Introduction
1 INTRODUCTION

The coconut palm (*Cocos nucifera* L.) is one of the world's major crop plants. It is a crop of great antiquity and has been known to exist in India since 3000 years ago. It has always been an object of reverence in local tradition and has been rightly extolled as the 'Kalpavriksha' - the all giving tree. Every part of the tree - fruit, frond and trunk - is of economic value.

India is one of the largest coconut producing countries of the world. With an area of about 1.1 million hectares and an annual production of about 6,000 million nuts, the country ranks third on the world map of coconut. The crop makes a significant contribution to the national economy with an average annual export earning of about Rs.300 million, mainly through the export trade of coir and coir products.

The crop is not grown in all the States of the country, but is confined to the coastal States, and even among them, the distribution is uneven. As much as 62 per cent of the total area and 55 per cent of the total production of the country is concentrated in Kerala which accounts for only 1.18 per cent of the total land area of the country.

Next to rice, coconut is the most important and extensively grown crop in Kerala. Coconut occupies about 32 per cent of the total area under cultivation and 42 per cent of the total area under commercial crops. The contribution of the crop to the annual income of the State is around 15 per cent and to the agricultural income around 30 per cent. Coir manufacture and copra crushing are the two traditional industries of the State developed side by side with coconut culture. Kerala is the traditional home of coir industry which is of considerable importance to the rural
economy of the State. The copra forms the raw material for a variety of industries connected with edible oil, cosmetics and cattle feed. The processing industries and other activities provide direct employment to over a million people in the State. It is estimated that about 70 per cent of the rural population depend on coconut, either directly or indirectly, for their livelihood. Thus coconut plays a vital role in the economy of the State and is closely connected with the domestic life of the people of Kerala.

During the past 25 year period from 1949-50 to 1974-75, the total area of the country under coconut cultivation had increased by 77.3 per cent with an average increase of 3.1 per cent per annum and the production of nuts had increased by 83.4 per cent with an average increase of 3.3 per cent per annum. According to latest estimates the per palm annual productivity of our country is only 35 nuts and the present production of coconut falls short of the domestic demand. One of the basic objectives of coconut development in the country is, therefore, to wipe out the deficit within the shortest possible time. The main reasons for low productivity of coconut in our country are lack of adequate management for maximum yield and reduction in yield caused by pests and diseases. Among the various diseases, the root(wilt) disease is the serious menace causing the maximum economic loss to the country. The annual loss caused by root(wilt) disease has been estimated to be approximately 340 million nuts. This fall in production has an adverse bearing in the economy of the country, as a whole, and the morale of the coconut grower, in particular.

The important operational aspects that warrant for increasing the production of coconut are (1) the expansion of the area under coconut, (2) the popularisation of high yielding hybrids and varieties, (3) the adoption of intensive agricultural practices for maximum production per
unit area, and (4) the prevention of the decline in yield caused by pests and diseases. In all the above aspects, optimum nutritional management is a pre-requisite for obtaining maximum yield improvements.

Various studies on the NPK nutrition of the palm have been conducted and the requirements of N, P and K for optimum growth and productivity have been established. But data on the role of calcium and magnesium in the nutrition of the palm under West Coast conditions are very limited and inadequate. The association of nutritional imbalance, particularly that involving Ca and Mg, with the incidence of root(wilt) disease has been indicated in most of the nutritional studies conducted on the disease. But specific data are not available to elaborate the possible role of Ca and Mg on the incidence of the disease. It was, therefore, felt necessary to conduct a systematic study on the role of Ca and Mg with varying levels of N, P and K on growth and yield, and on the incidence of root(wilt) disease on West Coast Tall palms which has been the most commonly cultivated variety in Kerala. The study was, therefore, conducted with the following main objectives:

1. To study the effect of Ca and Mg in combination with varying levels of N, P and K on growth, onset of bearing and productivity of the palm.
2. To elaborate the role of major nutrients, particularly that of Ca and Mg in combination with varying levels of N, P and K, on the incidence of root(wilt) disease and its effects on growth and yield.
3. To study the impact of heavy doses of NPK fertilizers in combination with Ca and Mg on the incidence and intensity of the disease.
4. To study the importance of Ca and Mg in the management of coconut plantation in root(wilt) affected areas.
5. To study the effect of continued use of fertilizers on nutrient build up in soil and coconut palm tissues in relation to growth and yield of the crop.

6. To correlate the leaf nutrient content with growth parameters and yield.