

# COCONUT ROOT [WILT] DISEASE IN TRICHUR DISTRICT

## 1. Observations on the distribution and intensity of the disease

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### Introduction

The coconut root (wilt) disease, according to a comprehensive survey (Gopinathan Pillai *et al.*, 1973) is prevalent in Kerala from Trivandrum district in the south to Trichur district in the north, extending from the Western ghats to the sea coast. The disease was reported to be sporadic in the northern and southern extremities of this area namely in Trichur and Trivandrum districts. Although the disease is not fatal, due to its debilitating effect reduction in yield to the tune of almost 340 million nuts annually was estimated (George *et al.*, 1976). In view of the huge economic loss and in the absence of an effective method of control for the disease, a field oriented programme "to contain the disease" was initiated in 1979 with the establishment of a Field

Station at Irinjalakuda. Eradication of all diseased palms followed by phytosanitary and plant protection measures was envisaged to be implemented in a belt along the natural boundary of a river [Karuvanoor] and a road [Amballur - Palappilli] in Trichur District. Initial observations on the distribution and intensity of the disease in this area form part of this programme.

### Area of operation

A belt stretching from the foot hills of Western ghats to the backwater area covering parts of Varandarappilli and Amballur villages, Arattupula, Urakam, Inchamudi, Kurumbilavu and Kiluppillikkara villages formed the border. Besides these eight villages, Nadattara lying on the bank of Manali river a little farther to the

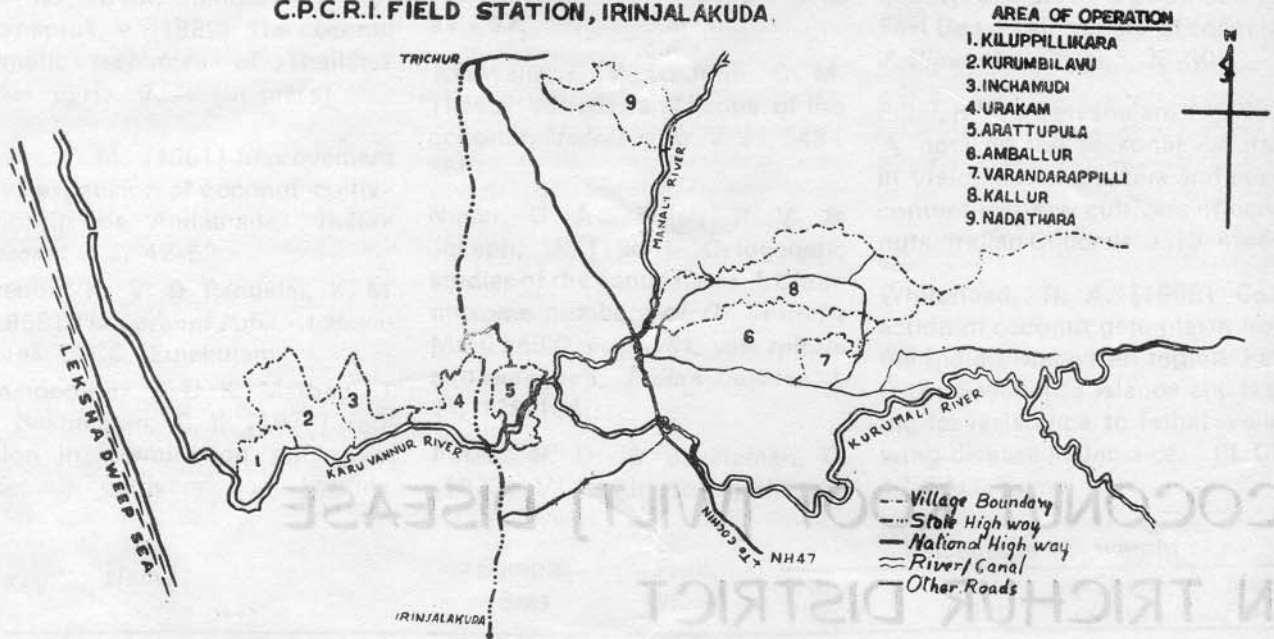
north was also included as disease incidence was recorded there in 1973 [Fig. 1].

These nine villages may be broadly grouped into three - [i] those in the hilly undulating terrain with laterite soil namely Varandarappilli, Amballur, Kallur and Nadattara, [ii] those lower down in plains along the northern bank of the Karuvanoor river-Arattupula, Urakam, Inchamudi and Kurumbilavu mainly having light soils and [iii] Kiluppillikkara in the coastal backwater area. Amballur-Palappilli road runs through Varandarappilli and Amballur villages and only the area on the northern side of the road has been included in the programme. The distinguishing features of these three groups of villages are the undulating topography with hard laterite soils with low water-table of

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Fig. 1

C.P.C.R.I. FIELD STATION, IRINJALAKUDA.



7.5-12.0 m in summer, intercropped with arecanut, pepper, cocoa, banana, betelvine, mango and jack in the former and laterite soils mixed with light sandy and loamy soils with high watertable of 2.5-3.5 m and subject to inundation during monsoons, having a few or no intercrops in the second group and the more or less monocrop of coconut in sandy and

sandy loam soil subject to inundation in Kiluppillikara.

**Distribution of disease**

Garden to garden survey was carried out from the boundary of the river and road to 3 km towards the north in the eight villages besides a complete survey of Nadattara. The population of root [wilt] affected palms, their

age, number of leaves and nuts were recorded.

Four hundred palms were found to manifest the foliar symptoms of root [wilt] disease, namely flaccidity, yellowing and marginal necrosis of leaflets. These palms were located in 209 gardens in an area of about 20,000 ha of the eight villages along the border. Nadattara was free of disease. [Table 1].

Table - I

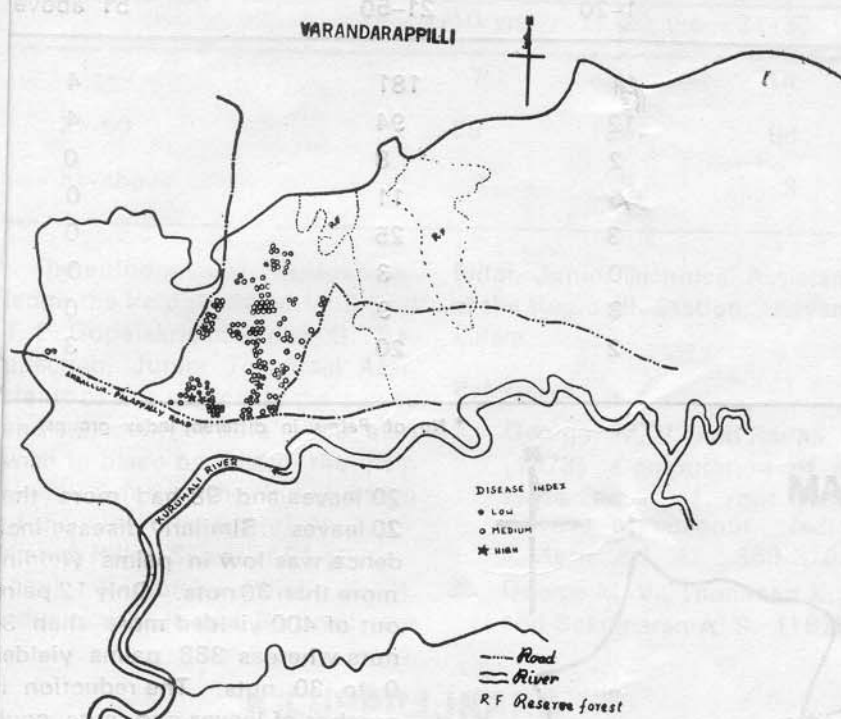
Distribution of diseased palms in different villages

Village	Number of diseased palms	Number of gardens
1. Varandarappilli	196	83
2. Amballur	110	67
3. Kallur	10	5
4. Arattupula	16	8
5. Urakam	28	17
6. Inchamudi	3	2
7. Kurumbilavu	12	9
8. Kiluppillikara	25	18
	400	209

The spatial distribution of the diseased palms in three villages representing the three groups are presented in Figs. 2, 3 & 4 to indi-

having loamy soil interspersed with hillocks and laterite bed as well as in Kiluppillikara [25] having light soil with waterlogging.

reported by them about eight years back increased to 316 in laterite soils as against 84 in light soils.



**Fig. 2**  
Distribution of root (wilt) diseased palms at Varandarappilli

**Intensity of disease**

The diseased palms were indexed for the disease severity following the formula of George and Radha [1973] and are presented in Table 2. Of the 400 diseased palms, 87.75 per cent were in the middle stage of disease, 9.50 per cent were lightly diseased and 2.75 per cent were severely affected.

In general, the majority of the palms were moderately diseased while a small percentage were in the advanced stages. These advanced cases occurred only at the two ends of the border, namely, Varandarappilli and Amballur in the hilly terrain with low water-table and Kiluppillikara near the backwaters under waterlogged situation.

**Age of the diseased palms**

Of the 400 diseased palms, the highest incidence of disease was in the age group 11-20 yrs as has already been reported by Ramadasan, *et al.* [1971]. Palms in the actively bearing stage [21-30 yrs] also are more susceptible to the disease than young palms [1-10 yrs] and older ones [31 yrs and above]. Disease intensity-wise also frequency of disease development was more in the bearing stage [11-30 years] (Table-3).

**Disease incidence in relation to vigour of palms**

Disease incidence was less in palms having 21 or more leaves. 302 diseased palms had less than

cate the probable significance of soil environments viz., a hilly terrain, alluvial bed and waterlogged situation on disease incidence.

The scattered distribution and erratic spread of the disease had already been reported by earlier workers [Menon and Nair, 1949; Gopinathan Pillai *et al.*, 1973]. In mildly affected area in the northern border of diseased zone also a similar pattern was observed. The disease is predominant at the foot hills and neighbouring areas in the laterite bed, thus the two villages Varandarappilli and Amballur accounting for 306 diseased palms. Lower down towards the west, the disease is more frequent in Urakam [28]

Among the villages along the Karuvanoor river Urakam has a wider water-front than the rest. In this village 22 of the 28 diseased palms were located on the river-bed. Similarly, majority of the diseased palms in other villages also were located along the riverside or waterways. The disease proneness in such divergent situations calls for critical assessment of the adverse soil conditions.

The spread of the disease is reported to be lower in laterite soil compared to sandy soils based on the observations in individual plots [Gopinathan Pillai *et al.*, 73 & 1980]. However, area-wise, the random occurrence of disease

Table - 2

Intensity of disease in different villages

Village	Disease Index *		
	1-20	21-50	51 above
Varandarappilli	11	181	4
Amballur	12	94	4
Kallur	2	8	0
Arattupula	5	11	0
Urakam	3	25	0
Inchamudi	0	3	0
Kurumbilavu	3	9	0
Kiluppillikara	2	20	3

\* No. of Palms in different index groups

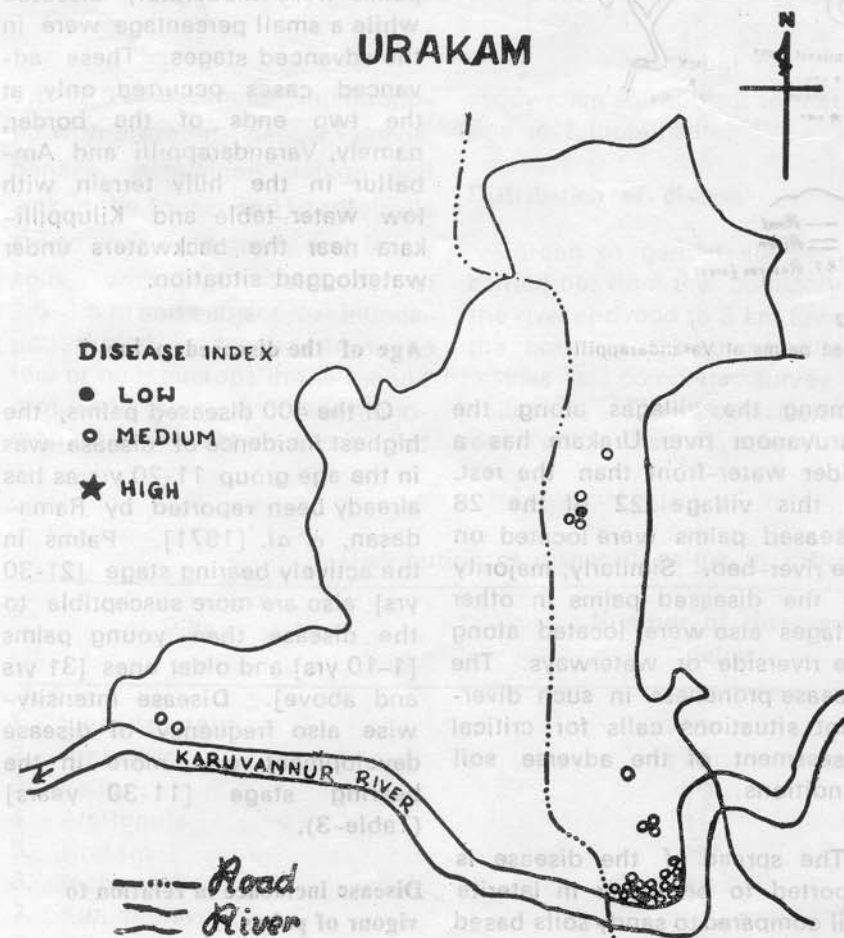


Fig. 3

Distribution of root (wilt) diseased palms at Urakam

20 leaves and 98 had more than 20 leaves. Similarly disease incidence was low in palms yielding more than 30 nuts. Only 12 palms out of 400 yielded more than 30 nuts whereas 388 palms yielded 0 to 30 nuts. The reduction in number of leaves and nuts could probably be an effect of the disease or may be that less vigorous palms are more prone to the disease.

Further detailed observations on the soil-plant environment in lightly diseased area is likely to throw light on these aspects since Piilal *et al.*, [1975] has already indicated that the nutrient status of the apparently healthy palms in the disease affected tract is more comparable to the diseased than the healthy palms.

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**Table - 3**  
Disease in relation to age.

Disease Index	No. of palms in age group of				
	1-10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	40 yrs & more
1-20	7	9	14	2	6
21-50	58	126	98	49	20
51-above	3	3	3	1	1

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Pillai, Junior Technical Assistants of the Regional Station, Kayamkulam.

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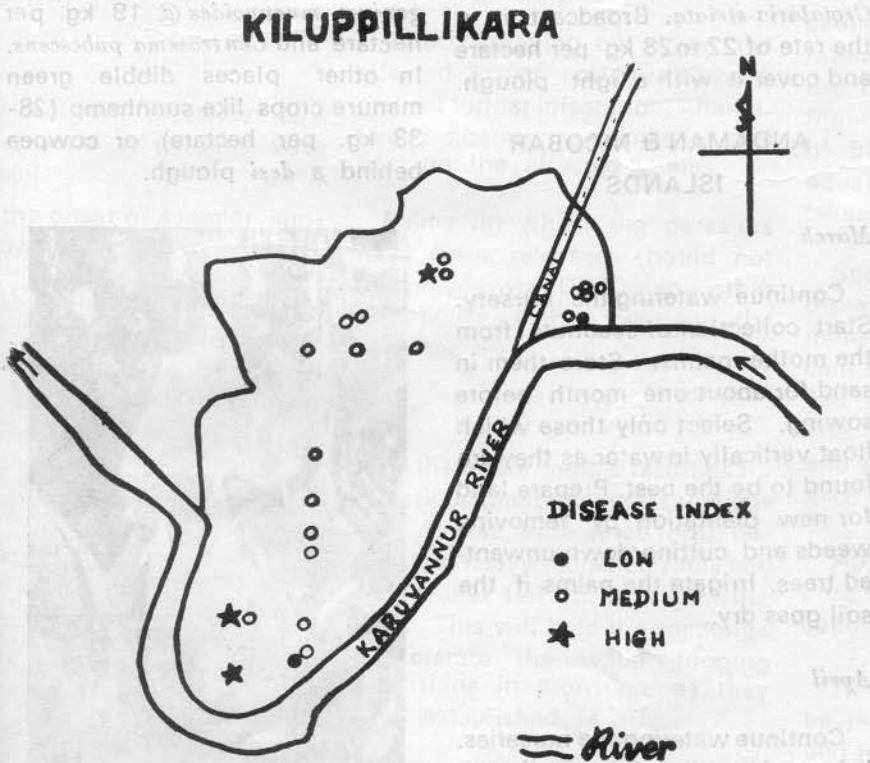


Fig. 4

Distribution of root (wilt) diseased Palms at Kiluppillikara