



Extension

UNIVERSITY OF WISCONSIN-MADISON

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Dutch Elm Disease

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What is Dutch elm disease? Dutch elm disease (DED) is a lethal fungal disease of native North American elms. The fungi that cause DED entered the United States early in the 1900's on elm logs imported from Europe. DED now occurs throughout the United States and has led to the loss of the American elm as the premier street tree.



Dutch elm disease has led to the loss of the American elm as a street tree.

What does Dutch elm disease look like?

Wilting leaves, often on a single branch, are the first symptoms of DED. Yellowing of leaves and leaf drop follow. Trees may quickly lose all of their leaves, or trees may survive several years with an infection localized in a single branch. Infected branches often have brown streaks in the wood under the bark that follow the wood grain. This discoloration indicates where a tree's water-conducting tissue has been disrupted by the disease. Infected trees progressively decline and eventually die.

Where does Dutch elm disease come from?

DED is caused by two fungi, *Ophiostoma ulmi* and *Ophiostoma novo-ulmi*. These fungi are thought to have originated in Asia and were spread as elm trees and wood were moved from location to location. Once these fungi are introduced into an area, they are moved to healthy trees by two species of elm bark beetles (one native, one of European origin). These beetles breed in stressed trees (which include those trees suffering from DED), then carry spores of the DED fungi to healthy trees and inoculate the trees as they feed. Once DED fungi gain entry into an elm, they can move to other nearby elms underground via root grafts. Human activities such as pruning can lead to spread of these fungi as well.

How do I save a tree with Dutch elm disease? Elms suffering from DED should be removed. Prior to removal, disrupt root grafts between the infected elm and other nearby healthy elms using a mechanical trencher or vibratory plow. If you do not disrupt root grafts, removal of the infected tree may accelerate movement of DED fungi through root grafts to adjacent trees. Destroy wood from diseased elms by burning (where allowed by local ordinance) or burying it. If you decide to keep the wood, remove the bark, then pile the wood and cover it with a heavy tarp, burying the tarp edges with soil, until the wood is used. Covering the wood limits access by elm bark beetles that potentially could pick up DED fungi from the cut wood and move them to other trees.



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If you decide not to remove an infected elm, at least remove, then bury or burn, dead or dying branches. Make cuts six feet below any area showing symptoms. Disinfect cutting tools between each cut by treating them for at least 30 seconds with a 10% bleach solution or (preferably due to its



Discoloration of wood just under the bark of elm branches can indicate the presence of one of the DED fungi.

less corrosive properties) 70% alcohol (e.g., rubbing alcohol or certain spray disinfectants). If you use bleach, be sure to thoroughly rinse and oil your tools after pruning to prevent rusting.

How do I avoid problems with Dutch elm disease in the future?

Fungicide injections of either propiconazole or thiabendazole can be useful for protecting high value, healthy American elm trees. Such injections are of limited use if trees are already infected. For best results, trees should be treated every two years by a certified arborist with additional training in making injection treatments.

If you decide to plant an elm, use non-native hybrid elms, such as “Accolade”, “New Horizon”, “Regal” and “Frontier”, that are resistant to DED. DED resistant American elm varieties are also currently available. Look for varieties such as “American Liberty”, “Independence”, “Princeton”, “New Harmony” and “Valley Forge” at your local nursery or garden center. Keep in mind however that resistance is not immunity, and even DED-resistant elm varieties can become infected. Typically however, in resistant varieties, DED does not develop as rapidly, providing time and opportunity to attempt to manage the disease using other strategies (e.g., pruning, fungicide injections).

For more information on Dutch elm disease: Contact the University of Wisconsin Plant Disease Diagnostics Clinic (PDDC) at (608) 262-2863 or pddc@wisc.edu.

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A complete inventory of UW Plant Disease Facts is available at the University of Wisconsin-Madison Plant Disease Diagnostics Clinic website: <https://pddc.wisc.edu>.

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