

## Little Leaf of Brinjal

The disease, perhaps present only in our country, is found in all brinjal-growing areas. It was first reported from Coimbatore (Tamil Nadu). The disease causes heavy losses and young plants fail to produce flowers and fruits due to infection.

Symptoms - The ~~leaf~~ chief symptom is the very short leaves produced on the attacked plants. The petioles become very much reduced and the leaves appear very close to the branches and stem. Infected leaves are narrow, soft, smooth and yellowish in colour. Any new leaf coming out also becomes reduced in size. The internodes are much shortened and at the same time large number of axillary buds are stimulated to grow into short branches with small leaves. This gives the plant a bushy habit. The plants do not form flowers. If flowers are formed at all they remain green. Fruits are formed rarely.

Causal organism - The disease is caused by a mycoplasma. Till 1969, the disease was thought to be caused by a virus. The structures from the sap of affected leaf appear spherical or oval in shape, 40-300  $\mu\text{m}$  in diameter and without a cell wall. In the field the disease is transmitted by the vector, *Cestus phycitis*. This mycoplasma also attacks

*Datura fastuosa* and *Vinca rosea*. It is possible to transmit the agent to tomato, potato and tobacco. Perhaps the agent survives on weed hosts also.

Control — ~~Control~~

- i) Antibiotic treatment with tetracyclines, as achromycin, terramycin, aureomycin etc.
- ii) Eradication of weed hosts and diseased terminal plants from the field.
- iii) Control of insect vectors by insecticides.

# Tobacco Mosaic Virus Disease

This is best known of all plant virus diseases. The tobacco mosaic virus affects all dicotyledons plant of which most important are Tobacco and Tomato.

Although Adolf Mayer (1886) first pointed out the mosaic pattern on leaves of the affected tobacco plants. Iwanowski (1892) demonstrated that tobacco mosaic virus would pass through a bacteria proof filter. He was able to demonstrate that a diseased tobacco plant was able to induce mosaic disease in healthy tobacco plants. Stanley (1925) first isolated crystals of tobacco mosaic virus and indicated their paracrystalline nature. whereas C.A. Knight showed that the tobacco mosaic virus is made up of sixteen different amino acids.

The tobacco mosaic virus affect photosynthetic tissue of the host leading to distortion, blistering and necrosis. It also causes dwarfing of affected plants. It is one of the most damaging viruses of plants, causes enormous loss of tobacco crop by reducing yield and quality.

Symptoms → The symptom is systemic mosaic type. The primary symptom of young leaves is faint circular chlorotic lesions that appear with gradual vein clearing. With the maturity of the leaves, abnormally dark green spots appear which develop into irregular crumpled blister like areas while rest of the tissue becoming more or less chlorotic. The development of symptom is governed by many variable factors of which the most important is the typical strain of tobacco mosaic virus may cause yellow mottling of the leaves, a second day cause necrosis only, while a third day includes a gross malformation. The disease is seldom fatal to the host.

### CAUSAL ORGANISM (The Virus) →

The typical tobacco mosaic virus is TMV-1, *Marmor tabaci* (Holmes). The virus remain active in extracted host plant juice even upto 25 years. It is a very resistant virus. The thermal inactivation point of virus is  $90^{\circ}\text{C}$ . The Virus particles are rod shaped, measuring  $280\text{ m}\mu$  in length by  $15\text{ m}\mu$  in diameter. Chemically these are nucleoprotein particles. Nature of particles - undifferentiated, homogenous, rod shaped.

The young seedlings and the transplants get inoculated during human handling. It results in systemic mosaic appearance. Simultaneously it may get transmitted mechanically by man during field operations. This ~~constitutes~~ constitutes the "active phase" of the TMV disease cycle, while perennating viruses in plant debris, tobacco refuse, perennating hosts, cigarettes and any other kind of tobacco constitute the "dormant phase" of the disease cycle.

However secondary cycle is important in this disease, because transmission by mechanical means are quite essential.

CONTROL → Following are some of the suggested control measures -

- ① Seed beds should be located at a great distance from the tobacco warehouse.
- ② Seed bed should be free from any previous tobacco refuse.
- ③ Seed bed soil should be sterilized by steam.
- ④ care should be taken to avoid contamination through hands and cultivation implements.
- ⑤ Smoking or chewing of any kind of tobacco should be avoided near field.
- ⑥ Susceptible hosts, weed or otherwise in which virus may harbour, should be destroyed.
- ⑦ Previous years plant debris should be destroyed by burning.
- ⑧ Diseased plants should be removed and burnt to stop further spread of disease.
- ⑨ Growing resistant varieties produces good results.

## Disease cycle →

The virus ~~perennates~~<sup>perennates</sup> in infected tobacco plant debris, tobacco refuse from warehouse, cigarettes, Cigar, pipe and chewing tobacco and in perennating hosts which form the source of primary inoculum.

This is one of the most common infection of plant virus. The virus is disseminated from plant to plant by mechanical transmission, by handling tobacco plants during transplanting through other field operations, and, contact by man and cultivation implements. The virus enters in the host-tissue, it multiplies very rapidly producing disease symptoms.