



Dutch Elm Disease

American, Slippery (Red), English, European, and Winged Elm Trees



What is Dutch Elm Disease?

Dutch elm disease is caused by a fungus called *Ophiostoma Novo-ulmi*. This fungus grows only in elms. The disease is spread from infected trees to healthy trees on the elm bark beetle, *Scolytus multistriatus*, but it can also pass from one tree to another through root grafts.

Photo, top left: Do not infuse symptomatic elms or elms that will become infected through root grafts. The process will not be effective. **Right:** Foliar Symptoms of Dutch elm disease. **Below, top:** The elm bark beetle spreads the disease from infected to healthy elms. **Below, bottom:** Foliar symptoms of Dutch elm disease - wilting Foliage.



Biology

Dutch elm disease spreads from tree to tree in two ways.

1) Beetle spread of Dutch elm disease

Beetle infections start in the 2-4 year old twigs, where the beetle feeds and mates. The fungus rubs off the beetle and begins to grow in the tree in a downward pattern. Once it has reached the root flares, the fungus can spread to other trees through root grafts, as well as throughout the tree. The characteristic stain on the xylem of an elm infected with Dutch elm disease is caused by the tree producing gum-like substances, called tyloses, in an attempt to stop the spread of the disease. These tyloses cause the tree to wilt and die.

2) Root Graft Spread of Dutch elm disease

The other method of disease transmission between elms is through grafted roots. When elms are growing near each other their roots come in contact in the soil and graft together. The Dutch elm disease fungus can pass from diseased to healthy trees through these grafted roots.

Susceptible Trees

Most species of elms are susceptible including American, slippery (red), English, European, and winged. Less susceptible species include Siberian, Chinese, and cedar elms.

Signs and Symptoms

The first evidence of Dutch elm disease is wilting or "flagging;" leaves on the infected branches turning dull green to yellow and curl, becoming dry, brittle, and brown. The symptoms progress down the limb and eventually throughout the entire tree. If bark is peeled off of infected wood, the water conducting vessels will reveal the brownish staining caused by tyloses.



Dutch Elm Disease Treatment Strategies



Photo, above: Protecting elms at the Minnesota state capitol.

Although there are several ways to treat for Dutch elm disease, the best method is to prevent the fungus from infecting your tree. One application of **Arbotect**[®] fungicide can protect a tree for up to three years.

Treatment Strategies

Protecting with Arbotect[®]

The purpose of preventive macro-infusion with Arbotect[®] is to provide even and complete distribution of the fungicide throughout the 2-4 year old twigs, where the beetles feed. Trees should be treated after the leaves have fully enlarged or after the seeds have dropped. The treatments can be administered until there is fall color present in the canopy. Arbotect[®] does not work if the tree already is infected with Dutch elm disease.

Other Treatment Practices

Root graft disruption

Root graft disruptions involve physically cutting the roots shared by healthy and diseased trees through a process called trenching. This is most reliably accomplished mechanically with either a trencher or vibratory plow. Remove the diseased elm only after common roots have been disrupted.

Saving infected elms with tracing

Tracing is a method of saving recently infected elms, where diseased portions of the tree are removed. Although this process can be effective, only trained professionals should trace elms. Only the earliest stages of Dutch elm disease can be stopped using this method, and it still requires the use of fungicides. The most effective method of treating individual trees for Dutch elm disease remains to be preventative Arbotect[®] applications.

DIY Shopping List

Option 1:

Application Type – High Volume Macro Infusion

DIY Product/Equipment Needed

- Arbotect[®]
- High helix drill bits and drill
- High Volume Macro-Infusion Pump Kit
- Shovel and hand trowel
- Stiff bristled hand brush

