

## Theories Vary on Cause of Dutch Elm Disease

As the situation of the vanishing American elm worsens and no "sure cure" has yet been developed, scientists studying the matter have come up with theories that may lead to new ways of combatting DED.

The disease, thought to be caused by a fungus carried by the bark beetle, blocks sap circulation until the tree dies of thirst. The bark beetle, however, doesn't appear to be the sole cause of spreading DED from tree to tree.

It is a peculiarity of the elm that its roots connect to roots of other trees of the species when they meet underground. This causes "sap transfusion" from one tree to the next, says Dr. Albert E. Dimond, chief plant pathologist at the Connecticut Agricultural Experiment Station in Mount Carmel. Bud cells of

fungus infection are transferred in this manner, even if trees are as much as 50 feet apart, Dimond says.

Thus, elms not only need to be guarded against bark beetle invasion but must be isolated from contact with roots of infected trees, according to Dimond. To achieve isolation, trenches three feet deep are dug around a tree and treated with a root-killing substance — such as Vapan — or the chemical is injected deep into the ground in areas of possible root contact, he says.

Another theory of DED transference has recently been developed by Dr. Rene Pomerleau of the Forest Disease Research Laboratory in Quebec. He has found evidence that the lethal action of the fungus occurs in the leaves and leaf stems of the elm, rather than in the main sap channel, as previously believed.

In leaves, the sap flows

through tiny channels of the sapstream, similar to the capillaries of the bloodstream, says Pomerleau. It is there, he believes, that fungus buds do the clogging, as was indicated by infested elms in the experimental station. Individual leaves were often partially brown and partially green, as if strangulation was taking place within the leaf itself.

One way to attack this is the injection of fungus-killing chemicals into the tree or the ground around it. Tests at the Connecticut station indicated that injection into the trunk can retard the disease for several weeks, but to date this has not achieved a cure.

In Holland, according to Dr. Dimond, progress has been made toward developing a strain of European elm that resists the fungus, but it does not grow into the vase-shaped pattern that is characteristic of the American elm of Christmas card fame.

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