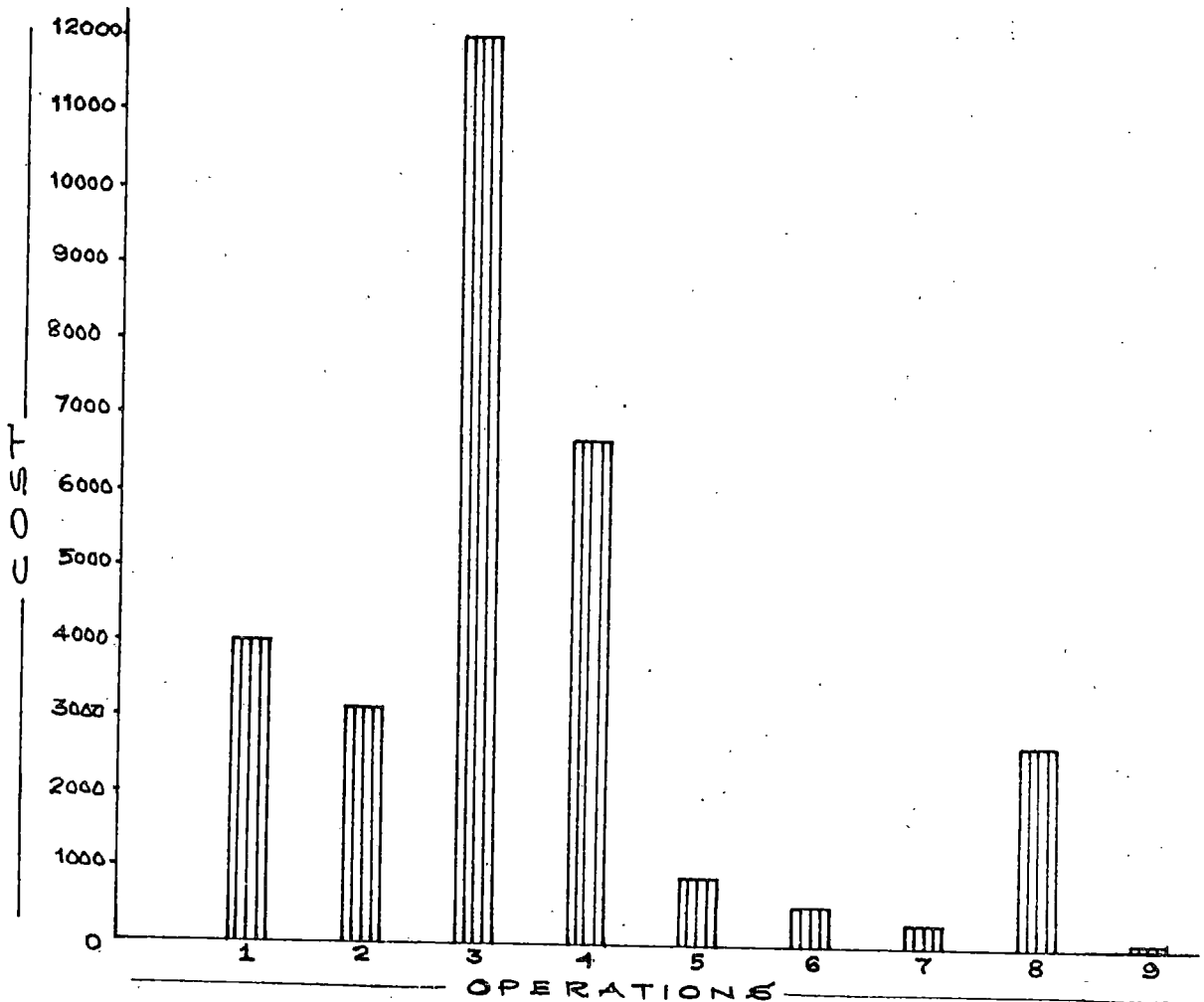
Sl. No.	Operations	Class-I	Class-II	Class-III	District
1	Preparatory cultivation	4169 (13.35)	4029 (13.72)	3591 (12.08)	4009 (13.21)
2	Planting material and planting	3423 (10.96)	2872 (9.78)	2831 (9.53)	3129 (10.31)
3	Manures, manuring and earthing up	11800 (37.78)	11968 (40.78)	12436 (41.84)	11980 (39.48)
4	Weeding	7080 (22.67)	6192 (21.09)	6336 (21.32)	6648 (21.94)
5	Growth stimulants and its application	960 (3.07)	885 (3.01)	924 (3.11)	930 (3.07)
6	Protection of fruits	610 (1.95)	459 (1.56)	567 (1.91)	553 (1.82)
7	Harvesting	350 (1.12)	259 (0.88)	320 (1.08)	315 (1.04)
8	Miscellaneous expenses	75 (0.24)	96 (0.33)	105 (0.35)	88 (0.29)
9	Interest on working capital	2765.64 (8.86)	2597.04 (8.85)	2610.60 (8.78)	2680.92 (8.84)
<b>Total</b>		<b>31232.64 (100.00)</b>	<b>29357.04 (100.00)</b>	<b>29720.60 (100.00)</b>	<b>30334.92 (100.00)</b>

\* Figures in parantheses represent percentages of the total

Fig. 3

OPERATIONWISE TOTAL COST OF CULTIVATION PER HECTARE OF PINEAPPLE FOR FOUR YEARS FOR TRICHUR DISTRICT (IN RS.)

- 1. PREPARATORY CULTIVATION.
- 2. PLANTING.
- 3. MANURING & EARTHING UP.
- 4. WEEDING.
- 5. GROWTH STIMULANTS & ITS APPLICATION
- 6. PROTECTION OF FRUITS.
- 7. HARVESTING.
- 8. INTEREST ON WORKING CAPITAL.
- 9. MISCELLANEOUS EXPENSES.





of costs, manuring and earthing up occupied a major share of the total cost (39.48 per cent), while 21.94 per cent of the cost was incurred for weeding and 13.21 per cent for preparatory cultivation. The above figures are for the district as a whole, and difference in costs were noticed among the three different size groups. The input-wise and operation-wise cost of cultivation for the four years for size classes I, II and III and for the district are given in Appendices IIIa and IIIb.

The total cost of cultivation for size class I came to about Rs.31232.64 per hectare while for class II it was Rs.29357.04 and Rs.29720.60 for class-III. The cost was found to be 6.36 per cent higher for the class I group as compared to class-II, and 5.43 per cent higher than class-III. For the district as a whole the cost was estimated at Rs.30334.92 per hectare based on the weighted arithmetic mean of the three classes.

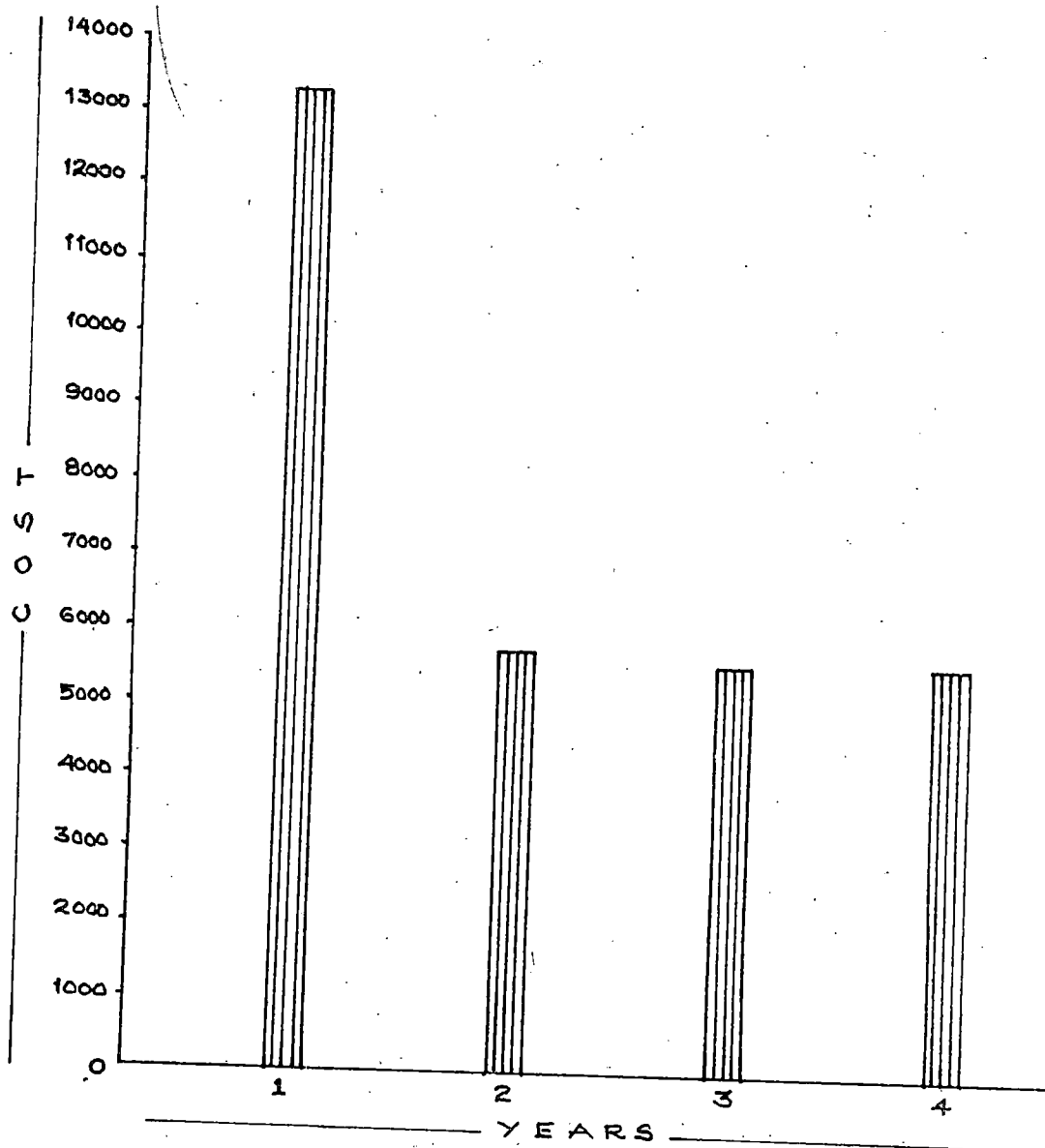
Expenditure was highest during the first year of planting, being 44.37, 43.96, 42.22 and 43.80 percentages to the total for four years respectively for classes I, II, III and the district. The year-wise total cost of cultivation is given in Table 5.10 (Fig.4). The high cost during the first year of cultivation was due to initial preparatory cultivation, cost of planting

Table 5.10 Year-wise cost of cultivation per hectare of pineapple  
(in rupees)

Year	Class-I	Class-II	Class-III	District
1	13856.64 (44.37)	12904.64 (43.96)	12549.60 (42.22)	13289.92 (43.80)
2	5885.60 (18.85)	5602.24 (19.08)	5818.40 (19.58)	5781.44 (19.06)
3	5745.20 (18.39)	5425.08 (18.48)	5676.30 (19.10)	5631.78 (18.57)
4	5745.20 (18.39)	5425.08 (18.48)	5676.30 (19.10)	5631.78 (18.57)
Total	31232.64 (100.00)	29357.04 (100.00)	29720.60 (100.00)	30334.92 (100.00)

\* Figures in parantheses represent percentages of the total

**Fig. 4** YEARWISE COST OF CULTIVATION PER HECTARE OF PINEAPPLE FOR TRICHUR DISTRICT (IN RS.)



materials and planting costs which are absent in the later years.

A comparison of the expenditure for different items reveal that the major item of expenditure was labour cost with 61.43, 57.70, 56.32 and 59.32 percentages of total cost for classes I, II, III and for the district respectively. The year-wise expenditure on human labour and labour utilisation per hectare for the three classes as well as for the district is given in Table 5.11a. Expenditure on human labour was the highest during the first year of the crop due to more use of labour for preparatory cultivation, cleaning the suckers and planting operations in addition to the labour utilized for weeding, manuring and earthing up. From second to fourth year, human labour was utilised for weeding, manuring and earthing up, protection of fruits and harvesting. Labour cost per hectare was found to be more or less uniform for the three classes from second to fourth year, though labour cost for class I was 9.7 per cent higher than class-II, during the first year. Total expenditure on labour for class-I was 13.27 per cent higher than class-II and 14.63 per cent higher than class-III.

The break-up of the labour utilization into hired and family labour in mandays along with their

Table 5.11a Labour utilisation per hectare of pineapple crop

Year	Class-I		Class-II		Class-III		District	
	Mandays	Cost (Rs.)	Mandays	Cost (Rs.)	Mandays	Cost (Rs.)	Mandays	Cost (Rs.)
1	465	8363 (43.59)	448	7623 (45.00)	481	7208 (43.06)	463	7895 (43.87)
2	194	3498 (18.23)	178	3028 (17.88)	205	3070 (18.34)	191	3262 (18.13)
3	204	3663 (19.09)	185	3144 (18.56)	215	3230 (19.30)	200	3420 (19.00)
4	204	3663 (19.09)	185	3144 (18.56)	215	3230 (19.30)	198	3420 (19.00)
Total	1067	19187 (100.00)	996	16939 (100.00)	1116	16738 (100.00)	1052	17997 (100.00)

\* Figures in parantheses represent percentages of the total

Table 5.11b Hired and family labour utilization for pineapple per hectare

Year	Class-I			Class-II			Class-III			District		
	Hired	Family	Total	Hired	Family	Total	Hired	Family	Total	Hired	Family	Total
1	377 (81.08)	88 (18.92)	465 (100.00)	430 (95.98)	18 (4.02)	448 (100.00)	481 (100.00)	-	481 (100.00)	403 (87.04)	60 (12.96)	463 (100.00)
2	155 (79.90)	39 (20.10)	194 (100.00)	164 (12.13)	14 (7.87)	178 (100.00)	205 (100.00)	-	205 (100.00)	162 (84.82)	29 (15.18)	191 (100.00)
3	157 (76.96)	47 (23.04)	204 (100.00)	170 (91.89)	15 (8.11)	185 (100.00)	215 (100.00)	-	215 (100.00)	172 (86.00)	28 (14.00)	200 (100.00)
4	141 (69.12)	63 (30.88)	204 (100.00)	165 (89.19)	20 (10.81)	185 (100.00)	215 (100.00)	-	215 (100.00)	158 (79.80)	40 (20.20)	198 (100.00)

\* Figures in parantheses represent percentages of the total



percentages to total is given in Table 5.11b. It was found that in the category of big cultivators (class III, with area above 2 hectares) family labour was not utilised for pineapple cultivation. Family labour was used more in the case of small cultivators (18.92 per cent) with area below 1 hectare. Only a small percentage (4.02 per cent) of total labour utilized in class-II was contributed by the family members. For the district as a whole, labour contributed by family members came to about 12.96 per cent. The above results point to the fact that in the case of pineapple, the contribution of labour by the members of farmer's family was low.

The cost per hectare for the purchase of suckers during the first year was Rs.2247, 1904, 1843 and 2056 respectively for classes-I, II, III and the district. This included the expenditure on transport of suckers also. The expense for suckers constituted 6.78 per cent of the total cost for the district as a whole.

Expenditure on fertilizer per hectare was Rs.6808 (21.80 per cent), Rs.7656 (26.08 per cent), Rs.8256 (27.78 per cent) and Rs.7356 (24.25 per cent) respectively for classes-I, II, III and for the district. The expense was 12.25 per cent higher for class II than

class-I and 8.32<sup>Percent</sup> higher for class-III when compared to class-I. The fertilizer use was found to be lowest in class-I, as is clear from the above figures.

The cost for implements occurred in the first year of cultivation was Rs.68 for the district and it was found to be entirely used up during the four years. Taxes are incurred as land revenue at the rate of five rupee per hectare every year and it was same for the three classes.

Pineapple comes to bearing in the second year and afterwards ratoon crops are taken. The nature of expenditure as well as returns from second to fourth year are given in Tables 5.12a, 5.12b and 5.12c. The cost of establishment refers to the portion of costs attributed to that particular year from the first year's cost in proportion to the yield obtained in the respective years. It may be observed that the cost of establishment was similar for second and fourth year, but very high for third year. Returns for third year both in terms of quantity and value were more than that for second and fourth year. Returns in the third year came to 44 per cent of the total returns for four years in the district as a whole, while 27.7 per cent of the returns



Table 5.12a Costs and returns for pineapple during the second year of cultivation

Sl. No.	Items	Cost per hectare (Rupees)			
		Class-I	Class-II	Class-III	District
A.	Cost of establishment	3820 (39.35)	3581 (38.99)	3522 (37.71)	3683 (38.92)
B.	Item-wise expenditure for the year				
1.	Human labour	3498 (36.04)	3028 (32.98)	3070 (32.87)	3262 (34.47)
2.	Fertilizers	1702 (17.54)	1914 (20.34)	2064 (22.10)	1842 (19.46)
3.	Growth stimulants	50 (0.52)	55 (0.60)	56 (0.60)	53 (0.56)
4.	Taxes	5 (0.05)	5 (0.05)	5 (0.05)	5 (0.05)
5.	Interest	630.60 (6.50)	600.24 (6.54)	623.40 (6.67)	619.44 (6.54)
	Total	9705.60 (100.00)	9183.24 (100.00)	9340.40 (100.00)	9464.44 (100.00)

## RETURNS PER HECTARE

	Class-I		Class-II		Class-III		District	
	Quantity	Value (Rs.)	Quantity	Value (Rs.)	Quantity	Value (Rs.)	Quantity	Value (Rs.)
1. Fruits (qt)	113.6	10962	106.8	10894	115.4	11367	111.78	11021
2. Suckers Nos.)	5600	627	4907	559	5466	628	5351	605
Total value		11589		11453		11995		11626

\*Figures in parantheses represent percentages of the total

Table 5.12b Costs and returns for the third year of pineapple cultivation

Sl. No.	Items	Cost per hectare (Rupees)			
		Class-I	Class-II	Class-III	District
A.	Cost of establishment	6163 (51.75)	4685 (46.34)	5360 (48.56)	5551 (49.64)
B.	Item-wise expenditure for the year				
1.	Human Labour	3663 (30.76)	3144 (31.10)	3230 (29.27)	3420 (30.57)
2.	Fertilizers	1702 (14.29)	1914 (18.93)	2064 (18.70)	1836 (16.42)
3.	Growth stimulants	50 (0.43)	55 (0.54)	56 (0.51)	53 (0.48)
4.	Taxes	5 (0.04)	5 (0.05)	5 (0.05)	5 (0.05)
5.	Interest	325.20 (2.73)	307.08 (3.04)	321.30 (2.91)	318.78 (2.85)
	Total	11908.20 (100.00)	101110.08 (100.00)	11036.30 (100.00)	11182.78 (100.00)

## RETURNS PER HECTARE

	Class-I		Class-II		Class-III		District	
	Quan- tity	Value (Rs.)	Quan- tity	Value (Rs.)	Quan- tity	Value (Rs.)	Quan- tity	Value (Rs.)
1. Fruits (Qt)	183.23	17682	169.23	17261	175.61	17298	177.43	17478
2. Suckers (Nos)	12800	1433	12550	1430	13567	1560	12873	1456
Total value		19115		18691		18858		18934

\*Figures in parantheses represent percentages of the total

Table 5.12c Costs and returns for the fourth year of pineapple cultivation

Sl. No.	Items	Costs per hectare (Rupees)			
		Class-I	Class-II	Class-III	District
A.	Cost of establishment	3867 (40.23)	3651 (40.23)	3668 (39.25)	3733 (39.86)
B.	Item-wise expenditure for the year				
1.	Human labour	3663 (38.11)	3144 (34.64)	3230 (34.57)	3420 (36.52)
2.	Fertilizers	1702 (17.71)	1914 (21.08)	2064 (22.09)	1836 (19.60)
3.	Growth stimulants	50 (0.52)	55 (0.61)	56 (0.60)	53 (0.57)
4.	Taxes	5 (0.05)	5 (0.05)	5 (0.05)	5 (0.05)
5.	Interest	325.20 (3.38)	307.08 (3.38)	321.30 (3.44)	318.78 (3.40)
	<b>Total</b>	<b>9612.20 (100.00)</b>	<b>9076.08 (100.00)</b>	<b>9344.30 (100.00)</b>	<b>9365.78 (100.00)</b>

RETURNS PER HECTARE

	Class-I		Class-II		Class-III		District	
	Quan- tity	Value (Rs.)	Quan- tity	Value (Rs.)	Quan- tity	Value (Rs.)	Quan- tity	Value (Rs.)
1. Fruits (qt)	115	11098	108.9	11108	120.2	11840	113.4	11251
2. Suckers(Nos)	11484	1274	10411	1186	10632	1222	10970	1225
<b>Total value</b>		<b>12372</b>		<b>12294</b>		<b>13062</b>		<b>12476</b>

\*Figures in parantheses represent percentages of the total

were obtained in second year and 28.2 per cent in the fourth year. Among the different size groups there was not much variation in the quantity and nature of returns.

The costs and returns per hectare of pineapple for a crop cycle (upto 4 years) are given in Table 5.13. In the first year, there was no returns, since the crop comes to bearing only by second year. Maximum yield was obtained in the third year when compared to the returns in second and fourth year. The total returns per hectare in the second year was Rs.11626 for the district. For third and fourth years, the per hectare returns came to Rs.18934 and Rs.12476 respectively. The returns obtained through the sale of suckers at the end of the fourth year was considered as the salvage value. After the fourth year the returns started declining rapidly and farmers resorted to replanting and hence all the studies are made up to the fourth year only.

Table 5.13 Costs and returns of pineapple per hectare for four years  
(in rupees)

Year	COSTS			District
	Class-I	Class-II	Class-III	
1	13856.64	12904.64	12549.60	13289.92
2	5885.60	5602.24	5818.40	5781.44
3	5745.20	5425.08	5676.30	5631.78
4	5745.20	5425.08	5676.30	5631.78

Year	Class-I			Class-II			Class-III			District		
	Fruits	Sucker	Total	Fruits	Sucker	Total	Fruits	Sucker	Total	Fruits	Sucker	Total
1	-	-	-	-	-	-	-	-	-	-	-	-
2	10962	627	11589	10894	559	11453	11367	628	11995	11021	605	11696
3	17682	1433	19115	1726	1430	18691	17298	1560	18858	17478	1456	18934
4	11098	1274	12372	11108	1186	12294	11840	1222	13062	11251	1225	12476
			1200*			1200*			1200*			1200*

\* Salvage value at the end of fourth year

### III. COST OF PRODUCTION

Cost of production of pineapple is the cost incurred in producing one quintal of pineapple fruits. The actual expenditure incurred by the sample cultivators in each class was taken for the computation of costs. The economic life of pineapple is considered as 4 to 5 years, with yield obtaining from second year onwards. After the main crop, ratoon crops are taken for pineapple. The costs incurred in first year has been proportionally allocated among second, third and fourth year, based on the yield obtained in the respective years.

The cost of cultivation per hectare as well as the cost of production per quintal of pineapple fruits from second to fourth year for the three classes and for the district as a whole are given in Table 5.14. Along with the production of fruits, some quantity of suckers was also obtained as by-products. In order to obtain the cost of producing one quintal of fruit, the value of suckers was deducted from the costs in each year.

Cost of production per quintal of pineapple was found to be the highest during the *second* year, being Rs.79.92, 80.75, 75.50 and 79.26 respectively for classes I, II, III and the district as a whole. Cost of production

Table 5.14 Cost of production per quintal of pineapple

Year	Cost of cultivation per hectare (Rupees)				Production per hectare (Quintal)				Cost of production per quintal (Rupees)			
	Class-I	Class II	Class III	District	Class I	Class II	Class III	District	Class I	Class II	Class III	District
2	9078.60	8624.24	8712.40	8859.44	113.60	106.80	115.40	111.78	79.92	80.75	75.50	79.26
3	10475.20	8680.08	9476.30	9726.78	183.23	169.23	175.61	177.43	57.17	51.29	53.96	54.82
4	8338.20	7890.08	8122.30	8139.78	115.00	108.90	120.20	113.40	72.51	72.45	67.57	71.78

was the lowest in the third year with Rs.57.17, 51.29, 53.96 and 54.82 respectively for classes I, II, III and the district. The above results could be attributed to the fact that production was highest for the second crop (third year). For the fourth year, the cost of production per quintal of pineapple came to Rs.72.51, 72.45, 67.57 and 71.78 respectively for classes I, II, III and for the district. Marked variation in the cost of production was noticed during the three different years. From second year to third year, cost of production had declined, but it increased during the fourth year. The variation in the cost of production was not significant among the different size groups.



#### IV. CAPITAL PRODUCTIVITY ANALYSIS

Pineapple being a perennial crop, and the investments and returns on the crop being made over four years (here only four years are considered), it becomes necessary to test the worthiness of investments over this long period. Considering the change in cost of inputs and the inflationary trend, measuring productivity to capital becomes inevitable. Capital productivity analysis bring out a measure of the efficiency of returns obtained over a period of time. The following four measures of capital productivity are estimated for this study.

1. Pay-back period
2. Benefit-cost ratio
3. Net present worth and
4. Internal rate of return

##### 1. Pay-back period

Pay-back period is an undiscounted measure of the worthiness of an endeavour. It measures the efficiency of cultivation by indicating the period within which the returns effect the investments.

The pay-back period for the three classes and the district are shown below.

Class -I	=	2.77 years
Class-II	=	2.78 years
Class-III	=	2.77 years
District	=	2.77 years

The above results indicate that the three classes as well as the district are more or less similar with regard to the pay back period. The computation of pay-back period is given in Appendix-III. The two drawbacks attributed to this measure are -- (1) it fails to consider earnings after the pay-back period, (2) it fails to take into consideration differences in the timing of proceeds.

The other three methods, viz., benefit cost ratio, net present worth and internal rate of return are discounted measures of investment worth. Using a suitable discount rate, the investment is reduced to the present value but the first year's cost is not discounted. The returns are also similarly discounted. The discount rate used for the present analysis is 12 per cent which is the borrowing rate for short term loans. The stream of costs and benefits are then compared.

## VI. MARKETING OF PINEAPPLE

Agricultural marketing is a process which starts with a decision to produce a saleable farm commodity and it involves all aspects of market structure or system, both functional and institutional, based on technical and economic considerations and includes pre and post-harvest operations, assembly, grading, storage, transportation and distribution. Increased production resulting in greater percentage increase in marketed surplus accompanied by the increase in demand from urban population calls for a rapid improvement in the existing marketing system.

An attempt is made in this study to identify the market intermediaries and channels, as also to estimate the marketing efficiency for pineapple.

### Pineapple marketing system

The disposal of pineapple fruits by the sample cultivators was found to be in three ways -- (1) the cultivators had the practice of bringing the produce in vans, lorries or other vehicles to Trichur market and selling it through commission agents to traders, who take their commission as a percentage of the price

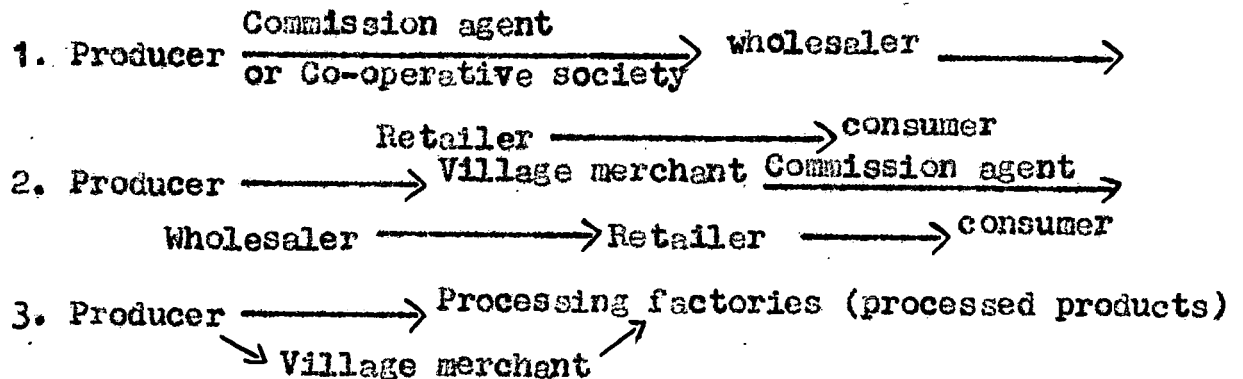
obtained; (2) village traders purchase the produce from cultivators and then brought it to the market; (3) some cultivators sold their produce to industrial units directly also.

The usual system of marketing of pineapple in Trichur known as "taragu", was through commission agents and sold to the traders by the producers. In case of small quantities of the produce, which had to be transported over long distances, the producers sold it to Village merchants who in turn sold it to the traders.

#### Marketing channels

Marketing channel for a produce is the route through which the produce passes, as it move from the producer to the final consumer. The channel involves a number of market intermediaries.

There are only three channels for pineapple marketing in Trichur district, as shown below.



The distribution of cultivators according to the marketing channel is given in Table 5.18. In class-I having an area of below 1 hectare, 58.33 per cent of the cultivators marketed through channel-I, 37.50 per cent through channel-II and only 4.17 per cent through the third channel. In class II, the percentages were 81.25, 12.50 and 6.25 for channel-I, II and III respectively.

Table 5.18 Distribution of cultivators based on marketing channel

Classes	I	II	III	District
<b>Channels</b>				
I	14 (58.33)	13 (81.25)	10 (100.00)	37 (74.00)
II	9 (37.50)	2 (12.50)	-	11 (22.00)
III	1 (4.17)	1 (6.25)	-	2 (4.00)
<b>Total</b>	24 (100.00)	16 (100.00)	10 (100.00)	50 (100.00)

\*Figures in parentheses represent percentages to total  
All the sample cultivators in class-III, having an area of above 2 hectares marketed their produce through the

first channel. For the district as a whole, 74 per cent of the sample cultivators marketed their produce through the first channel, 22 per cent through channel-II and only 4 per cent through the third channel. The above data showed that the second channel including village merchants in the chain of intermediaries was common among small cultivators, and among big cultivators this particular channel was not at all preferred. The fruit and vegetable marketing co-operative society at Trichur was found to act as commission agent and a few of the producers marketed their produce through this society.

#### **Marketing functions and functionaries**

In the case of pineapple, marketing functions are few, if the produce is sold as fresh fruit. After harvesting the fruits, it is taken to the market in van, car, autorickshaw or bullock cart. The producers themselves took the produce to the markets and sold to wholesalers through commission agents. In very few cases, the village merchants purchased the fruits from different producers and then took it to the market. Transportation costs differ depending on the distance to market. On an average it came to about Rs.3 per quintal

of the produce per kilometer. Besides, the loading and unloading charges came to about Rs.4 and Rs.3 per quintal respectively.

Since pineapple is a perishable commodity, the fresh fruits are not stored usually for future sales. Lack of proper storage facilities appeared to be the reason for this.

Pineapple marketing involves a number of intermediaries such as village merchants, commission agents, wholesalers and retailers. These different intermediaries perform a lot of services. In case of small cultivators, transporting of the produce to the market becomes a problem and hence the village merchants are doing them the service of taking their produce to the market, though a margin of the profit is taken by them.

There are about seven commission agents in Trichur market including one co-operative society. In addition to pineapple, they deal with apples, oranges, grapes and mangoes. The fruit and vegetable marketing society alone handles as much as 250 MT of pineapple fruits per annum and the commission charges are somewhat

low (6 per cent) when compared to other commission agents. Because of the lack of bargaining power, the producers are not able to get a proper price for their produce even if they bring it to market. The commission agents help them to get the maximum possible price from the wholesalers and retailers and a percentage of the value of the produce has to be given as commission. It was found to be about 8-10 per cent. A number of wholesalers and retailers are there who deals in fruits like apple, grapes, oranges, pineapple, mango and banana.

#### **Marketing efficiency**

An efficient marketing system is one of the essential requirements for enhancing agricultural productivity which encourages the farmers by giving them fair returns for their produce. The economic efficiency of a market can be measured in terms of the price spread and marketing costs, temporal price differences and storage costs and the degree of market integration. In the present study, efficiency is assessed on the basis of price-spread and marketing costs.

The price spread refers to the differences between the price paid by the consumer and the price



received by the producer for an equivalent quantity of farm product. This spread consists of marketing costs and margins of the intermediaries which ultimately determines the overall effectiveness of a marketing system. If the goods could be moved from the producer to the ultimate consumer at least possible cost consistent with the provision of services the consumer desires, the marketing system is efficient. Reduction in the cost of performance of various marketing functions and improving the standard of service with the same or lower costs represent clear case of marketing efficiency. At the same time, the provision of additional marketing services that may raise the cost of marketing also represents greater efficiency if the consumers value them more than the corresponding saving in cost. If the services provided are same, then the marketing system or agency that provides these services with the minimum of costs is the more efficient (Sidhu and Rangji, 1979).

Price spread can be worked out by either "concurrent margins" method or "lagged margins" method. Concurrent margins refer to the difference between the prices prevailing at successive stages of marketing on the same date, while lagged margins is the difference

between the price of farm produce obtainable at a particular stage of marketing and the price paid for it at the preceding stage of marketing during an earlier period, the length of time between the two dates being the average period for which the marketing agency holds the product. Concurrent margins do not take into account the time that elapses between purchases and sale of the produce by the same party either due to stock holding or processing for price consideration. Lagged margins take into account the time that elapses between purchase and sale by a party and for that matter between sale by the farmer and purchase by the consumer and this allows for the choice of time which the trader exercises while carrying out his business. The approach generally adopted in the lagged margin method is selecting specific lots and tracing them back to the source of origin (Sinha et al., 1979).

The method of concurrent margins was used in the present study. The costs and profits of the various intermediaries as well as the price per quintal of pineapple in Trichur market is given in Tables 5.19a, and 5.19b. The producer's share in the consumer's price was found to be 51.79 per cent (Rs.101 out of Rs.195).

Table 5.19a Marketing costs and margins for pineapple

Sl. No.	Marketing channel - Intermediaries	Price/cost ₱/qt.	Percentage	
I	Producer's sale price	101 <sup>300</sup>	51.79	50
II	Commission agent/ Co-operative society Commission	8 <sup>24</sup>	4.10	4
III	Wholesaler			
	a) Purchase price	101 <sup>300</sup>	51.79	50
	b) Costs	10.50 <sup>30</sup>	5.38	5
	c) Margins	170 <sup>34.50</sup>	17.69	28.5
	d) Sale price	146 <sup>500</sup>	74.87	80
IV	Retailer			
	a) Purchase price	146 <sup>500</sup>	74.87	80
	b) Costs	8.25 <sup>24</sup>	4.23	4
	c) Margins	40.75 <sup>76</sup>	20.77	27.6
	d) Sale price	195 <sup>600</sup>	100.00	100
V	Consumer's purchase price	195 <sup>600</sup>	100.00	100

Table 5.19b    Producer's share in the consumer's price for pineapple

Sl. No.	Intermediaries	Amount Rs./Qt.	Percentage
1	Producer's share	101	51.79
2	Wholesaler's margin	34.50	17.69
3	Retailers margin	40.75	20.90
4	Cost of marketing	18.75	9.62
5	Consumer's price	195	100.00

The wholesalers got a margin of 17.69 per cent (Rs.34.50) while for retailers it was 20.77 per cent (Rs.40.75). The marketing costs as incurred by the wholesalers and retailers included transportation, loading, unloading and rent for buildings. For wholesalers the costs came to about Rs.10.50 per quintal (5.38 per cent) and for retailers it was Rs.8.25 per quintal (4.23 per cent).

#### Price spread

The price spread for pineapple was calculated using the formula,  $P_S = P_2 - P_0 = P_0 (xy - 1)$  where,

$P_S$  = Price spread  
 $P_0$  = Producer's price  
 $P_1$  = Wholesaler's price  
 $P_2$  = Retailer's price

$$x = \frac{P_1}{P_0} = 1.446$$

$$y = \frac{P_2}{P_1} = 1.336$$

The spread between the producer's and consumer's price came to Rs.94. The percentage price spread as obtained by the formula,  $\frac{P_S}{P_0} \times 100$  was 93.07.

The producers and consumers price as well as the price spread is given below.

Producer's price ( $P_0$ ) = Rs.101 per quintal  
 Consumer's price ( $P_2$ ) = Rs.195 per quintal  
 Price spread ( $P_S$ ) = Rs. 94 per quintal  
 Percentage price spread = 93.07

The above data indicate a very high price-spread on account of high marketing costs and the margins realised by various intermediaries at different stages of marketing. This is an indication of inefficiency of marketing and hence measures to increase marketing efficiency through lowering the price-spread is necessary. This lowering of price-spread is possible only by reduction in marketing costs and margins, and reducing the number of intermediaries.

#### Processing of pineapple

A number of products are made from pineapple such as slice, juice, titbit, squash, syrup and jam.

#### Slices

Medium sized fresh fruits without any type of bacterial or other types of spoilage is selected and inedible portions are removed. They are then washed

thoroughly in water and the outerskin is removed by manual labour. The peeled fruit is then sliced in a slicer. The thickness of the slices will usually be 1.3 cm. The sliced fruit is sorted according to the size of the cans in which they are to be canned. Generally A2½, A1 Tall and A2 cans are employed in canning pineapple slices. Each slice is punched by using punches of suitable sizes and the centre cone is removed by cone punches. The eyes are then removed and the prepared fruit is then filled in sterilized cans on weight basis. A percentage drained weight of 50 should be maintained on the basis of the net weight of the can. Hot sugar solution containing 35 to 40 per cent sugar and 0.2 to 0.3 per cent acidity as citric acid at a temperature of about 80 to 90°C is used for covering the slices in the can. The cans are then allowed to pass through an exhaust bore to create vacuum in the can. When the center of the can after exhausting reaches a temperature of 175 to 180°F, they are immediately sealed hermetically by using a double scanner to prevent the loss of vacuum. The sealed cans are processed in boiling water (212°F) for a predetermined time. The time varies according to the size of the can. Generally A 2½ can of 850 gm net weight is processed at 212°F for 25 to 30 minutes. After

processing, the cans are cooled immediately to avoid over cooking to a can body temperature of about 100°F. The cooked cans are then wiped and coated with a thin coat of oil to prevent corrosion due to oxygen and stored in a cool dry place.

#### Titbits

The procedure is same as above except in the cutting, and it is considered of low quality compared to slices.

#### Juice

Pineapple fruits are made into a pulp, and squeezed. After boiling the pulp, sugar is added, to get pineapple juice.

#### Squash

After taking the pineapple juice as mentioned above, it is made into syrup. Colour, essence and preservatives are added to prepare pineapple squash.

#### Jam

The pulped pineapple fruit is mixed with sugar, boiled and thickened. The chemical pectin is added for thickening. Adding essence, preservatives etc., pineapple jam is obtained.



There are five main canning units in Trichur - Calico, Darlco, Pio food Packers, Pico Industries and Canning Company and Sudha Fruit Products. Out of this, Sudha Fruit Products is operated in the Co-operative sector, as a unit of the Fruit and Vegetable Marketing Society, Trichur.

The pineapple fruits for the above factories are brought from Cannanore and Idukki districts. The producers of pineapple in Trichur district do not sell their produce directly to processing factories, as the price obtained from them is rather low, when compared to the market price.

## VII. PRODUCTION AND MARKETING PROBLEMS OF PINEAPPLE CULTIVATORS

Pineapple cultivators are faced with several problems in production and marketing. Land ceiling had forced big cultivators to part with their pineapple lands or convert them for cultivation of other crops. Large scale cultivation of pineapple would be impossible if ceilings are fixed for crops like pineapple. As production depends on area under cultivation, it is essential that area is not allowed to reduce.

High cost of labour as well as the scarcity of labour was pointed out as a major problem experienced by the pineapple cultivators in Trichur. Besides, other inputs like fertilisers, growth stimulants etc. could not be used to the extent recommended due to their high cost and high application charges.

With regard to the method of cultivation followed by the sample cultivators, it was found that most of them were growing the crop in a compact area and for many years continuously though replanting was done once in 5 to 6 years. All the cultivators were using improved varieties of planting material. The recommended spacing for the crop is very close and hence difficulties

were experienced for cultural operations such as manuring and earthing up, weeding, protection of fruits and harvesting. The cultivators, therefore, were found to prefer a wider spacing.

The occurrence of pests and diseases was rare in the study area and so plant protection measures were not necessary. Though all the cultivators interviewed were aware of the hormonal stimulants that are recommended for controlling flowering in pineapple, they were doubtful as to the effectiveness of it. It had not gained popularity and they fear that though number of fruits increases, there is much reduction in size of fruits as also decrease in fruit quality.

The cultivators found it difficult to sell their produce at the desired price due to the absence of proper marketing facilities. The fruits had to be taken over long distances to the Trichur market and hence problems in transportation and storage was experienced. Pineapple being perishable has to be disposed off soon after harvest and lack of proper storage facilities in the market makes it difficult for the cultivators. Moreover, wide fluctuation-both day to day and seasonal- in price of fruits was noticed in the market.

There is a co-operative society in Trichur for the marketing of fruits and vegetables, in which most of the pineapple cultivators are members. This society has a factory of its own (M/s.Sudha Products). But this factory is finding it difficult to compete with other industrial concerns as it started activities only a couple of years ago. Substantial government assistance in the form of loan and subsidy would help to improve the condition of the factory and thereby ease the problem of the cultivators.

Nonavailability of sufficient quantity of pineapple fruits was <sup>a</sup> general problem faced by the canning factories of the district. Lack of sufficient production in the district necessitated the factories to depend on fruits from outside the district. High cost of tin was also pointed out as another difficulty standing in the way of production of processed fruits.

#### Suggestions for improvement.

Some attempts should be made to popularise the use of hormones which will help in adjusting the season of harvesting, thereby ensuring a better price for the fruits. Care should be taken while spraying growth

stimulants to plants. Spray only to plants having good growth and vigour. If sprayed to weak plants, wilting of plants will be resulted. Spraying should be done during the period of August-September.

Improvements in transportation and storage facilities are necessary for solving the marketing problems of the cultivators. By encouraging the cultivators to take up more and more of pineapple cultivation, it would be possible to increase the production in this district and thus enabling the supply of fruits to the canning centres.

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Summary

### SUMMARY

The present study on the "Production and Marketing of Pineapple in Trichur District" was conducted with the following objectives in view.

(1) To find out the costs and returns, and (2) marketing costs and price spread for pineapple in Trichur district. This study is based on primary data collected from a sample of 50 pineapple growers selected by simple random sampling and from a few market intermediaries. The data for the study was collected during March-April, 1982.

It was found that almost all the sample cultivators were literate and had more than one occupation. Only 47.42 per cent of the respondents was engaged solely in agriculture. The average size of family was 6 and 63 per cent of the sample farmers had 5 to 7 members in their family. The average size of holding for the sample selected was 3.23 hectares with 42 per cent of the respondents having area between 2 to 4 hectares. The respondents were grouped into three size groups based on their area under pineapple with size class-I having area below 1 hectare, class-II between 1 and 2 hectares and class-III above 2 hectares.

Cost of cultivation per hectare of pineapple for four years was estimated year-wise, item-wise and operation-wise based on 1981 prices. The total cost of cultivation per hectare for four years was found to be Rs.31232.64, 29357.04, 29720.60 and 30334.92 respectively for classes I, II, III and the district. Among the four years, cost of cultivation was highest in the first year being Rs.13289.92 (42.55 per cent) for the district.

The major item of expenditure was human labour constituting about 61.43 per cent (Rs.19187), 57.70 per cent (Rs.16939), 56.32 per cent (Rs.16738) and 59.32 per cent (Rs.17995) for classes-I, II, III and the district respectively. Expenditure on fertiliser accounted for 24.25 per cent (Rs.7356) for the district. The cost incurred for the purchase of suckers during the first year was Rs.2056 (6.78 per cent).

With regard to the operation-wise cost of cultivation, manuring and earthing up occupied a major share of the total cost being 37.78 per cent (Rs.11800), 40.78 per cent (Rs.11968), 41.84 per cent (Rs.12436), and 39.48 per cent (Rs.11976) respectively for classes-I, II, III and the district. The expenditure for weeding was found to be 24.04 per cent (Rs.6656) of the total cost.



Pineapple starts yielding in the second year and costs and returns from second to fourth year was estimated. Returns for the second year was found to be Rs.11626 with fruit yield of 111.78 quintals per hectare, for the district. Maximum yield was obtained in the third year with 177.43 quintals of fruits per hectare accounting a return of Rs.18934. In the fourth year the returns came to Rs.12476 with 113.4 quintals of fruit yield per hectare.

Cost of production per quintal of pineapple fruits was highest in the second year with Rs.79.92 for class-I, Rs.80.75 for class-II, Rs.75.50 for class-III. The average for the district was Rs.79.26. In the third year cost of production was lowest with Rs.57.17, 51.29, 53.96 and 54.82 respectively for classes-I, II, III and the district.

The pay-back period for the district was 2.77 years with a benefit cost ratio of 1.31 and net present worth of Rs.8258.09. The internal rate of return came to 43.37 per cent. The benefit cost ratio, net present worth as well as internal rate of return were highest for class-III having an area of more than 2 hectares, followed by class-II with an area between 1 and 2 hectares and lastly class-I having area below 1 hectare.

Resource use efficiency was studied using the Cobb-Douglous production function. The marginal value of productivity for the factor, number of suckers, was very high indicating that only this factor had significant influence on yield and so as number of suckers per hectare increases there is increased returns.

Marketing of pineapple was found to be through three channels in Trichur and the producer  $\xrightarrow{\text{Commission agent}}$  wholesaler  $\xrightarrow{\hspace{2cm}}$  Retailer  $\xrightarrow{\hspace{2cm}}$  consumer channel was the most common one and 74 per cent of the respondents marketed through this channel. Pineapple marketing involved a number of intermediaries such as village merchants, commission agents, wholesalers and retailers, each of whom do some service and take some margin of profits.

The marketing efficiency in the case of pineapple was assessed on the basis of price spread and marketing costs. The producer's share in the consumer's price was 51.79 percentage. The commission paid to the commission agents contributed about 4.10 per cent, while wholesalers and retailers took 17.69 per cent and 20.77 per cent margins respectively. The price spread as

calculated based on the difference between producer's and consumer's price was found to be Rs.94. The study of price spread indicated inefficiency, in the marketing of pineapple.

Pineapple cultivators are faced with several problem in production and marketing such as high labour charges, high cost of inputs, high fluctuation in price and absence of proper marketing facilities. In the case of canning centres, the problems with respect to non-availability of sufficient fruits as well as high cost of tins are experienced. So as to improve the condition of the pineapple industry, marketing facilities are to be improved and operated in co-operative sector.

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\*Originals not seen

# Appendices

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## Appendix I

### QUESTIONNAIRE FOR DATA COLLECTION PRODUCTION AND MARKETING OF PINEAPPLE IN TRICHUR DISTRICT

#### BASIC INFORMATION

1. Name and address of Producer:

Village: Block:  
Taluk : Ela:

2. Distance to nearest market:

3. Total area owned by the Producer:

4. Total area cultivated:

5. Family details

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Sl. No.	Name	Age	Sex	Relation-ship with head of household	Edu-cation	Occupation		Income	
						Main	Subsi- Main Sub diary	Main	Sub

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6. Area under pineapple:

	<u>Crop</u>	<u>Area</u>
a. Pure crop		
b. Intercrop		

7. Number of fragments:

<u>Fragment No.</u>	<u>Area</u>
---------------------	-------------

8. Area under other crops:

<u>Crop</u>	<u>Area</u>
A. Seasonal crops	

Area

1. Paddy
2. Pulses
3. Others

B. Annual crops

1. Banana
2. Tapioca
3. Others

C. Perennial crops

1. Coconut
2. Arecanut
3. Fruit trees
4. Others

9. Variety cultivated:

10. Planting material used:

- |          |            |
|----------|------------|
| a. Crown | b. Suckers |
| c. Slips | d. Others  |

11. Source of irrigation:

<u>Source</u>	<u>Area</u>
1. Canals	
2. Tanks	
3. Wells	
4. Others	

12. Source of finance for pineapple cultivation

<u>Source</u>	<u>Security</u>	<u>Amount</u>	<u>Purpose</u>
1. Self-finance			
2. Money lenders			
3. Commercial Banks			
4. Co-operative society			
5. Others			

13. Are you a member of Co-operative Society? Yes/No  
If yes, name of the society:

14. Fixed costs:

1. Implements and machineries:

<u>Sl.No.</u>	<u>Item</u>	<u>No.</u>	<u>Maintenance costs (fuel charge, repairs)</u>
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1. Sprayers
2. Pumpsets
3. Ploughs
4. Tractors
5. Tillers
6. Mammotties
7. Crowbar
8. Others

2. Temporary deadstock

<u>Item</u>	<u>No.</u>	<u>Cost</u>
-------------	------------	-------------

3. Taxes:

- a. Land Revenue
- b. Water tax
- c. Panchayat tax
- d. Income tax
- e. Others (specify)

**COST OF CULTIVATION OF PINEAPPLE (PURE CROP)**

Area:  
Variety used:

Planting material used:  
Time of planting :  
Time of Harvest :

Operation	Animal labour		Human labour				Total cost of labour	Inputs		Total cost				
	No.	Rs.	Men		Women			Qty.	Cost					
			Hired	Family	Hired	Family								
			No. Rs.	No. Rs.	No. Rs.	No. Rs.								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

**I Year**

**I. Preparatory cultivation**

1. Clearing the land
2. Ploughing/Digging
3. Levelling
4. Preparing trenches of suitable size

**II. Planting material and planting:**

1. Selection of suckers
2. Drying and curing of suckers
3. Treatment of suckers
4. Cost of chemicals for treatment (specify chemical used)
5. Cost of suckers
6. Planting of suckers adopted proper spacing



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
III. Manures and fertilizers														
	1. Cost of organic manure													
	2. Application of organic manure													
	3. Cost of fertilizers													
	1st dose (basal)													
	Types													
	a.													
	b.													
	c.													
	2. Application charges													
	6. 3rd dose of fertilizers													
	1. Cost of fertilizers													
	a.													
	b.													
	c.													
	2. Application charges													
IV. After cultivation:														
	1. Weeding (Manual)													
	2. If herbicides used:													
	a. Cost of herbicides													
	b. Application charges													
V. Plant protection:														
	1. Cost of chemicals (specify chemical)													
	2. Application charges													
	3. Hire charges of equipment, if any.													
VI. Miscellaneous:														
	Expenditure													
	Total for 1st year													

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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**II Year**

**I. Maintenance**

1. Digging interspaces
2. Weeding - manual
3. If herbicides used
  - a. cost of herbicides
  - b. application charges
4. Irrigation charges

**II. Manures and fertilizers:**

4th dose

- Types
- a.
  - b.
  - c.

**III. Plant protection**

1. Cost of chemicals
2. Application charges
3. Hire charges of equipment, if any.

**IV. Growth stimulants:**

1. Quantity and types of growth stimulants/hormones used
  2. Spraying charges
-

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----

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V. Protection of fruits

1. Wrapping the fruits with leaves
2. Other methods, if any.

VI. Harvesting and handling

1. Harvesting charges
2. Transportation
  - a. Mode of transport
  - b. Distance to market
  - c. Packing, if any.

VII. Miscellaneous

Expenses:

Total for II Year

GRAND TOTAL

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VII. Yield and income:

1. Total yield of fruit
2. Price received per unit
3. Income
4. Income through sale of slips/sucker/crowns
5. Price per unit
6. Total income

Summary of cost of cultivation

- 1st year
1. Preparatory cultivation
  2. Planting material and planting
  3. Manures and fertilizers
  4. After cultivation
  5. Plant protection
  6. Miscellaneous expenditure
- Total for 1st year

- 2nd year
1. Maintenance
  2. Manures and fertilizers
  3. Plant protection
  4. Growth stimulants
  5. Protection of fruits
  6. Harvesting and handling
  7. Miscellaneous expenses
- Total for 2nd year

GRAND TOTAL

Profit and loss statement

1. Gross income
2. Total expenditure
3. Net profit/Loss

## PROBLEMS OF PINEAPPLE CULTIVATORS

1. Whether growing in a compact area or fragmented.  
If fragmented how many fragments.
2. Previous crop grown in the area.
3. Whether permanent labour employed throughout the year Yes/No
4. Whether planting material is of improved variety. If no reasons. Yes/No
5. Are you adopting correct spacing (If no reasons) Yes/No
6. Are you applying fertilizers according to recommendation. If no, reasons Yes/No
7. Are you adopting recommended plant protection measures. If no, reasons Yes/No
8. Are you adopting soil conservation measures.  
Type of soil conservation measure used. If no, reasons Yes/No
9. Are you doing regular weeding cultural practices.  
If no, reasons Yes/No
10. Whether adequate finance is obtained Yes/No
  - a. If yes, source of finance
  - b. If no, reasons
11. Are you using hormonal stimulants and other chemicals for spraying for controlling flowering Yes/No
12. Are you aware of these hormones/chemicals Yes/No
13. Any other problems

## MARKETING ASPECTS - PRODUCER LEVEL

1. Total quantity produced
2. Quantity spoiled during
  - a. Handling
  - b. Transport
3. Quantity used for home consumption
4. Quantity used for payment in kind (as wages, gifts)
5. Total quantity marketed

6. Time of sale of the produce
  1. Prior to harvest
  2. Immediately after harvest
  3. After storing for a period
7. Where do you sell your produce. Specify the name and place of market.
8. How do you sell your produce

Source

Quantity sold

- a. Through Commission agent
  - b. Directly to merchants
  - c. Directly to consumers
  - d. Co-operative Society
  - e. Processing factories
  - f. Others
9. For direct selling
- a. Mode of transport
  - b. Road facilities
  - c. Type of buyer
  - d. Costs incurred in Marketing
    1. Transportation costs
    2. Loading, unloading
    3. Weighing charges
    4. Gate fee
    5. Market fee
    6. Deductions
    7. Spoilage
    8. Others (specify)
  - e. Price received/unit
  - f. Promptness in payment - whether there is any delay in getting the amount
  - g. Problems in marketing
    - 1.
    - 2.
    - 3.

h. Suggestions for improvement

- 1.
- 2.
- 3.
- 4.

INTERMEDIARIES

1. Type of Intermediary
2. Name and address
3. Experience in the business
4. Working expenditure

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Sl.No.	Particulars	Expenditure	Remarks
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1. Labour charges
2. Electricity charge/month
3. Water charge/month
4. Taxes paid

1. Sales tax
2. Income tax
3. Local tax
4. Professional tax
5. Others

5. Packing materials used
6. Others(specify)

5. Volume of business per year (month-wise)

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Month	Total purchased		From whom purchased	Transport		Loss in port	Load- ing & unloading charges	Con- tract, if any and method
	Qty.	Price Value		Mode	Dis- Cost tance			

---

January  
 February  
 March  
 April  
 May  
 June  
 July  
 August  
 September  
 October  
 November  
 December

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6. Quantity sold (month wise)

Month	Total sales		Spoilage		To whom sold	Weigh- ing charge	Market fee	IF C.A. commi- ssion if charges any	Con- tra- cts, etc	Oth er
	Qty.	Price	Qty.	Value						
January										
February										
March										
April										
May										
June										
July										
August										
September										
October										
November										
December										

7. From whom purchased:

<u>Sl.No.</u>	<u>Particulars</u>	<u>No.</u>	<u>Qty.</u>	<u>Price/Unit</u>	<u>Value</u>
1.	Broker				
2.	Commission agent				
3.	Village merchant				
4.	Growers				
5.	Pre-harvest contractors				
6.	Others (specify)				

8. How it was disposed off:

<u>Sl.No.</u>	<u>Particulars</u>	<u>No.</u>	<u>Qty.</u>	<u>Price/Unit</u>	<u>Value</u>
1.	To wholesale merchants				
2.	To Brokers				
3.	Commission agents				
4.	Processing units				
5.	Retailers				
6.	To agents at other places				
7.	Others (specify)				

9. Is grading done? Yes/No  
If yes, give particulars

	<u>Grades</u>	<u>Cost/Unit</u>	<u>Price/Unit</u>
If no, reasons:			





August  
September  
October  
November  
December

---

11. Problems in processing

- 1.
- 2.
- 3.

12. Market financing

<u>Sl.No.</u>	<u>Source</u>	<u>Amount</u>	<u>Period</u>	<u>Interest</u>
1.	Co-operatives			
2.	Commercial banks			
3.	Money lenders			
4.	Relatives			
5.	Others			

13. Do you provide finance to cultivator? Yes/No

If yes, terms and conditions under which it is given and at what stage of crop:

1. Written agreement
2. Mutual understanding
3. Interest charged
4. Others (specify)

14. Is there any obligation on the cultivator to sell his produce through you?

15. Ways and means to recover the credit in case he failed to sell his produce through you?

PROBLEMS IN MARKETING:

1. Transport

- a. Lack of transport facilities
- b. High cost
- c. Others

2. Storage:

- a. Absence of storage facilities
- b. High cost
- c. Others

- 3. Market finance inadequate
- 4. Absence of grading and processing
- 5. Fluctuating prices
- 6. Too many middlemen
- 7. Malpractices followed by traders
- 8. Problems of disposing the produce
- 9. Preparation to market
- 10. Absence of regulated markets

Suggestions to improve marketing:

- 1.
- 2.
- 3.

Appendix IIa. Input-wise cost of cultivation of pineapple for four years (Rupees per hectare)

Year	Sl. No.	Items	Class-I	Class-II	Class-III	District
I	1	Implements	55 (0.40)	76 (0.59)	85 (0.68)	68 (0.51)
	2	Human labour	8363 (60.35)	7623 (59.07)	7208 (57.44)	7895 (59.41)
	3	Planting material	2247 (16.22)	1904 (14.75)	1843 (14.68)	2056 (15.47)
	4	Fertilizers	1702 (12.28)	1914 (14.83)	2064 (16.45)	1842 (13.86)
	5	Taxes	5 (0.04)	5 (0.04)	5 (0.04)	5 (0.04)
	6.	Interest on working capital	1484.64 (10.71)	1382.64 (10.72)	1344.60 (10.71)	1423.92 (10.71)
		Total	13856.64 (100.00)	12904.64 (100.00)	12549.60 (100.00)	13289.92 (100.00)
II	1	Human labour	3498 (59.43)	3028 (54.05)	3070 (52.76)	3262 (56.42)
	2	Fertilizers	1702 (28.92)	1914 (34.16)	2064 (35.47)	1842 (31.86)
	3	Growth stimulants	50 (0.85)	55 (0.98)	56 (0.96)	53 (0.92)
	4	Taxes	5 (0.09)	5 (0.09)	5 (0.09)	5 (0.09)
	5	Interest on working capital	630.60 (10.71)	600.24 (10.72)	623.40 (10.72)	619.44 (10.71)
		Total	5885.60 (100.00)	5602.24 (100.00)	5818.40 (100.00)	5781.44 (100.00)
III	1	Human labour	3663 (63.76)	3144 (57.96)	3230 (56.90)	3419 (60.71)
	2	Fertilizers	1702 (29.62)	1914 (35.28)	2064 (36.36)	1836 (32.60)

(Continued)

Appendix IIa (Contd.)

Year	Sl. No.	Items	Class-I	Class-II	Class-III	District
	3	Growth stimulants	50 (0.87)	55 (1.01)	56 (0.99)	53 (0.94)
	4	Taxes	5 (0.09)	5 (0.09)	5 (0.09)	5 (0.09)
	5	Interest on working capital	325.20 (5.66)	307.08 (5.66)	321.30 (5.66)	318.78 (5.66)
		<b>Total</b>	<b>5745.20 (100.00)</b>	<b>5425.08 (100.00)</b>	<b>5676.30 (100.00)</b>	<b>5631.78 (100.00)</b>
IV	1	Human labour	3663 (63.76)	3144 (57.96)	3230 (56.90)	3419 (60.71)
	2	Fertilizers	1702 (29.62)	1914 (35.28)	2064 (36.36)	1836 (32.60)
	3	Growth stimulants	50 (0.87)	55 (1.01)	56 (0.99)	53 (0.94)
	4	Taxes	5 (0.09)	5 (0.09)	5 (0.09)	5 (0.09)
	5	Interest on working capital	325.20 (5.66)	307.08 (5.66)	321.30 (5.66)	318.78 (5.66)
		<b>Total</b>	<b>5745.20 (100.00)</b>	<b>5425.08 (100.00)</b>	<b>5676.30 (100.00)</b>	<b>5631.78 (100.00)</b>

\* Figures in paranthesis represent percentages of the total

Appendix IIB. Operation-wise cost of cultivation of pineapple for four years (Rupees per hectare)

Year	Sl. No.	Operations	Class-I	Class-II	Class-III	District
I	1	Preparatory cultivation	4169 (30.09)	4029 (31.22)	3591 (28.61)	4008 (30.16)
	2	Planting material and planting	3423 (24.70)	2872 (22.25)	2831 (22.56)	3128 (23.54)
	3	Manures, manuring and earthing up	2950 (21.29)	2992 (23.19)	3109 (24.77)	2995 (22.53)
	4	Weeding	1770 (12.77)	1548 (12.00)	1584 (12.62)	1662 (12.51)
	5	Miscellaneous expenses	60 (0.43)	81 (0.63)	90 (0.72)	73 (0.55)
	6	Interest on working capital	1484.64 (10.71)	1382.64 (10.71)	1344.60 (10.72)	1423.99 (10.71)
		<b>Total</b>	<b>13856.64 (100.00)</b>	<b>12904.64 (100.00)</b>	<b>12549.60 (100.00)</b>	<b>13290.59 (100.00)</b>
II	1	Manuring and earthing up	2950 (50.12)	2992 (53.41)	3109 (53.43)	2995 (51.80)
	2	Weeding	1770 (30.07)	1548 (27.63)	1584 (27.22)	1662 (28.75)
	3	Praying	320 (5.44)	295 (5.27)	308 (5.29)	310 (5.36)
	4	Protection of fruits	130 (2.21)	99 (1.77)	117 (2.01)	117 (2.02)
	5	Harvesting	80 (1.36)	63 (1.12)	72 (1.24)	73 (1.26)
	6	Miscellaneous expenses	5 (0.09)	5 (0.09)	5 (0.09)	5 (0.09)
	7	Interest on working capital	630.60 (10.71)	600.24 (10.71)	623.40 (10.71)	619.44 (10.71)
		<b>Total</b>	<b>5885.60 (100.00)</b>	<b>5602.24 (100.00)</b>	<b>5818.40 (100.00)</b>	<b>5781.48 (100.00)</b>

(Continued)

Appendix IIb. (Contd.)

Year	Sl. No.	Operations	Class-I	Class-II	Class-III	District
III	1	Manuring and earthing up	2950 (51.35)	2992 (55.15)	3109 (54.77)	2993 (53.15)
	2	Weeding	1770 (30.81)	1548 (28.53)	1584 (27.91)	1666 (29.58)
	3	Spraying	320 (5.57)	295 (5.44)	308 (5.43)	310 (5.50)
	4	Protection of fruits	240 (4.18)	180 (3.32)	225 (3.96)	218 (3.87)
	5	Harvesting	135 (2.35)	98 (1.81)	124 (2.18)	121 (2.15)
	6	Miscellaneous expenses	5 (0.09)	5 (0.09)	5 (0.09)	5 (0.09)
	7	Interest on working capital	325.20 (5.66)	307.08 (5.66)	321.30 (5.66)	318.78 (5.66)
		Total	5745.20 (100.00)	5425.08 (100.00)	5676.30 (100.00)	5631.78 (100.00)
IV	1	Manuring and earthing up	2950 (51.35)	2992 (55.15)	3109 (54.77)	2993 (53.15)
	2	Weeding	1770 (30.81)	1548 (28.53)	1584 (27.91)	1666 (29.58)
	3	Spraying	320 (5.57)	295 (5.44)	308 (5.43)	310 (5.50)
	4	Protection of fruits	240 (4.18)	180 (3.32)	225 (3.96)	218 (3.87)
	5	Harvesting	135 (2.35)	98 (1.81)	124 (2.18)	121 (2.15)
	6	Miscellaneous expenses	5 (0.09)	5 (0.09)	5 (0.09)	5 (0.09)
	7	Interest on working capital	325.20 (5.66)	307.08 (5.66)	321.30 (5.66)	318.78 (5.66)
		Total	5745.20 (100.00)	5425.08 (100.00)	5676.30 (100.00)	5631.78 (100.00)

\* Figures in paranthesis represent percentages of the total

Appendix III. Computation of pay-back period

a. Class-I

Year	Estimated cost (Rs.)	Progressive total of costs (Rs.)	Returns (Rs.)	Progressive total of returns (Rs.)
1	13856.64	13856.64	-	-
2	5885.60	19742.24	11589	11589
3	5745.20	25487.44	19115	30704
4	5745.20	31232.64	12372	43076

Pay back period: 2.77 years

b. Class-II

Year	Estimated cost (Rs.)	Progressive total of costs (Rs.)	Returns (Rs.)	Progressive total of returns (Rs.)
1	12904.64	12904.64	-	-
2	5602.24	18506.88	11453	11453
3	5425.08	23931.96	18691	30144
4	5425.08	29357.04	12294	42438

(Continued)

Pay back period: 2.78 years



Appendix III (Contd.)  
c. Class-III

Year	Estimated cost (Rs.)	Progressive total of costs (Rs.)	Returns (Rs.)	Progressive total of returns (Rs.)
1	12549.60	12549.60	-	-
2	5818.40	18368.00	11995	11995
3	5676.30	24044.30	18858	30853
4	5676.30	29720.60	13062	43915

Pay back period: 2.77 years

d. District

Year	Estimated cost (Rs.)	Progressive total of costs (Rs.)	Returns (Rs.)	Progressive total of returns (Rs.)
1	13290.59	13290.59	-	-
2	5781.48	19072.07	11627	11627
3	5632.26	24704.33	18934	30561
4	5632.26	30336.59	12476	43037

Pay back period: 2.77 years

# **PRODUCTION AND MARKETING OF PINEAPPLE IN TRICHUR DISTRICT**

BY

**JESY THOMAS K.**

## **ABSTRACT OF THE THESIS**

Submitted in partial fulfilment of the  
requirement for the Degree of

## **Master of Science in Agriculture**

Faculty of Agriculture  
Kerala Agricultural University

Department of Agricultural Economics

**COLLEGE OF HORTICULTURE**

Vellanikkara - Trichur

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## ABSTRACT

A study on the production and marketing of pineapple in Trichur district was conducted during March-April, 1982 to evaluate the costs and returns of pineapple production, the marketing costs and price spread as well as the problems faced by the cultivators.

Simple random sampling was adopted for selecting the sample and fifty cultivators were surveyed by personal interview method.

The total cost of cultivation per hectare of pineapple for four years for the district was found to be Rs.30334.92 and cost was highest for the first year being Rs.13289.92 (42.55 per cent). The major item of expenditure was human labour constituting about 59.32 per cent (Rs.17995) of the total costs. Expenditure on fertilizer accounted for 24.25 per cent (Rs.7356) and that for suckers 6.78 per cent (Rs.2056) for the district. With regard to the operation-wise cost of cultivation, manuring and earthing occupied a major share of 39.48 per cent (Rs.11976) and for weeding the expenditure was Rs.6656 (24.04 per cent).

Pineapple starts yielding in the second year and maximum returns was found to obtain in the third year with Rs.18934 per hectare for the district. The returns in the second and fourth year were Rs.11626 and Rs.12476 respectively. Cost of production per quintal of pineapple

fruits was highest in the second year (Rs.79.26) and lowest in the third year. with Rs.54.82 for the district. The pay-back period was 2.77 years, with a benefit cost ratio of 1.31, net present worth of Rs.8258.09 and internal rate of return of 43.37 per cent. The number of suckers per hectare was the factor which was found to be significant in the regression analysis.

The main marketing channel in the case of pineapple was producer Commission agent wholesaler \_\_\_\_\_ Retailer \_\_\_\_\_ consumer channel. The marketing efficiency assessed on the basis of price-spread and marketing costs revealed that there was a high price spread of Rs.94 per quintal and the producers got only 51.79 per cent of the consumer's price, while wholesalers and retailers got 17.69 per cent and 20.77 per cent margins respectively. Pineapple was marketed as fresh fruit commonly, but the canning industries in Trichur make a number of canned products such as squash, slices, titbits etc.

High cost of inputs, fluctuation in prices and improper marketing facilities etc. are the problems faced by the cultivators in this district. Non-availability of sufficient fruits to factories become a serious problem in the case of canning units.