

DUTCH ELM DISEASE

Your elms have it, you don't know how to treat it.
Though there's still no sure cure,
there are treatments that can help the fight.

by Roger K. Bowman, grounds supervisor, University of Delaware, Newark, Del.

Deciding how to set up a tree care program, or any grounds maintenance program, has to be a matter of economics. In the case of Dutch Elm Disease (DED), the economic problem many companies face is often limited to calculating the cost in removing dead trees, because there has not been an effective treatment program.

Today, despite attempts at remedies, there are still just three basic ways to treat the problem.

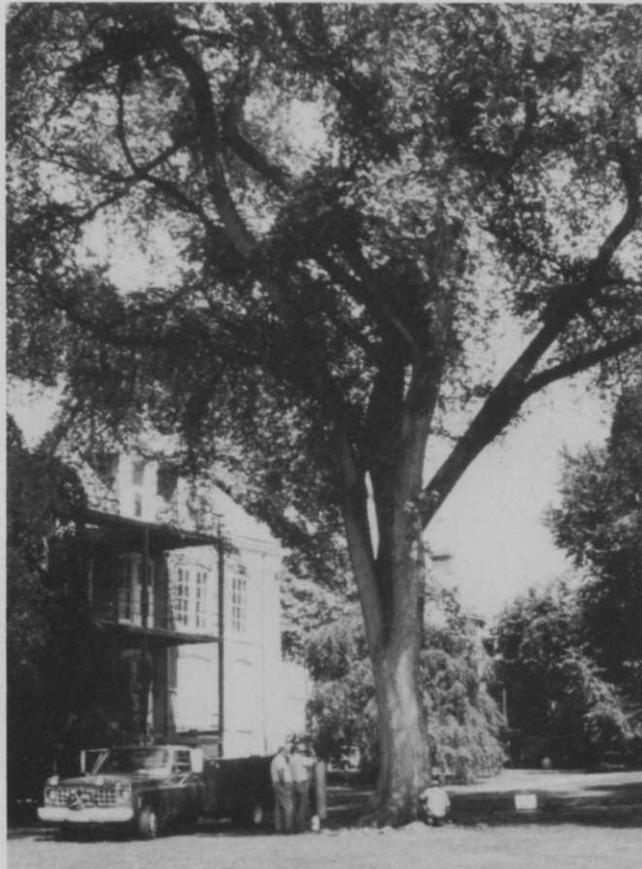
First, there's a do-nothing program, where you simply let the disease run its course, and remove trees as they die. While this might appear to be the cheapest way to go, a closer look at the costs may be revealing.

The minimum cost of removal is around \$500, more likely in the range of \$500-750. If the tree is in a difficult location—near buildings, power lines, or other structures where removal is complicated—then costs can easily run to \$1,000 or more.

Then there's the additional cost of losing a tree whose value may be considerable, depending on its size, shape, and location. The loss of a mature elm with a classic shape in a desirable location could be as much as \$10,000, using the estimating procedure outlined in the "Guide for Establishing Values of Trees and Other Plants," from the International Society of Arboriculture.

Minimum control

A step up is a minimum control program, where dead wood is removed on a regular basis to, 1) minimize spread of the disease, and 2) eliminate breeding grounds for the elm bark beetle that carries the fungus on its body from infected trees to healthy ones.



Saving American elms, like this large specimen and more than 100 on the University of Delaware campus, is one goal of the plant operations department.

In tree removal and in pruning dead wood, destroying the wood is extremely important, again to eliminate homes for elm bark beetles and larvae.

Along with deadwooding, a minimum control program should include injections with a fungicide, to control *Ceratocystis ulmi*, the fungus that causes the disease. One of the two fungicides labeled for DED is Arbotect 20S. Although this product was first introduced in 1977, a recent approval for a three-season rate, based on new research at the University of Minnesota, and a new injection technique, have made it more effective.

The product plays a significant role in the third option: a complete tree care program that includes sanitation and inspection, controlling beetles,

and planting trees to replace earlier losses.

The elm bark beetle

In early spring before the growing season begins, one should reduce beetle populations by spraying trees with an insecticide. A second spraying in summer prevents beetles from eating the leaves.

Trucks with elevated platforms are recommended to reduce the spraying distance by 50 feet and to reduce the amount of material needed by 50 percent or more.

At the University of Delaware, we participated in a research program (1975-80) on trapping elm bark beetles, developed with the assistance of Dr. Jerry Lanier at Syracuse.

When the project ended, the traps were not available for a couple of years. We relied on our spraying program and elimination of breeding sites.

From 1980 to 1983, we saw a significant increase in the number of trees lost to DED. Losses were less than 5 percent during the time

beetle traps were used, and it jumped to more than 10 percent when traps were eliminated. Fortunately, the traps did become available commercially.

Besides spraying, sanitation and inspection are a central part of some elm tree care programs. Sanitation involves deadwooding (removal and destruction of dead and dying elm wood).

Trees shouldn't be pruned during growing season, because beetles are attracted to the cut areas. However, any dead trees, and dead or dying branches on healthy trees, should be removed and destroyed, to eliminate both breeding sites for elm bark beetles and reservoirs of infection for the disease-causing fungus.



After soil has been removed to expose root flares all around the elm, university grounds crew members Douglas Lanham (right) and St. Clair McVicker drill holes and tap in injection tees. Tees are connected by tubing that connects to the tank containing fungicide mixed in the required amount of water. The fungicide is injected into the tree at 5-15 psi.

Tools are sterilized with a product like Lysol between each use to avoid transmitting the fungus between trees.

Inspection programs should be most intensive during the growing season, when trees should be watched daily for signs of "flagging," where a branch of the tree dies above a spot where beetles have been feeding, and the yellowing or dead leaves stand out like a flag amid the healthy green leaves.

If a dead branch is spotted, remove it immediately and make a visual check for infection. Peel back the bark. If the wood shows dark streaks, the disease is present. If there is doubt, you may want to send a sample to the county agricultural extension service to determine whether the branch died from the fungal disease.

A three-year rate

Success against DED can be achieved using Arbotect fungicide injections at a three-year rate. Trees are injected at three times the normal dose, and then not treated for the next two years.

This new method also involves excavation around the trunk and injecting into root flares using injection tees fed from a pressurized tank at 5-15 psi, rather than by gravity feed into tees placed above ground in the trunk itself.

At the University of Delaware, we

tested the method on six trees, two trees at a time. We saw no signs of flagging or other problems. A three-man crew, injecting three times a day, completed 44 of the most desirable trees, based on their shape, size, and location.

We found it best to divide elms into three classes and treat each class for one year. After three years, the first group will be ready for re-treatment.

Treating at three times the rate, but having to do it just every third year is advantageous from several points:

- It provides better protection because the fungicide moves into the new wood of the tree from year to year when used at the three-year rate.

- It's less damaging because there's no digging and drilling holes every year, so the tree has more time to recover.

- And, it clearly saves money.

For example, cost to inject 44 trees (labor, water, and fungicide) is about \$7,400 or about \$170 per tree. Prorated over three years, that's less than \$60 per tree. Saving a tree looks like a bargain, compared to the minimum cost of removing a dead tree.

Additionally, with expensive replacement, one must wait years for a young tree to develop.

A small four-inch diameter tree, including planting and a one-year guarantee, costs about \$1,200.

As further protection, you can also use chemical treatment in the soil to prevent root grafts between affected and healthy trees. Root grafts also can be controlled by cutting a trench about 18 inches deep between trees and severing any connecting roots. (In some areas, this technique can't be used because of so many underground utilities.)

Community checks

For further control, you might consider extending tree inspections into the community, both for homeowners and municipally-owned trees which might be afflicted with DED. If so, homeowners or city workers should be advised to contact a professional arborist.

It should be pointed out that chances of saving a tree with 10-15 percent of the crown affected are only fair, so the owner should consider whether to try to save it, and what the tree's appearance will be after removing the diseased sections.

If flagging is between 5-10 percent of the crown, chances are good, and 5 percent or less, then there's an excellent chance of saving the tree.

In all cases, you need 10 feet of uninfected wood below the cut you make to remove diseased portions. Then continuing care must always be performed.

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