

Dutch Elm Disease

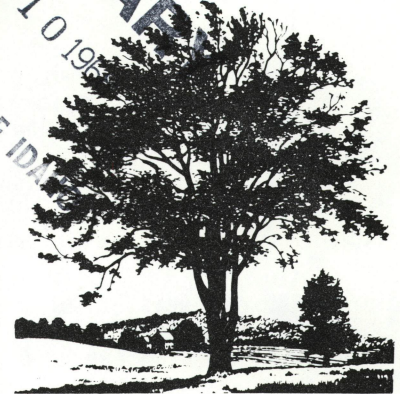
PREVENTION BY SANITATION

NOTE: Civic officials and community leaders are confronted with many questions when Dutch elm disease is found in the elm trees of their community. This publication is a reproduction of an Iowa State University pamphlet and discusses prevention by sanitation of Dutch elm disease in a suppression program. Other Idaho publications dealing with Dutch elm disease are available from your Extension Agricultural Agent's office or the University of Idaho Extension Service in Boise (83701) or Moscow (83843).

The spread of Dutch elm disease can only be suppressed when community action programs include strict sanitation of healthy elms, immediate removal and burning of diseased elms, prevention of disease transmission through root grafts, chemical control of the bark beetle vectors and the planting of replacement trees other than elm.

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Sanitation as a Dutch elm disease control measure is basically a public health program for elms. The goal is disease prevention. This is accomplished by eliminating the organism which causes the disease and by controlling the elm bark beetles which spread the disease. Dead and dying elm wood which has tight bark is the reservoir for both the disease fungus and the beetles. Sanitation is the removal and destruction of this wood.

Elms which are already dead or dying of Dutch elm disease are the primary source of the disease organism. As the fungus invades the vascular system of the tree, movement of water decreases. The tree becomes an attractive site for elm bark beetle breeding as the moisture content of the wood is reduced. Virtually all beetles which emerge from such breeding material carry the fungus on their bodies.

Bark beetles will infest any dead or dying elm wood which has tight bark. Female beetles entering this wood to breed may be contaminated with the disease fungus. The fungus will grow in the brood galleries, contaminating the emerging beetles.

SURVEYS

Surveys are an important part of the sanitation program. Each community should be surveyed for (1) current and potential beetle breeding sites and (2) elms which display symptoms of Dutch elm disease. The person making the survey should note the location of all dead and dying elm wood in the community. Woodpeckers often feed on infested wood during the winter, stripping off the outer bark and exposing the inner bark tissue. Wood attacked in this manner assumes a yellow or rusty-brown color and is easily detected by surveyors.

Sanitation is a year-round activity. Because the overwintering brood of bark beetles causes most of the disease spread, however, sanitation should be completed prior to beetle emergence in the spring. Normal maintenance (removal of broken, dying or dead limbs) of healthy elms is an extensive, costly operation. Most communities have adopted a 4- or 5-year pruning cycle. Situa-

tions such as storm damage may require immediate attention. For most pruning, however, the most practical program is to divide the community into sectors and carry out the required work in each sector in turn during a cycle of years. See fig. 1 for pruning instructions.

Trees killed by Dutch elm disease are the most important source of the disease fungus and elm bark beetles. Timing is important in a survey for trees expressing symptoms of the disease. Symptoms are usually most evident between June 15 and July 15. Symptoms of other elm disorders are at a minimum before July 1. Thus, surveys for Dutch elm disease symptoms are most accurate during this period. Early detection is particularly important in preventing root graft transmission of the disease.

The surveyor should check each elm in the community at least once during the survey. The recommended procedure is to survey one street at a time. View each tree from at least two sides. Large-scale maps are useful in keeping records of which trees have been surveyed. Aerial observations are helpful in locating symptoms in the tops of dense stands of trees.

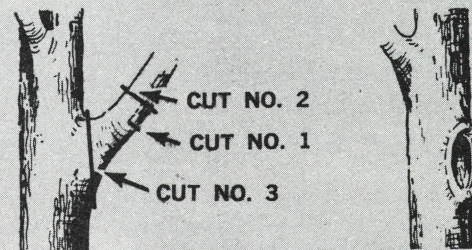


Fig. 1 PRUNING MATURE TREES

Use hand saws or lopping saws to prune dead or dying elm wood. Make each cut clean and as close as possible to the main stem. When removing larger branches, make the cuts in the order shown. Cuts 1 and 2 are made to prevent stripping of the bark. Make the cuts just above the bud when pruning small branches. Treat wounds 1 inch or more in diameter with an antiseptic tree paint.

DUTCH ELM DISEASE SYMPTOMS

Symptoms of Dutch elm disease vary with the type of transmission and the time of year. Beetle transmission usually occurs in the upper two-thirds of the tree's crown. Initial symptoms are a wilting of the leaves at the end of infected small branches. The leaves change in color to a dull grayish green, then turn yellow and finally brown, rolling up along the midrib as the colors change. Abnormally heavy leaf drop may accompany the color change. Symptoms gradually progress throughout the tree as it becomes infected by the fungus. Initial symptoms of root graft transmission may appear simultaneously throughout the tree. Leaves undergo a color change like that resulting from bark beetle transmission.

Both types of transmission will result in a brownish discoloration in the outer ring of wood beneath the bark of infected branches. This discoloration may appear as a streak running with the grain when the bark is peeled off, or as a ring of brownish dots when the branch is examined in cross-section. In some cases discoloration appears as a solid ring.

Trained observers can accurately identify diseased trees from wilting and discoloration symptoms until about July 1. Color change and wilting do not follow the same patterns later in the season, and may be confused with other elm disorders.

SAMPLING

Laboratory culturing of discolored wood from diseased branches is necessary for scientific diagnosis of the disease. Trained survey crews can accurately diagnose the disease from leaf and wood discoloration symptoms during May and June in areas where it has been present for several years. Other disorders which may cause similar symptoms are infrequent during this time, but become a major factor after the first of July. This culturing method of diagnosis should be reserved for

highly valued trees, trees from new areas of disease, situations where legal complications might arise, or use after the first of July.

The responsibility for collecting samples should rest with an official designated by the community. Four or five specimens are needed from each suspected tree. Cut 6 to 8-inch lengths from branches $\frac{1}{2}$ inch in diameter which show symptoms of wilt or color change and outer wood discoloration. Wrap the specimens in waxed paper or a plastic bag to keep them from drying out. Do not add moisture to the specimens. Send the samples to an officially designated laboratory for diagnosis. Include name of the owner, location, condition and previous history of the tree.

Keep a record of which trees were sampled. Tag each tree with an identifying number. Number each specimen with the same number as the tree it came from. Keep a running account of suspected elms, notification of owner, and disposition of diseased trees.

DISPOSAL

Elm wood must be disposed of to prevent its infestation by elm bark beetles. Two methods of disposal are recommended:

1. Burying at least 18 inches deep. This method is effective, but is seldom practical for large-scale operations.
2. Burning. This is the most economical means of disposal, particularly where large numbers of trees are concerned.

Select a disposal site within easy hauling range of the control area. Keep the site under strict supervision and control:

1. To assure orderly and timely disposal operations, preventing a pile-up of material awaiting disposal.
2. To prevent scavenging of elm for firewood.

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