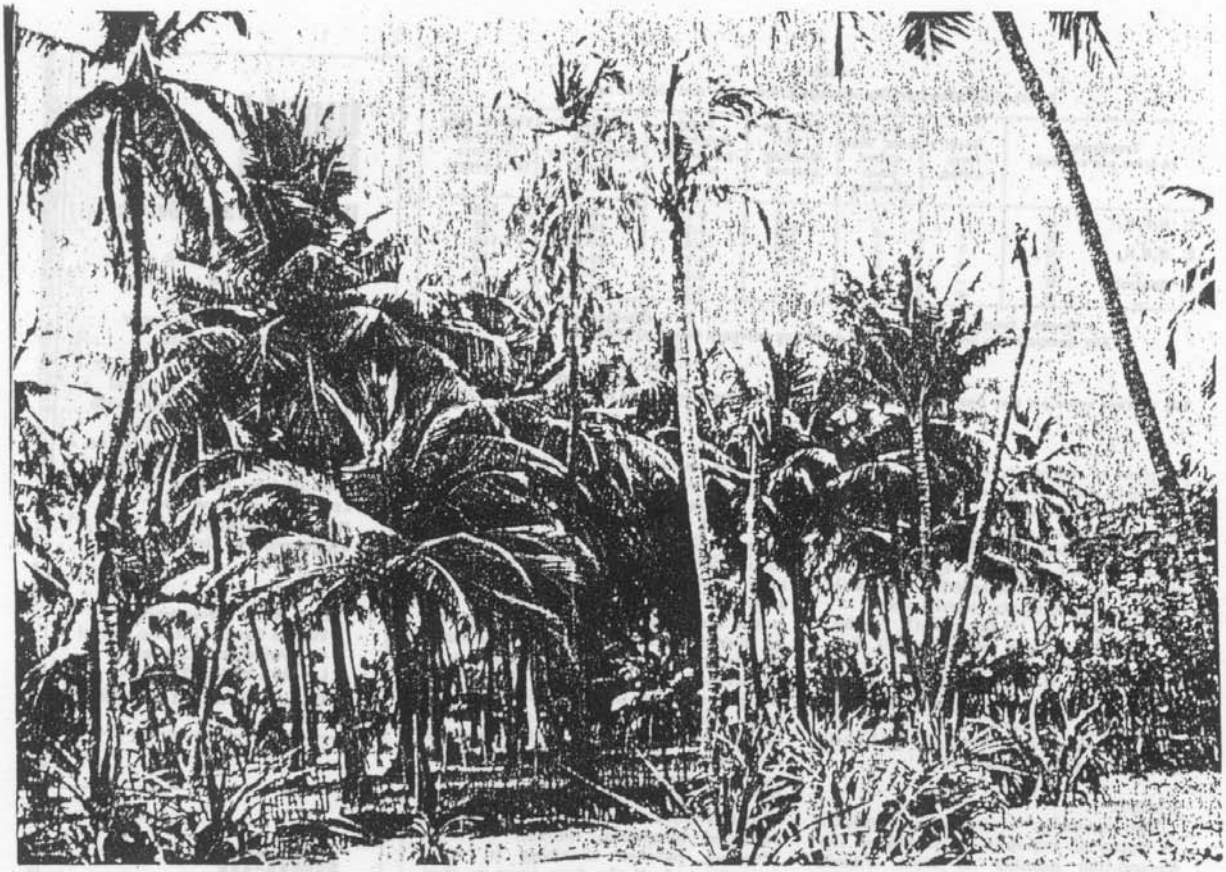

A coconut garden affected by wilt. Decapitated trunks of trees in advanced stages of the disease contrast with the healthy palms in the background

A serious wilt disease of coconut is prevalent in the coastal areas of Tamil Nadu, India. It particularly affects the Thanjavur district, where considerable havoc has been reported since the cyclones of 1952 and 1955. Palms within the age-group of 10–25 years are particularly susceptible and recovery is very rare. Investigation of this disease has been in progress in Thambikottai, Thanjavur, since 1965 under a scheme financed by the Indian Council of Agricultural Research.

FERTILIZERS ARE FOUND TO INFLUENCE

Coconut wilt disease

IN INDIA

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COCONUT wilt disease is a complex disease in which soil, weather and other environmental factors play an important role in the disease syndrome.[4] The result of a comparative analysis of soils for the available nutrients, exchangeable calcium and *p*H have not shown any appreciable differences between healthy and diseased soils. Both healthy and diseased soils indicate low nitrogen and available P_2O_5. The leaves of diseased trees showed slightly higher N status and lower K and Ca status and wider N/K ratio as compared to healthy samples. Trials with fertilizers were initiated during the period 1965–70 to observe the effect of fertilizers on the incidence and progress of the disease and the results are reported here.

Method of treatment

The fertilizers were applied once in a year for five years during the period August to December in circular basins formed 1·5m round the base of the trees. Regular observations on the

Table 1

Effect of fertilizers on the intensity of infection and yield of nuts

Treatment (4 trees per variant)		No of trees wilted	No. of trees with active stem bleeding	Total no of bleeding patches	Total height of patches in metres	Disease* index (average per tree)	Yield of nuts per tree (average for 3 years)
1. $N_1P_1K_1$	H	–	1	2	0·15	0·5	106
"	D	1	4	419	5·69	49·5	82
2. $N_2P_2K_2$	H	1	3	452	4·98	48·75	129
"	D	4	4	6137	14·79	265·5	110
3. Control	H	–	1	3	0·54	1·5	88
"	D	1	3	12	3·28	33·5	65

H – Healthy trees. D – Diseased trees.

*The disease index was calculated by assigning category values as follows:

Wilted trees	100
Bleeding patches	0·1 per patch
Height of patch	10 per metre height

The average value per tree was considered for comparative assessment of the treatment.

progress of infection, condition of trees and yield data were recorded during the period and extended up to a period of 18 months after the last annual treatments. Randomised individual trees of same age and vigour in typically wilt affected area were selected. The details of the treatments are listed below:

1. $N_1P_1K_1$* (N 0·2kg, P_2O_5 0·2kg, K_2O 0·5kg per tree per year). Normal recommendation.
2. $N_2P_2K_2$ (N 0·4kg, P_2O_5 0·4kg, K_2O 1·0kg per tree per year).
3. $N_0P_0K_0$ Control.

*Only straight fertilizers were used until the completion of the trial.

Results

The intensity of infection recorded in terms of different attributes of the disease-like number of trees wilted, number of trees with active stem bleeding, total height of bleeding patches, a disease index worked out to combine all these attributes and the average yield data for the last three years are presented in table 1. Apart from wilting of trees, the extent of stem bleeding (which is an important symptom in Tamil Nadu wilt disease) was also considered as a symptom of the disease while assessing the progress of infection.

It would be seen from the table that the disease incidence was aggravated by the application of higher dose of fertilizers ($N_2P_2K_2$) both on healthy and diseased trees, while the incidence was comparatively less in the healthy group of $N_1P_1K_1$ and control treatments. The maximum yield was recorded under $N_2P_2K_2$-H followed by $N_2P_2K_2$-D and $N_1P_1K_1$-H. The higher dose of fertilizers enhanced the yield whether applied to healthy or diseased trees, whereas the single dose pushed the yield only in healthy series.

Discussion

There is very little data on the influence of fertilizers and manures on wilt disease of coconut. However, emphasis was given on improving the soil conditions and nutrition of trees as a safeguard against this serious malady. Cooke recorded symptoms like withering, tapering stem, reduction in size of the crown to result from nutrient deficiencies in 1950.[2] Similar symptoms are always associated with Tamil Nadu wilt. Yellowing of leaf tips and general chlorosis have been remedied by application of complete fertilizer mixture as long ago as 1940.[1] Briton-Jones reported that good results against stem bleeding were obtained by a system of drainage cultivation and manuring. Sahasranamam indicated that manuring with standard dose of fertilizers did not arrest the progress of root wilt disease on trees in advanced stages of infection.[3] He did not recommend higher doses as it aggravated the incidence. Results of the present trial are in full agreement with that recommendation in that higher levels of NPK increased the disease intensity. Any additional NPK recommendation to diseased trees must be given with caution, therefore. The diseased trees under $N_2P_2K_2$ series had recorded maximum number of stem bleeding patches resulting in total mortality of all the four trees in that treatment. Further, in all the wilted trees in this treatment the stem bleeding had extended up to the crown. This particular symptom makes the disease different from other wilt diseases like Cadang-Cadang of Philippines, (root) wilt of Kerala and lethal yellowing of West Indies.[4] This lethal effect may be due to some imbalances in NPK, particularly N/K ratio which predisposed the palm to infection. The normal dose did not seem to have any harmful effect on the healthy trees and at the same time increased the yield without any loss of trees. The application of higher level of NPK increased the yield of nuts of both healthy and diseased trees, while normal dose showed some response on healthy trees only.

Acknowledgment

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