

# Dutch Elm Disease Encyclopedia Article

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# Dutch Elm Disease

Dutch elm disease is a fungal infection of the **vascular** system of elm trees. The fungus, *Ophiostoma ulmi*, is spread from diseased to healthy trees by elm bark beetles. Fungal spores adhering to the beetles are introduced to the tree through feeding wounds in young branches. In nonresistant elms, large portions of the vascular system are infected before the tree can defend itself against the invading **pathogen**. Water transport within the tree is blocked by the fungus and the tree eventually wilts and dies.

The fungus first appeared in the Netherlands about 1912; from there it spread across Europe, reaching the United States in 1930. At the time, the American elm, *Ulmus americana*, was the premier urban tree, planted for its beauty, shade, and durability. Across the Midwest, this hardy, quick-growing tree was used for windbreaks as well as on the streets of new towns. As the disease spread across the nation, streets once shaded by majestic, arching elms were soon barren of trees. It is estimated that over one hundred million trees have been lost to the disease.

Bark beetle tunnels revealed beneath the bark of a tree infected with Dutch elm disease.

Early attempts at controlling the disease concentrated on killing the fungus and its **vector**. As tree spraying became frowned upon and injection of fungicides more costly, more effort has been made to breed disease-resistant elms. Several European cultivars that have been developed are not completely resistant to the disease or sufficiently cold-hardy for North America. **Hybrid** crosses of resistant Asian species with American species lack the height and characteristic form of the American elm. Selective breeding and testing of American elms has led to promising varieties such as American Liberty, Princeton, and Valley Forge, but whether any of these will be resistant to the disease as the fungus itself evolves remains to be seen.

## See Also

Breeding; Interactions, Plant-Fungal; Interactions, Plant-Insect; Pathogens.

## Bibliography

Stipes, R. Jay, and Richard J. Campana, eds. *Compendium of Elm Diseases*. St. Paul, MN: American Phytopathological Society, 1981.