



Parks, Forestry & Recreation

Urban Forestry Branch

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Forest Health Care

Dutch Elm Disease

Dutch Elm Disease (DED) is the most devastating disease of elm trees in North America. It is caused by the fungus *Ophiostoma ulmi*. It attacks and blocks the water-conducting system of certain elm trees. Infection usually results in the death of the tree.

The fungus spreads from infected to healthy trees. It is transferred by two species of elm bark beetles that act as carriers of the fungus. Dead elm trees, elm logs and firewood serve as breeding sites for the elm bark beetles. Connecting roots between infected and healthy trees (root grafts) may also serve as conduits for transfer of the fungus.

Host and Damage

All of our native species of elms (American elm, red or slippery elm, cedar elm and rock elm) and some European species of elms (English elm and Scotch elm) are very susceptible to DED, however individual trees that are resistant are thought to exist. Asiatic species of elms (Siberian, Chinese and Japanese elms) are resistant.

In early summer, the leaves on one or more branches begin to wilt and curl, shrivel and turn brown. Later in the season, infection causes the leaves to turn yellow and wilt. Eventually the foliage throughout the entire crown wilts and the tree dies. Infected branch samples show brown streaking in the sapwood just under the bark.



symptoms at early stage



brown streaking in wood



wilting of leaves in early summer



symptoms at advanced stage

Specific Management Practices for Control of the Dutch Elm Disease:

- Early detection is very important to prevent the spread of the disease.
- Control of DED depends mainly on denying *elm bark beetles* places to breed. Quick removal and disposal of seriously infected and dead trees reduces the spread of the disease to other healthy trees. The recommended method of disposal is burial or burning. Tree care specialists should debark, bury or burn all affected stems greater than 1cm in diameter, and the stump should be cut flush to the ground.
- Where elms grow close to each other and root grafting is suspected, a trench approx. 60cm deep should be dug around infected trees to cut potential root grafts.
- Remove branches infected by DED fungus. If performed quickly and correctly on recently infected trees, the spread of the fungus to healthy parts of the tree can be prevented. It is recommended that the pruning cut be made at least 2m beyond (meaning closer to the ground) the stained part of the stem. Pruning tools should be disinfected between each cut using rubbing alcohol. For a large tree we recommend hiring a specialist.
- Prune back broken and dead branches, but do not perform general maintenance pruning during the growing season.
- Do not store elm wood as firewood.

General Management Practices to Improve Plant Health:

- Water your trees during dry spells. Infrequent, but deep soaking preferably during the early morning hours is recommended. Water absorbing roots are located in the upper 25 cm of the soil and extend outward well beyond the canopy dripline.
- Place organic mulch, (e.g. wood chips), or living mulch, (e.g. ground cover plants) around tree bases to keep the soil moist for longer periods and encourage healthier roots.
- Avoid unnecessary excavating, grade changes, soil compaction, root cutting or hard surfacing around trees. These activities destroy vital roots, which may lead to the decline or death of trees.
- Refrain from using salt or herbicides around trees.

Forest Health Care is a holistic approach to tree care that focuses on improving the health of trees in an urban environment. Our objective is a healthy, sustainable urban forest. Trees in urban forests are often stressed by compacted soil, drought, poor planting and pruning techniques, air pollution, road salt, damage from construction and much more. Trees planted in the right sites and properly maintained are less likely to suffer and are more resistant to pest problems.

Pest problems are managed using a decision making process that considers the following:

- Identification of the host and the pest.
- Monitoring of the host and the pest.
- Selection of the appropriate management strategy.
- Evaluation of the management plan.

Our focus is on pest management programs that are environmentally, socially and economically sound.