A NOTE ON WILLOW DISEASES IN PHANDER AREAS, GILGIT

Zakaullah*

During recent visits to the Northern Areas of Pakistan, three diseases of willows: canker, witche's-broom and shiny-black oily secretion incited by a bacterium, Mycoplasma-Like Bodies and aphids respectively were recorded. Bacterial canker was more common and damaging as compared with witche's-broom and aphids attack in Phander areas situated about 200 km north-west of Gilgit at an elevation ranging between 2286 and 2438 m. The important forest trees include willows and poplars. Three species of willows, i.e. *Salix purpurea, S. seriocarpa, S. tetrasperma* and a single species of poplar, *Populus nigra* (Lombardy poplar) were found commonly grown in the area. Nevertheless, a few hybrid poplars *(P. X-euramericana)* were also noticed around Phander Rest House. Willows are grown for fodder, basket-making, roof construction and for timber; whereas Lombardy poplar is a major timber species. Both the crops are raised vegetatively. A general practice with the locals is that they use willow cuttings (3.04 to 3.65 m long), obtained from the pollarded trees, for planting. The cut ends provide infection courts for many bacteria and decay fungi.

Many insects, fungi, bacteria, viruses and parasitic seed plants are known to cause damage to various parts of salicaceous hosts (Ahmad, 1956; Anon., 1979; Spaudling, 1961; Zakaullah, 1973). They have common pathogens throughout the world. The aforementioned diseases are described here to understand modes of infection and to suggest suitable remedial measures.

A. Bacterial Canker (*Xanthomonas populi*)

The disease can be a limiting factor in the introduction and cultivation of willows and poplars for industrial uses. In a great part of north-west Europe, it is a major disease of poplars.

Symptoms may vary with the host species, clone, ecological conditions and physiological state of the tree. The diagnostic signs include die-backof shoots, progressive canker formation on branches and trunks and ringing the buds. One of the most characteristic feature of the disease is the appearance in spring, and chiefly on one or two years old shoots, of a slimy exudate, whitish, changing afterwards to brown.

The pathogen enters the host through the cut ends, broken branches, traces of the stipule, bud scales and leaf scars. The evidence of the role of cambium borers as vectors for the internal spread of the disease in the tree has also been reported.

*Forest Pathologist, Pakistan Forest Institute, Peshawar.

To control the disease (1) propagation should be done through disease-free stock; (2) the cut-ends of the branches may be dressed with Bordeaux paste, B. paint or coal-tar immediately after cutting; (3) infested trees may be sprayed with Bordeaux mixture (4:4:5) or Perenox at 2 lbs/100 gallons of water; (4) investigations on the role of insects as vector may be carried out and (5) resistance studies may also be undertaken.

B. Witche's-Broom

The disease caused by MPLBs/virus was not common. The symptoms include excessive and premature development of buds leading to witche's-broom, reduction in leaf size, leaves becoming brittle and chlorotic, shortening of internodes and phyllody followed by decline/death of affected branches or the plant.

No permanent cure has yet been obtained. The measures suggested can help keep the incidence of disease below the economic level by (1) planting disease-free stock; (2) sanitation cutting of infected trees and (3) search for resistant or tolerant individual for future propagation.

C. Shiny-Black Oily Secretion

Sap-sucking insects cause two fold harm. Firstly, they de-sap the plants and weaken them. Secondly, their excreta being sugary help grow moulds on the foliage hence hamper photosynthesis.

The heavy infestation gives a shiny black look which is quite evident from a distance. Sometimes the stem and bark of branches or the soil below also turn black.

To control (1) apply 30-100 gm granules of Disyston, Temik, Lybaycid and Diazinon in the soil around the tree base in 1-2 m circle particularly to young plants and (2) spray 0.1 % dilution of Carbicon, Dimecron, Diazinon or Anthio.

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