Sandalwood Spike Disease

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- Sandalwood (*Santalum album*) – native to south Indian states of Karnataka, Tamil Nadu, Andhra Pradesh & Kerala – a hemiparasite with the roots of trees
- Known for its fragrant oil
- Suffers from spike disease – first reported by McCarthy (1888) from south India causes mortality of trees before they attain the productive age (heartwood formation) thus causing loss to exchequer

Symptoms

- Severe reduction in leaf size (in length & breadth)
- Shortening of the internodes causing crowding of the leaves giving rosette appearance
- Leaves stand out stiffly like spikes (phyllody) hence the name 'spike disease'
- Infected shoots give pendulous appearance to the spike
- Leaves turn yellow and develop a reddish tinge - Chlorosis
- With the progress of the disease leaves become smaller and smaller – 0.8 to 0.15 cm along length and breadth against normal leaf size of 7.5 by 2.5 cm
- In advance stage whole trees become spiked (witches' broom) and die within 1 – 2 years
- Affected branches produce new spiked leaves throughout the year and never bear flowers and fruits

Disease Symptoms

Causal organism - pathogen

- Earlier considered to be a viral infection but Electron microscopy proved that disease is caused by mycoplasma/ phytoplasma (Verma et al. 1969)
- Inoculation studies proved the causal organism of the disease
- Mycoplasmal cells found in sieve tubes and not in phloem parenchyma and companion cells

Disease transmission

- From diseased to healthy roots through haustorial connection
- By grafting
- Vectors – leaf hoppers *Moonia albimaculata* and *Jassus indicus*

Control measures

- Eradication – removal of infected hosts
- Selection of hosts –

  Azadirachta indica, Bambusa arundinacea, Cassia siamea, Casuarina equisetifolia, Dalbergia sissoo, Dodonea viscosa, Ficus benghalensis, Murraya konigii provide relative resistance

  Acacias, Cajanus cajan, Lantana camara, Pongamia pinnata render sandalwood susceptible to spike disease
- Chemical control – tetracycline group of antibiotics and benlate cause temporary remission of the disease however after few weeks the symptoms reappear
- Resistance testing – through selection of apparently healthy trees in a heavily disease locality and subjecting to transmission tests with sap inoculation