

Ophiostoma ulmi and O. novo-ulmi

Synonyms

- DED

Plant hosts

All *Ulmus*, *Zelkova*, and *Planera* species.

Symptoms

The symptoms of Dutch Elm Disease (DED) are typical of a vascular wilt disease. Symptom expression depends on how the tree became infected. If the tree was infected through insect vector transmission, symptoms start on single branches. Leaves become discolored and/or droop at the tip of the branch, with the wilt progressing from the branch tip inwards toward the bole of the tree. Leaves may then turn yellow or brown and fall off the tree or turn dull green and remain attached for several weeks. Trees that become infected through root grafts typically die soon after becoming infected, with wilt symptoms throughout the entire canopy.

The fungus clogs the vascular (water conducting) system of the tree. Browning of the water conducting vessels can be seen in cross-sections of the infected twigs and branches. Brown streaking in the direction of the wood grain may also be evident after bark removal. Symptoms begin in late spring or any time later during the growing season. Symptom progression throughout the tree can happen in a single season or may take two or more years.



Image courtesy of Majestic Tree Care

Transmission

The European elm bark beetle (*Scolytus multistriatus*) and the American elm bark beetle (*Hylurgopinus rufipes*) are known vectors of DED, and the most important means of dispersal. Both beetles are attracted to stressed, dying, or dead elm stems. The adult beetles tunnel into the bark and lay their eggs in tunnels (galleries) in the inner bark. The eggs hatch, and the larvae feed in the inner bark and sapwood. The larvae mature into adults and emerge from the elm wood. The spores of the DED fungus are eaten by or stick to the adult beetles as they emerge from the bark. The adult beetles then visit a healthy elm and infect the elm by introducing the fungus as they feed on or bore into twig crotches.

Tree to tree spread is accomplished through root grafts between neighboring trees. Roots of trees growing near each other often cross each other in the soil and eventually fuse (become grafted). Root grafted DED is a very significant cause of tree death in urban areas where elms are closely spaced.



S. multistriatus boring into twig crotch.



Beetle gallery courtesy of Dr. Vil.

DED can also be transferred long distances by the movement of infected logs that have not been debarked.

Geographic distribution

Dutch elm disease is present in North America, Europe, and west and central Asia.

Applicable regulations

A quarantine was established against Dutch elm disease and elm yellows (elm phloem necrosis) phytoplasma in November 1976 under [OAR 603-052-0114](#) to stop the continued spread of the disease.