

PHLOEM NECROSIS VIRUS DISEASE OF TEA

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Phloem Necrosis is a virus disease that affects seedling tea causing a general debilitation of the tea bush with eventual decline in yields to uneconomic levels. Traditionally, the most affected areas by this virus disease have been the Nuwara Eliya and Kandapola sub-districts. But, I have noticed that this disease is now evident in the Maturata, Udapussellawa, Ramboda and Bandarawela sub-districts as well perhaps due to the changing weather patterns involving changes in temperature. In fact, it is now believed that this disease is seen in all districts above 4000 ft.

As the name implies this disease is caused by the death of the phloem tissues due to the effect of the virus. This disease was confined to the higher elevations due to the fact that low temperature was conducive for the spread of this particular virus. In view of its occurrence in many high elevation estates, it would be prudent for the practical planter to have a background knowledge of the cause, symptoms and eradication/treatment of this disease.

Though this disease was not considered to be of economic significance in the past, in view of its presence in several districts, it should now engage the serious attention of not only the Tea Research Institute, but also of all Superintendents, as the cumulative devastating effect of the disease could pose a serious threat to the industry, if left unchecked.

Neither the virus causing this condition nor the vector transmitting this virus has yet been identified. It has not been possible to mechanically transmit this disease either. In the absence of any conclusive information on the identity of the virus or the vector, it becomes very difficult to suggest any treatment or cure for this disease. However, it is noteworthy that infection between plants (or bushes) is negligible or very slow.

The visual symptoms of the disease are :-

Stems

1. A typical zig-zagging of the green stems, which persists even after these become woody.
2. Shortening of the internodes.

Leaves

1. Sickle shaped curling outward of the leaves.
2. Dwarfing of the leaves.
3. Preponderance of banji and small flush.

The visual symptoms listed above are, by themselves, not conclusive evidence of the disease. As such it is very necessary to have a closer look for the real diagnostic character, which is the necrosis (death) of the phloem. There are many cases, where the bush looks perfectly normal but shows signs of necrosis, when examined by peeling the bark off.

Internal Symptoms

1. **Roots :** If the bark of the root is examined, the occurrence of dead zones of tissues, which are brownish in colour, would be noticed. The phloem in the brownish tissue is dead, hence the occurrence of the discolouration. It is important to note that the necrosis is not continuous, but occurs in irregular patches. Microscopic examination reveals brownish zones of dead phloem tissue.
2. **Stems :** Regions of discoloured dead tissue similar to that observed in the roots are found in the bark of the stems, though phloem necrosis in the stems is not as widespread as in the roots.

3. Leaves : The lower surfaces of the petiole and the midrib of the leaf are most convenient for the purpose of diagnosis of the disease. If the outer layers of cells of the midrib or the petiole are scraped away, a continuous brown region can be observed in necrotic bushes, where the phloem is discoloured. In extreme cases this necrosis may even spread to the main veins of the leaf.

Symptoms are mostly evident in tea recovering from pruning. This stands to reason, as the virus in the bush is now manifest in fewer shoots, and therefore the virus is more concentrated in these few shoots, which in turn show marked symptoms. It is also possible that multiplication of the virus is greater in the younger shoots.

As the bush recovers from pruning and adds on more foliage, the symptoms become less evident, but the bush itself is diseased and unthrifty. Due to the debility of the bush as a result of the death of the phloem in the plant, the tea bush eventually dies succumbing to the effects of pruning.

Treatment/Control

As no cure for a virus disease in any crop has yet been discovered, the only practical method of control of this disease is to destroy the virus by uprooting every tea bush that shows positive signs of the virus. In the absence of a curative solution to the problem, the only remedy, as it now seems, is to uproot all affected bushes and re-supply them with healthy clonal plants. Bushes afflicted by the virus could be identified at the time the field is recovering from pruning and a further evaluation could be made at the end of the pruning cycle, to determine the productivity of the bush. Once a bush falls below economic productivity levels, this by itself, is sufficient cause to uproot and infill, with a more vigorous growing plant.