

### TREE WOUNDS: NEW RESEARCH INFORMATION

Many trees die prematurely because of inadequate or improper treatment of their wounds. Much of it is due to lack of understanding of the decay process in trees and what needs to be done. Perhaps the time is near when it will be possible for that to change.

The science of tree pathology emerged from studies on decay almost a century ago. Many of the concepts developed then have changed little over the years. But a lot of additional information has been added to the basic story of decay and the new expanded concept is more complete.

"This new, more complete, concept gives us a better chance to regulate and control decay," according to Dr. Alex L. Shigo, plant pathologist, USDA Forest Service, Northeastern Forest Experiment Station, Durham, N.H., and Harold G. Marx, Research Applications, Staff Assistant, USDA Forest Service, Washington, D.C., in their recently published report, "Compartmentalization Of Decay In Trees," Agriculture Information Bulletin No. 405, which can be ordered by mail from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 for \$1.85.

The information in the Bulletin is based on 16 years of research by Dr. Shigo that involved complete dissections of approximately 10,000 trees, mostly deciduous hardwoods, at least 1,000 conifers, and 17 tropical species.

Previous research reports by Dr. Shigo have provided information on how to treat tree wounds.

A tree is considered to be wounded when its bark is broken so either its inner bark or wood is exposed to the air, Dr. Shigo has pointed out. When a tree is wounded, take these steps:

Remove dead and injured bark from around the wound with a sharp knife. Scribe wound in the shape of a vertical ellipse, if possible. Cut bark away from wound to form an interface of healthy wood and bark, even though this may enlarge the size of the wound.

Prune dead and dying branches to increase tree vigor.

Remove dead and fallen branches from the ground nearby. Such dead wood may harbor wood-inhabiting microorganisms that could infect wounds.

Thin out and remove less valuable trees nearby to reduce competition for nourishment in favor of the wounded tree.

Fertilize and water the tree properly to increase vigor.

Application of a wound dressing will not help the tree. Research has shown that the wound dressing provides no protection. However, if it will make you feel better, or you think the tree will look better, go ahead and do it.

The purpose of the present publication is to show how most columns of discolored and decayed wood associated with trunk wounds in trees are compartmentalized, the Bulletin says.

The Bulletin describes a system that makes it possible for forest managers to understand how most of these defects occur. There are 71 watercolor illustrations of what takes place, step-by-step.

When microorganisms invade tree stems through wounds, they do so in succession. Bacteria, nondecay fungi, and decay fungi are often intimately associated in their invasion process.

When microorganisms invade, they first surmount the chemical protective barriers set up by the tree and then move into the tree from compartment to compartment.

The wall formed by the cambium after wounding is the barrier wall. This wall confines the invasion to the wood present at the time of wounding. The new rings that continue to form are then protected from invasion unless new wounds are inflicted. When new wounds are inflicted at later times, multiple columns of defect develop.

Most trees receive many wounds during their lives. Every tree has some branches that die. When the branches are small and the wounds close rapidly, very little internal defect follows. But when large branches die and healing is slow, trouble starts for the tree.

When new wounds penetrate old columns of decay, the decay process proceeds rapidly in the new column.

"In summary, the compartmentalization of defects in trees is a survival system that is effective most of the time—not all of the time," the Bulletin says.

"And after the tree dies, the powerful decay processes continue to decompose the wood. The decaying wood provides nourishment for a wide variety of organisms. The decomposed wood provides nourishment for new trees."

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