

Chemical studies on the leaf and Root (Wilt) diseases of coconuts in Travancore-Cochin *

I. Some observations of the incidence of the diseases

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DURING a rapid reconnaissance soil survey of Travancore and Cochin for a study of coconut soils with special reference to Leaf and Root (Wilt) diseases of coconut, certain observations were made regarding the occurrence and spread of these diseases. These observations are summarised in this paper.

ERRATIC SPREAD

Survey of the Leaf and Root diseases conducted earlier had shown that the diseases were in existence more than 85 years ago at Eratupettah in Meenachil taluk. Later on they were reported from Kaviyoor and Kalloppara in Thiruvalla taluk and a little later from Kayangulam. These places are more than 30 miles distant from one another and coconut areas

intervening were free from disease. Thus the diseases broke out in Travancore from more than one independent focus of infection. This fact was further confirmed in the present enquiry. Diseased tracts separated by a few miles of healthy areas were found almost throughout Travancore and Cochin. Pockets of infection were noticed in isolated places in Nallanad, Colamachel, Keezhcherry Vamanapuram, Thiruthymon, Elakamon, Ailam, Koduvazhanur, Elamba, Pazhayakunnumel etc. in south Travancore which is a comparatively healthy area free from disease. Places like Ponkunnam, in the eastern midland region is typical of this condition. During a tour from Moovattupuzha to Kottayam high incidence of disease was noticed round about Kuravilangad. In Shertallai extensive areas of good yielding gardens were found but towards the interior of Ponnammveli, near

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CHEMICAL STUDIES ON THE LEAF AND ROOT (WILT) DISEASES OF COCONUTS IN
TRAVANCORE-COCHIN

Shertallai town high diseased pockets were observed. These are only a few of the numerous instances of diseased area situated in the midst of healthy areas or *vice versa*. A very peculiar nature of the disease is that even in the same garden healthy trees are with their leaves almost touching those of the diseased ones. The truth of these statements can be noted even by the casual visitor travelling from Karunagappally to Ernakulam along the Trivandrum-Ernakulam trunk road. He could very easily locate diseased areas separated by healthy ones by distances which sometimes extend to a few miles and healthy and diseased trees existing side by side in the same garden.

ACTION OF WIND

There is a wide-spread belief that the Leaf and Root diseases are spread by wind. The popular name is '*Kattu Veezhcha*' meaning wind spread. Coconut growers reported that after the initial infection, the spread of the disease is in the direction of the wind. This belief is strengthened by the observation that the disease is first noticed in low lying areas on banks of the rivers and places adjacent to the paddy fields. If there are sharp bends or corners of coconut gardens jutting into the

field, the disease first appears there. These situations are subject to full wind action.

ACTION OF WATER

It is generally believed that the diseases made themselves significant after the great floods of 1882 when the land was under water and remained waterlogged for a considerable period. During the survey additional evidence in support of this was obtained. Palms growing on banks of rivers which remain flooded for some days every year during the monsoons or in situations which are waterlogged or has the water-table quite near the surface were severely infected.

TO ILLUSTRATE

The Palace Ward, Alleppey, land surrounding the Lakshmipuram palace garden, Changanacherry and certain localities in Kumbalangi which are waterlogged areas and in some portions of the banks of Kallada, Meenachil and Thodupuzha rivers subject to flooding serious outbreak of the diseases was observed.

One very striking case of infection probably connected with the water movements was observed near Kandampuzha ferry — a ferry of the Kallada river, about 18 miles to the north east of Quilon. About two miles to the

112

CHEMICAL STUDIES ON THE LEAF AND ROOT (WILT) DISEASES OF COCONUTS
IN TRAVANCORE-COCHIN

(Wilt) diseases were also found in all these typical classes of soils. With regard to the upland and midland regions and the hill slopes it was particularly interesting to know that while some of the hill slopes contained very healthy palms, the palms on adjoining slopes were diseased. In Kanjirappally area, for instance at a height of 800-1000 ft. above the sea level, some of the hill slopes were found healthy while others were diseased. Similar observations were made in the Regional Research Station, Thodupuzha. Drought, unsuitable soil conditions, parasitic organisms or virus infection may be prime causes of the diseases, but it is difficult to explain why one of the slopes gets the disease while the other does not. It is, therefore, ventured to suggest that the mineralogical composition of the rocks of the hills may be different, that the products of weathering of the rocks may contain some toxic material which may cause disease incidence in the slopes and valleys and further these materials carried

by rain water to the rivers may get deposited at different points along the course of rivers thus creating foci of the infection quite independent of each other.

The work of Menon and co-workers of the Central Coconut Research Station, Kayangulam has definitely established that the leaf disease is caused by parasitic fungal organisms like *Helminthosporium halodes*, *Gloeosporium* sp., *Gliocladium roseum* and *Fusaria*. These workers have also isolated fungi like *Rhizoctonia solani*, *R. bataticola* and *Botryodiplodia theobromae* from roots of palms affected by the Root (Wilt) disease. Virus investigations started recently have given indications that the disease may be of virus origin. Chemical studies have revealed differences in the chemical make up of soil of healthy and diseased tracts. However, in view of the observations recorded above, it is suggested that the possibility of water in some way not yet explained, being the cause or the carrier of a parasitic or a toxic factor, may not be overlooked.