Ministry of Agriculture and Food

Dutch Elm Disease

June 2024

Dutch elm disease (DED) is caused by two species of fungi *(Ophiostoma ulmi* and *Ophiostoma novo-ulmi)*. It is transmitted from infected trees to healthy trees by at least three species of elm bark beetles. To date, no trees in British Columbia (B.C.) have been found infected with DED. Introduction of this disease would pose a significant threat to both the nursery industry and to landscape plantings of elm in the province. As one of the few areas in the world still free of DED, B.C. exports over 10,000 elm saplings annually.

Hosts

Elms (*Ulmus* spp.) are hosts of DED. American elms are the most susceptible. Siberian, Chinese and other elms are generally resistant but can harbour the disease. *Zelkova carpinifolia*, an ornamental tree in the elm family is also a host.

Distribution

DED is widely distributed around the world, including Western Asia, Europe, Canada (all provinces except B.C. and Alberta), United States, and New Zealand.

Symptoms

Symptoms of the disease first appear in June or early July. Leaves wilt, yellow and turn brown in the summer, often on one side of the tree (Figures 1A, 1B & 2A). This is followed by dieback of branches and eventual death of the tree. Brown staining can be seen in the sapwood of affected branches by peeling back the bark (Figure 2B).

Life Cycle

DED is transmitted from infected trees to healthy trees by the European elm bark beetle, *Scolytus multistriatus,* (Figure 3A) an introduced species which is present throughout Southern B.C. It can also be spread by the native elm bark beetle (*Hylurogopinus rufipes*) which is common in Eastern and Central Canada, but is not known to occur in B.C. DED may also be spread by the banded elm bark beetle (*Scolytus schevyrewi*), which was first detected in B.C. near Kelowna in 2010. The beetles breed in weakened trees in galleries constructed under the bark (Figure 3B). Galleries excavated by adult European elm bark beetles are parallel with the wood grain, a feature that can be used to distinguish this species from the native elm bark beetle.

In infected trees, the beetle galleries become colonized by the Dutch elm disease fungus. In the spring, a new generation of beetles emerge which spread fungal spores to healthy elm trees as they feed on branches. Beetle feeding introduces the fungus to the vascular tissue where the

fungus colonizes and clogs xylem vessels causing a vascular wilt. The disease can also spread by natural root grafting to adjacent trees. Long distance spread usually occurs through movement of infested elm firewood or logs. Movement of infected elm nursery stock could also introduce the disease to new areas.

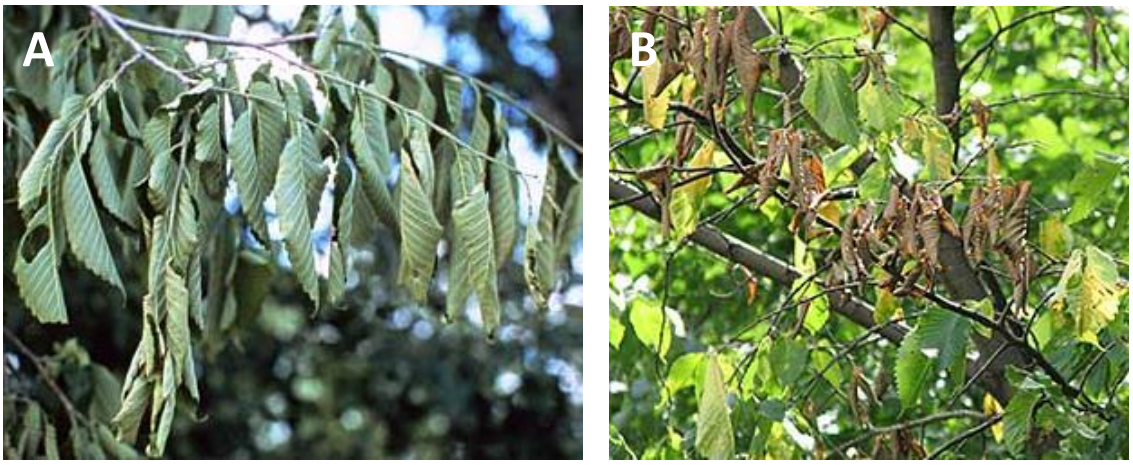

Figure 1. Flagging branches of an infected elm tree (A) and branch dieback (B). Photo credit: Dr. Gary Platford, Winnipeg, Manitoba (A), and Manitoba Agriculture, Food & Rural Initiatives (B).

Figure 2. Dieback and flagging caused by Dutch elm disease (A) and vascular discolouration under bark of infected elm branch (B). Photo credit: Dr. Gary Platford, Winnipeg, Manitoba (A) and Saskatchewan Environment (B).

Prevention

If planting elm trees, obtain nursery stock only from a local, reliable source.

A voluntary elm bark beetle management program has been developed to assist nurseries to prevent beetles from feeding and potentially transmitting DED to nursery plantings.

Early detection is the most important step to prevent the spread of this disease. If you spot symptoms of DED, contact the provincial Plant Health Laboratory for instructions on submitting a sample.

Many landscape and forest pests can be spread in firewood. Never transport elm wood or wood products with bark to new locations. Leave your firewood at home and pick up local wood when camping. Don't take extra firewood home with you.

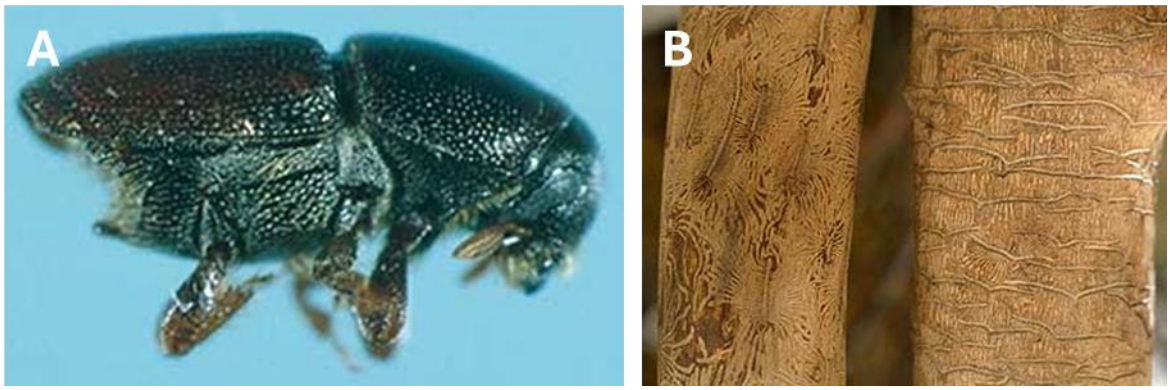

Figure 3. Smaller European elm Bark Beetle (A) and native bark beetle galleries, left trunk, and smaller European elm bark beetle galleries, right trunk (B). Photo credit: Thérèse Arcand, Natural Resources Canada, Canadian Forest Service (A) and Natural Resources Canada, Canadian Forest Service (B).

Disease Confirmation and Regulatory Action

If the disease is suspected, please contact the local CFIA office or B.C. Ministry of Agriculture and Food and submit suspected samples to the Ministry of Agriculture and Food - Plant Health Laboratory or to a federal (CFIA) plant diagnostic laboratory.

For Further Information

- Canadian Food Inspection Agency Policy Directive D-97-07, Policy on Domestic Movement of Elm Material to Prevent the Spread of Dutch Elm Disease within Canada

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