

DUTCH ELM DISEASE CONTROL IN COLORADO

by John G. Laut

At the present time there is no known cure for Dutch elm disease once a tree has been infected. — Many people have claimed they have a cure for Dutch elm disease. However, none of these claimants have been able to present evidence that is recognized as valid by responsible plant pathologists. Until such time as the research teams develop a scientifically proven preventive or cure for Dutch elm disease, our efforts must be directed toward protecting our elms through vigorous application of the time-tested and reasonably effective program of spraying, scouting and sanitation.

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Mass. Forest and Park Association.

That statement is an echo of the advice of Schwarz in the very first paper describing Dutch elm disease in 1922, "I regard it advisable to immediately eradicate the diseased trees. . . . The spread . . . into the trunk may be prevented by an early removal of the newly infected parts." Fifty-eight years later (1980) we are still making the same recommendations!

What's new? The hottest topic today is injection of systemic fungicides into elms to prevent or cure Dutch elm disease. Rather than repeat the data that are in the recent literature I want to give you *my interpretation and opinion* of injection based on those data, personal discussion with the research people involved, and observations, over many years, of Dutch elm disease and various efforts to control it.

At present there are two different systemic fungicides registered by the EPA: a DuPont product — MBC-P, currently sold under a variety of trade names by various wholesalers (e.g., Correx by Hopkins) and a Merck material — TBZ with the trade name of Arbotect.

Present Colorado regulations restrict the use of these chemicals to applicators who have received specific training in Dutch elm disease (DED) injection techniques and for preventive treatment only.

I believe these restrictions to be justified since: (1) research has shown curative treatment to be marginally effective only when a small part of the tree is involved. In the majority of cases in Colorado visible symptoms generally are not discovered until that level is exceeded. Further research, better techniques and more intensive detection capabilities may eventually result in lifting that restriction; and (2) research results on various injection techniques are limited and the training requirement is the only way to ensure that operators use the best current recommendations.

The treatments are expensive. Minimum material and labor alone, for an average-sized tree, costs \$40; for larger trees, higher costs for labor and materials increase that figure substantially. Under some environmental conditions one treatment may provide protection for two years. For Colorado conditions it may be that we will require annual treatment.

Many people are concerned with the potential problems resulting from drilling many holes each year, over a series of years, into the main stems of our shade trees. There is mechanical injury. The threat posed by that injury is not yet clear. Injection holes, in some environments, can result in decay and biological damage. The threat posed by that biological damage is not yet clear.

There are many questions still unresolved with injection of fungicides for DED control — how much, how often, where, when and what happens? Until we have more answers, my recommendation is to consider injection only for *high value elms that have not been exposed to possible root-graft transmission* from nearby DED trees, *in areas where sanitation* is practiced to a high level of efficiency. That is a fairly weak recommendation for systemic injection of fungicides.

Another technique on the horizon is the use of pheromones (sex-attractants) to trap the insects that carry DED and thus prevent the spread of the disease. This technique is still in the research stage and unavailable for general use. The Colo-

Colorado State Forest Service and City of Fort Collins have cooperated with the U.S. Forest Service since 1975 in an experiment to test the effectiveness of this technique. We have caught a lot of beetles on the traps (2 to 3 million each year) but we have not seen a significant decrease in the incidence of DED in the city. We know the attractant is extremely powerful. We do not know what proportion of the total beetle population we catch. We do not know how many beetles we pull into the city from the rural areas. This technique needs more extensive testing before it can be recommended.

The use of insects that are parasitic on the lesser European elm bark beetle is another new approach. Colorado Department of Agriculture annually rears large numbers of the wasp, *Dendrosoter protuberans*, and releases them at various locations in the State. We have seen no positive effects from this technique.

There is still no better recommendation to control DED than sanitation. It can work; however, in many cases it apparently has not been effective. I believe that in those cases where failure was apparent, sanitation was in name alone. What do I mean by sanitation? Very simply, the removal and treatment of all elm material suitable for breeding by the insects that carry DED before it can produce a brood. Diseased elms, dead trees, dead limbs in otherwise healthy elms must be located, removed, and treated.

Two problems account for most of the failures of sanitation programs. (1) All the material is *not* adequately treated. Siberian elms (Chinese) are often ignored. Dead limbs are often left in trees. (2) Time is often ignored. In the growing season the European elm bark beetle can recycle (egg to new adult) in as few as 40 or 50 days. In addition brood wood can often be re-used and produce multiple "crops" of insects. A program that is based on "removal of diseased trees next winter" is doomed to failure. Sanitation must be prompt and must be based on early detection of diseased trees and all dead wood.

Can DED be controlled? I firmly believe that it can — by using present techniques. The Colorado State Forest Service and Cooperative Extension Service are presently taking part in a federally-

funded Demonstration Control Program. In five selected areas in Colorado, we are conducting intensive detection surveys. Every tree is examined at least four times each year for symptoms of DED and for potential brood wood. The areas at the same time are surveyed for stored elm wood suitable for beetle colonization. All symptomatic trees are sampled and laboratory tested for DED. All diseased trees and brood wood are disposed of in the most efficient manner before a new brood of insects can be produced. In the spring, elms in these areas are given a protective insecticide spray. Potential root-graft problems are treated.

Along with this work an extensive public education program has been initiated. Total cost is approximately \$400,000. The federal share is about 71 percent. Existing State appropriations for DED will contribute 16 percent and the cities themselves will pick up the remaining 13 percent.

Similar programs are being initiated in five other states around the country with the objective of demonstrating that DED can be controlled. We know how! We need to show how.

There are approximately 120 communities in Colorado where American elm is a significant component of the shade tree resource. As a result of our program approximately half (55) of these are conducting control programs based on aggressive sanitation (removing trees confirmed as having DED and other identified brood wood before a new brood of *S. multistriatus* can be produced). An additional 49 areas are working toward effective control, but have not yet reached the above standard.

Confirmed losses in 1979 (1,474) were less than 0.2 percent of the total elm population in these 120 communities. We believe that DED is being kept under control in Colorado.

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