

## Bacterial wetwood on ornamental trees

Wet wood (or slime flux) is a common condition on poplar, elm, birch, maple, apple, mountain ash and other ornamental trees. It is a disease described as wet wood. It is believed that wet wood is caused by some species of anaerobic soil bacteria, although the pathology of those bacteria is less investigated. The bacteria infect heartwood and then digest substances in the wood to release certain chemical components such as fatty acids, methane and carbon dioxide gases. Due to a hydraulic pressure, liquids come out of cracks in the bark, branch crotches, or pruning wounds, and then drip down the bark. At this stage, the condition of wet wood can be seen on the surface of branches or trunks of trees because the bark looks like water soaked. The soaked bark usually turns to light brown color and can be easily differentiated from normal bark (Fig. 1). Noisome odor and slimy appearance are common on infected branches or trunks. Some by-products generated by bacterial infection may attract other bacteria to colonize on infected wood and accelerate the development of wet wood syndrome. Excessive infection and colonization by bacteria will weaken tree growth or cause dieback of branches.

Bacteria that cause wet wood are very common in soil and water. They enter trees through root wounds. When oozing occurs on branches or trunks, the bacteria can be spread to other parts of trees through contaminated pruning tools or natural means such as insect feeding, rain splashing, etc. It is reported that some boring insects such as elm bark beetles transmit the bacteria



Fig.1. Superficial appearance of wetwood disease on a Siberian elm tree (*Ulmus pumila*).

There is no cure for bacterial wet wood disease so far. However, several measures can be taken to reduce the likelihood of bacterial infection or damage. In this area, drought and poor soil is a common condition that may increase wetwood problem, so it is important to ensure each tree receive enough water and balanced nutrients. When trees are growing normally, it is necessary to have trees inspected for any sign of wetwood problem. If wetwood condition is confirmed, a management protocol should be established to prevent

further spreading. Sometimes, a certain type of wetwood problem such as cambial wetwood can be easily managed by surgically removing infected bark tissue. To avoid cross contamination, it is always a rule to sterilize pruning tools by dipping them in 70% alcohol, 1% sodium hypochlorite (diluted bleach), or any other equivalent sterilizers. Since bacteria infect tree through wounds, it is always critical to maintain trees less wounded. Control any visible insects to avoid further spreading.