

YELLOW LEAF DISEASE OF ARECANUT : BIOCHEMISTRY AND MICROBIOLOGY

N. P. Jayasankar

(GPCRI., Regional Station, Krishnapuram 690 533, Kerala)

An enumeration of the bacteria actinomycetes and the fungi in the root zone of healthy and diseased arecanut palms at Palode (South Kerala) revealed a higher incidence in the diseased compared to healthy (Anonymous, 1964). The mean populations in the healthy were 6.18 for bacteria, 0.31 for actinomycetes and 0.51 for fungi while the diseased samples recorded 8.11 for bacteria, 0.35 for actinomycetes and 0.79 for fungi. It did not however give any indication on the specific microflora proliferating or diminishing in the root region. Soil microbial populations in different soil profiles were similarly more in diseased gardens, harbouring higher numbers of bacteria, actinomycetes and fungi compared to healthy gardens. Representative soil samples were collected from arecanut gardens at 0,15 cm. and 30 cm. depths and microflora then enumerated by dilution plate method.

The results of Radha Menon (1961) gave strong indications for the presence of nucleoproteins in diseased arecanut leaves and its absence in healthy leaves. These observations call for detailed studies to characterize the associated nucleoproteins. The difference observed in the electrophoretic patterns and paper chromatograms between healthy and diseased leaf extracts offers good scope for developing diagnostic tests before the onset of visible symptoms. Other studies carried out at Palode (Anonymous 1962) indicated an enhanced succinic dehydrogenase activity in the sap of diseased arecanuts.

Nair (1969) studied the amino acid make-up in different parts of healthy and diseased palms. The amino acid content of diseased leaves (cystine, aspartic acid and threonine) showed a fall in the early and middle stages of the disease and an accumulation in advanced stages. On the other hand, lysine and arginine contents of leaves progressively increased with advancement of disease. The amino acids serine and glutamic acid were absent in leaves but present in large quantities in the inflorescence. Glutamic acid was absent in inflorescence and nuts of healthy palms and present in diseased materials. At the same time, tryptophan, tyrosine and valine were

absent in diseased inflorescence. The important amino acids of the arecanut stem were found to be serine, arginine and threonine in descending order but their quality showed a decline with increase in intensity of disease. Proline, cystine and histidine were found in roots of healthy palms, but their quantity began to fall with the onset of disease and they totally disappeared in advanced stages. These results suggest an impaired amino acid metabolism as a characteristic feature of the disease.

To sum up the existing information on microbiological and biochemical studies does not provide any conclusive indications on the etiology, management practices or the mechanism of the metabolic alterations leading to the manifestation of symptoms.

Work in progress

Microbiological investigations are in progress on the beneficial influence of crop-mixing-cowpea, Guinea grass and the fodder grass NB 21 with arecanut palms—under irrigated and nonirrigated conditions. The nitrogen fixing bacteria and the phosphate solubilising microflora in the arecanut soils are being enumerated.

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