

RP-58

VIRUS DISEASES OF INTERCROPS IN COCONUT GARDENS

By N. Gopinathan Pillai*

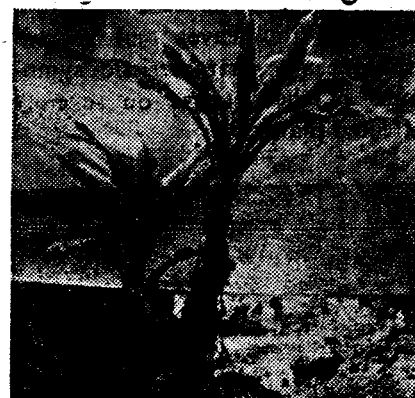
Intercropping in coconut gardens is a popular practice in Kerala. Both annual and perennial crops are grown as intercrops. Banana, vegetables, tapioca, areca, etc. are some of the common intercrops. In household gardens, spices like ginger, turmeric, etc. are also grown. Besides providing substantial additional income, cultivation of such intercrops with proper manurial and cultural operations will also pave the way for stepping up the yield of the main crop. But many such intercrops suffer from serious fungal as well as virus diseases. The following is a brief account of the common virus diseases of intercrops grown in coconut gardens.

Banana Bunchy Top

Banana is the most important intercrop grown extensively in coconut gardens in Kerala. This crop suffers from a serious virus disease known as the 'Bunchy top', which causes complete destruction of the crop. This disease was first observed in Fiji about the year 1891. Since then it has been reported from Ceylon, Australia, Ellice Islands, Bona Islands and Egypt.

Symptoms of this disease are generally seen in any stage of growth—in young emerging plants or in adults. Infected plants are markedly stunted. Appearance of irregular dark green streaks along the secondary veins of the lamina or along the midrib or petiole, on the under surface of the lower portion of the first unfurling leaves mark the beginning of the disease. As the disease progresses, transverse wrinkling along with dark green streaks appear along the length of the completely rolled lamina or pipe. The leaves become stunted, narrow, brittle, upright, slightly rolled and attain a pale yellow colour. After the emergence of several such leaves, they become bunched together at the apex of the pseudo-stem resulting in a 'rosette'. In advanced stages of 'Bunchy top', the root system of the affected banana shows a greater degree of decay than that of the healthy ones.

This disease is caused by a virus—'Banana Bunchy Top Virus'. The spread of the disease is through an aphid vector—*Pentalonia nigronervosa*. Exclusion and eradication of the infected plants and plant parts is the only possible solution



Banana Bunchy Top

for the control of the disease. Prompt destruction of all stools as soon as symptoms appear, prevention of use of infected suckers for cultivation, etc. will prove to be effective in reducing the incidence of the disease. Spraying and dusting of insecticides such as nicotine sulphate, calcium cyanide, chlorocides, etc. have also been recommended for killing the aphids, as they are supposed to be responsible for the spread of the disease.

Cassava mosaic

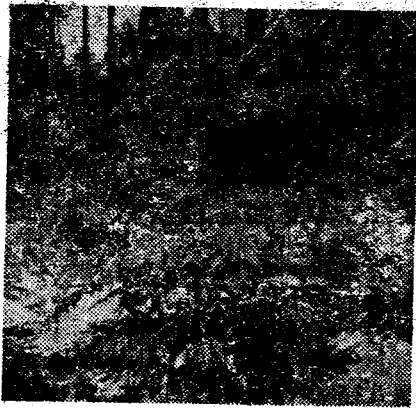
'Cassava', commonly known as tapioca, is another profitable and most important tropical root crop occupying a major portion of the

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total acreage devoted to subsidiary crops in Kerala. It is the staple food next to rice, of the common man in this part of India.

A mosaic disease on cassava is of common occurrence. This disease has been known to occur in East Africa since 1894 and now causes extensive loss in western and central Africa. It has also been reported from Brazil.

The symptoms of the disease are seen generally on the leaves. Leaves of the affected plants show crinkling and distortion, together with pale yellow or nearly white chlorotic patches. Such chlorotic areas may vary depending on the intensity of the disease. A reduction in size of the leaves and general stunting are characteristic symptoms of the disease on severely affected plants.



Cassava Mosaic

The cause of this disease is reported to be a virus known as "cassava mosaic virus". The disease spreads through small white flies—'Bemisia spp.' Cultivation of disease resistant varieties is the only possible method of control.

Yellow vein mosaic of Bhendi

"Bhendi" (*Hibiscus esculentus*) is another important vegetable intercrops in coconut gardens. It also suffers from a virus infection known as "yellow vein mosaic virus."

This disease was reported from Bombay in the year 1924 and is widely prevalent in many parts of India, and Kerala is no exception.



Yellow Vein Mosaic of Bhendi

Affected plants bear malformed distorted leaves having homogeneous interwoven net work of bright yellow veins and irregular chlorotic patches on the lamina. Sometimes the internodes also show yellow colour. In severe infection the plants become stunted, the young leaves show general chlorosis and yield goes down markedly. The fruits, if produced on such plants, do not develop to normal size and turn pale and crinkled having tough skins unlike that of the healthy ones.

The disease is generally transmitted by the agency of an insect vector—the white fly. This vector retains the virus throughout its life time and transfers it from plant to plant causing utter annihilation of the crop.

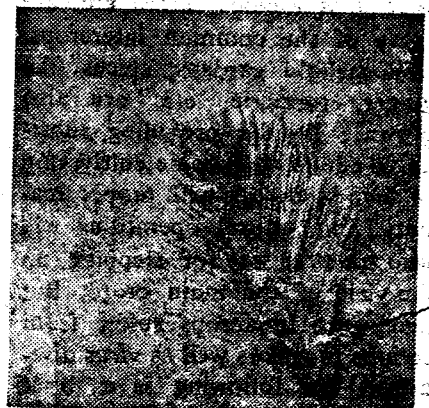
No proper method of control has so far been reported. Once a plant is affected by this disease it lasts as long as the plant exists. However, removal and destruction of all infected plant debris from the field, rouging of all the infected plants as soon as they are detected in the field, spraying the seedlings with dilute pyrethroid or derriphyton to destroy the insect vector, removal and destruction of other weeds in the field, etc. have been recommended to arrest the spread of the disease. Certain resistant varieties

have been evolved by the Indian Agricultural Research Institute, New Delhi and the seeds are available for distribution.

Yellow leaf disease of Areca

Areca nut is an important plantation crop generally cultivated in coconut gardens. This crop suffers from a mysterious disease "the yellow leaf" which causes great damage to the crop and is prevalent in southern and central parts of Kerala. A similar malady is also reported from certain parts of Mysore.

Palms affected by this disease show characteristic yellowing of the foliage. Generally, yellowing starts from the tips of leaflets and gradually extends to the entire lamina. The roots of the infected palm get reduced and the root tips turn black. The nuts do not grow to their full size. The



Yellow Leaf of Areca

kernel turns black in some cases and becomes unsuitable for chewing. As the disease advances the leaves become successively smaller and the crown gets reduced in size.

The cause of the disease is not definitely known. However, a mechanically transmissible virus is suspected to be associated with the disease. Removal and destruction of infected palms, application of lime, heavy manuring, etc. have been recommended for reducing the incidence of the disease and increasing the yield.