

whatever happened to the American elm? (and is it coming back?)

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Seventy years ago, the American elm tree (*Ulmus americana*) was the most street popular tree in the eastern part of the country. In the first half of the twentieth century, stately American elms lined the streets of Rhode Island towns — as they did throughout most of New England and most other urban areas of the eastern North America.

That was a magical time of picture-perfect Main Streets lined with towering native elm trees— before Dutch elm disease swept the country and nearly eradicated its native elm population.

In the 1950s and '60s, American elm trees across the country began to die, in initiating what the *New York Times* called “one of the worst ecological calamities” in U.S. history. America’s Main Streets and neighborhood parks were hit hard, in many cases rendered completely treeless because the only tree planted was the American elm.

It is said that Dutch elm disease has killed more than 100 million elms since it was introduced, in the U.S. as well as Europe. (England alone is reported to have lost 30 million.)

Rhode Island was not spared. By the 1970s, Dutch elm disease had killed all but



a few of the state’s American elms. For example, a 1953 survey showed that 93 percent of Providence’s trees were elms; by the late '60s, the majority of them were dead. Even the University of Rhode Island’s plant pathology experts were helpless in preventing the decimation of the campus’s elm trees, which were planted in 1888 when the school was founded and had majestically bordered the school’s renowned Quadrangle.

What is Dutch elm disease? And how was it able to reach epidemic proportions, devas-

tating the Ocean State’s—and America’s—elm tree population?

Dutch elm disease isn’t Dutch; it isn’t even European. So-called only because it was originally discovered in the Netherlands, Dutch elm disease is thought to be Asian in origin.

Like so many invasive species, the fungus that causes Dutch elm disease was imported as a consequence of global trade. It was introduced to Europe in the early 20th century and arrived in the U.S. in the late 1920s in a shipment of wood bound for the furniture industry. The disease affects all native North American elms and most European elms. Asian elm species are generally very resistant.

Caused by two strains of fungi, *Ophiostoma ulmi* and *Ophiostoma novo-ulmi*, Dutch elm disease infects and clogs the water-carrying systems of the tree, inhibiting the movement of water from the roots to the crown. In the absence of properly-circulating water, the tree wilts and eventually dies.

According to Bruce R. Fraedrich Ph.D., vice president of research for Bartlett Tree Research Laboratories, Dutch elm disease was able to spread virtually unchecked because American elms were a monoculture, especially in urban areas. Monocultures — the growth of a single species in a given area — are especially prone to eradication by disease. “Monoculture is the primary factor that favors the spread of the disease,” explains Dr. Fraedrich. “Elms were overplanted in many American communities. Once a tree becomes infected, the fungus can move rapidly between closely spaced elm trees.”

Dr. Fraedrich says that the disease is still a problem, but mostly in forests and natural areas. “Elms have a remarkable capacity for regeneration,” he says. “Once those street and landscape trees were lost to the disease, few elms were replanted, so the disease continues to exist at endemic levels

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particularly in natural environments.

“Dutch elm disease continues to be a major threat to elms because this species continues to regenerate in forests and natural areas.”

Because the disease is still a threat, owners of property with elm trees, particularly heavily forested properties, should be aware of its symptoms.

According to Dr. Fraedrich, Dutch elm disease causes wilting and browning of leaves on a single branch, usually in one section of the crown. “These symptoms spread fairly rapidly to other areas of the crown and can affect the entire canopy within a single growing season or less,” he continues. “Affected branches die soon after symptoms appear.”

Internally, the sapwood of diseased branches and stems are stained brown.

There is no known cure for Dutch elm disease beyond removing severely diseased trees. Otherwise, nearby healthy elms are at risk from the fungus. Fungicides that are injected into the tree’s root flare using special equipment can often prevent the disease. Dr. Fraedrich says that maintain-

ing a tree’s health of elms through proper pruning, use of soil nutrients, and proper irrigation during dry periods can reduce the potential for disease.

Proper maintenance can help prevent the disease and early diagnosis may help combat it, but most experts agree that the best way to win the battle against it is to plant disease resistant or tolerant elm varieties. Numerous varieties are now available, says Dr. Fraedrich, including the true American elm varieties ‘Valley Forge,’ ‘New Harmony,’ and ‘Princeton.’

‘Valley Forge’ has the best tolerance for Dutch elm disease but its form and structure is not as traditional as the typical elm. Dr. Fraedrich says that it is difficult establish and maintain a central leader in this variety, even with annual training. ‘New Harmony’ and ‘Princeton’ varieties have similar tolerance, with ‘Princeton’ having the best form and availability.

Other elms that are resistant or tolerant to Dutch elm disease include Accolade elm (*Ulmus japonica* X *wilsoniana* ‘Morton’), Triumph elm (*Ulmus* ‘Morton Glossy’), Frontier elm (*Ulmus* ‘Frontier’), Homestead elm (*Ulmus* ‘Homestead’), and Patriot elm (*Ulmus* ‘Patriot’).