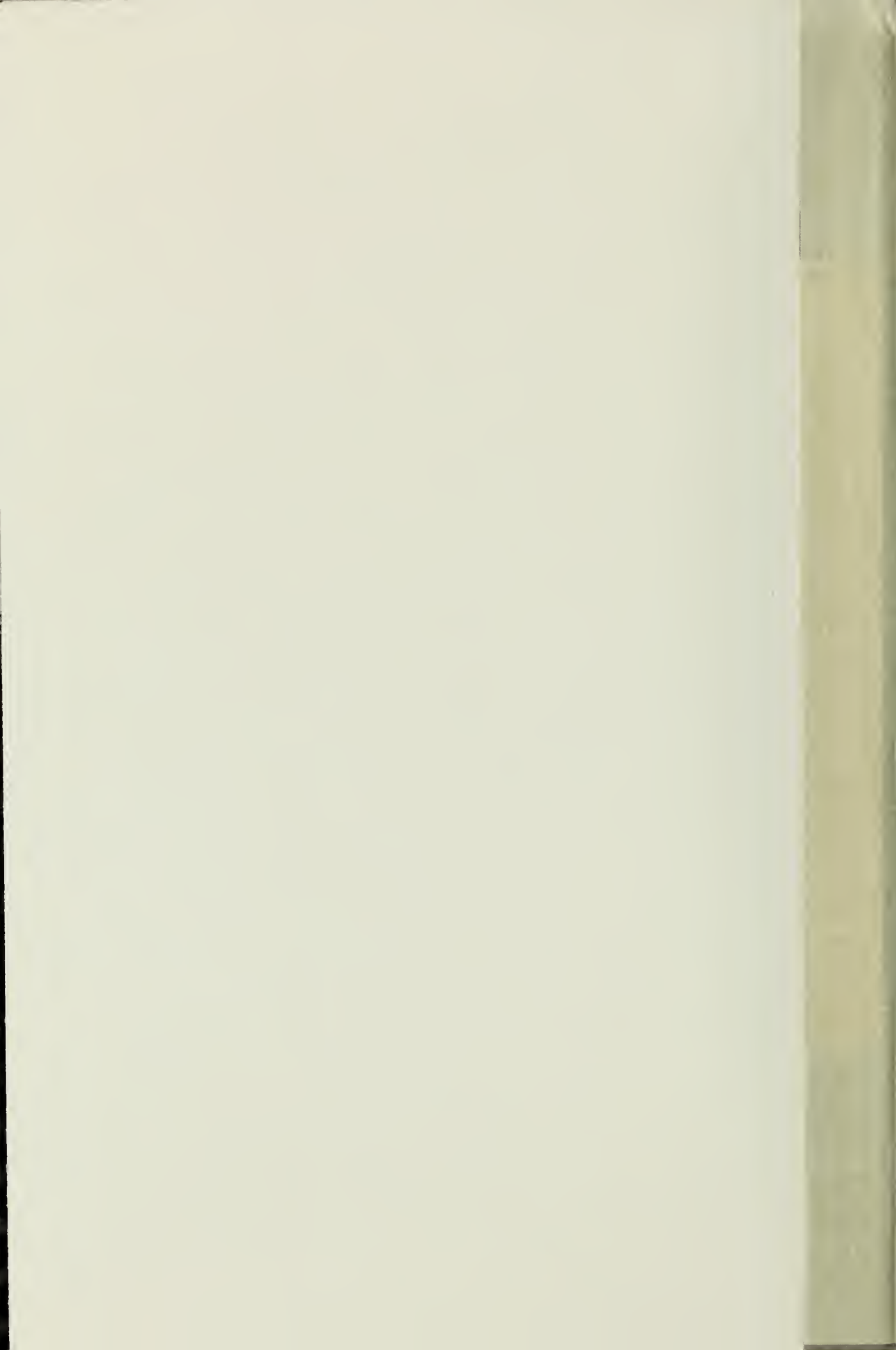


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# tree damage around construction sites

## diagnosing construction damage

Symptoms of construction damage to trees appear over a period of several months to several years after the damage occurs. This delay in the appearance of symptoms usually shifts the blame for construction damage to other causes after it is too late to effectively treat the trees.

The first symptoms are usually just a slight wilting and the shedding of some leaves at the time of construction. Then in later years leaf dwarfing, the dying of twigs, and, in the case of conifers, excessive dropping of needles occurs. Trees damaged by construction act abnormally in many other ways, most noticeably by dropping leaves early in the fall compared with trees of the same species in other locations. Early fall coloring usually accompanies early dropping of leaves. In cases of severe construction damage, off-season blooming occurs, and this usually means the tree is about to die.

In addition to noticeable physiological change in trees, construction damage produces other symptoms. If the tree has been only slightly damaged, growth is slowed and resistance to insects and diseases is weakened. Borers and aphids, both of which can do great harm, move in quickly after construction. These insects must be controlled quickly, or they will finish killing the tree.

Many diseases are soil borne and quite destructive, especially in compacted or filled soil where the water drainage pattern has been changed. Verticillium is the most prevalent and destructive. It can kill individual limbs or suddenly kill the entire tree. Canker and root rot are other diseases that occur after construction damage.

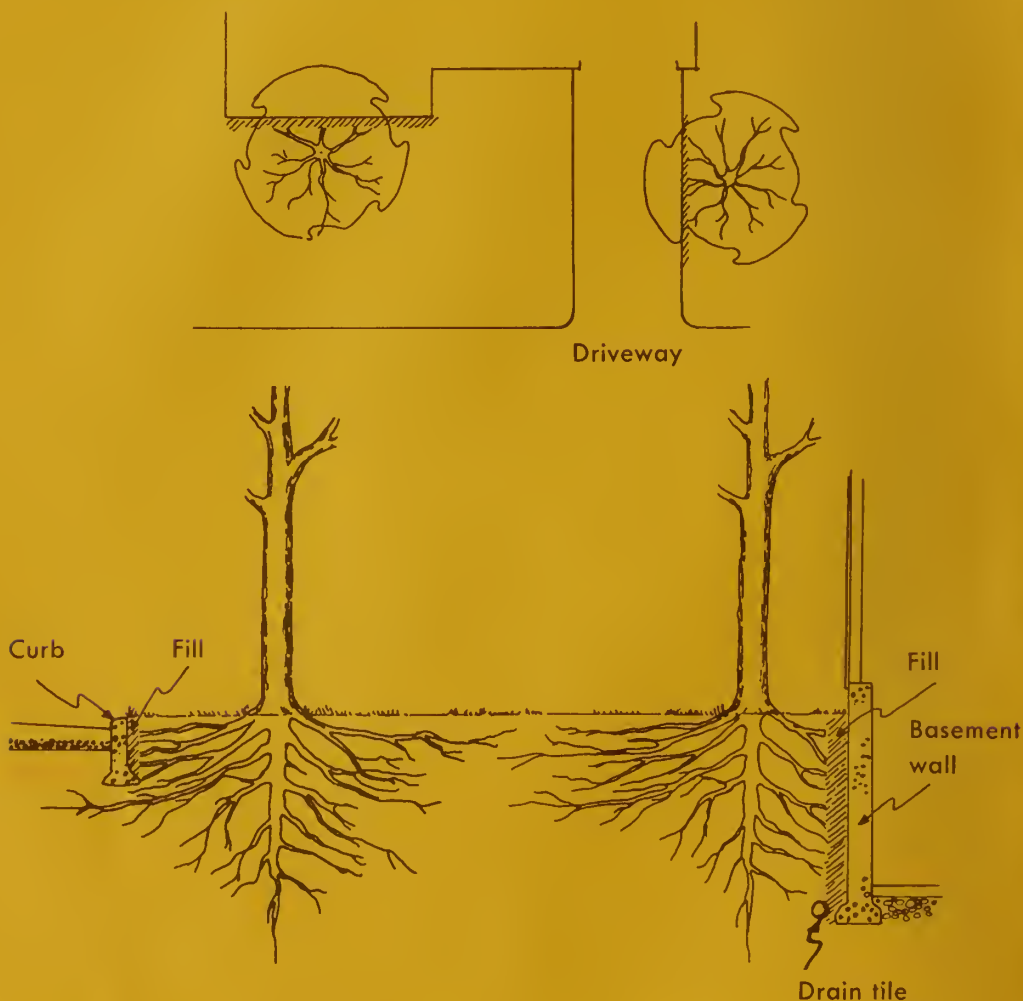
Diagnosing compaction or smothering damage can be difficult because it takes quite a while for symptoms to appear—often several years. Trees sometimes die five to seven years after the original damage. The amount of damage, the species of tree involved, and the soil type will determine how long it will take symptoms to appear.

Some species, burr oak and cottonwood for example, have deep roots and this gives them the ability to survive for long periods in compacted soils that do not have enough air to support other species.

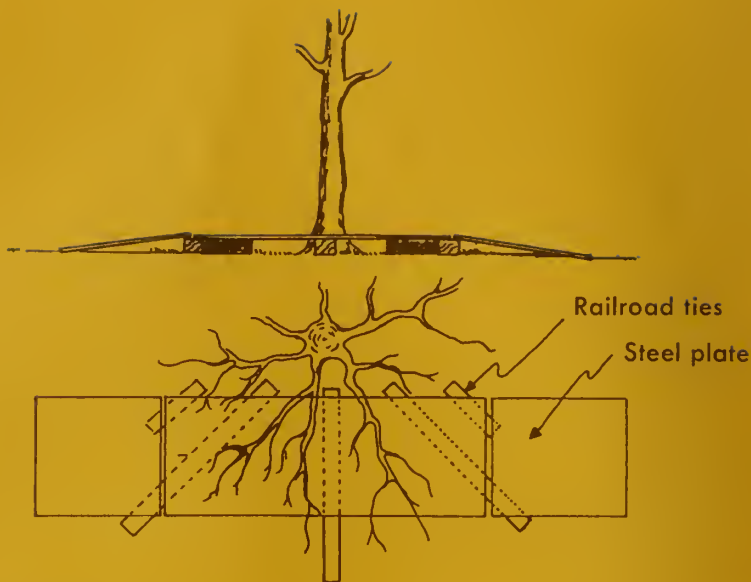
## control of damage

**Controlling traffic.** A basic means of reducing construction damage to trees is to reduce traffic as much as possible around the construction site. Talk this over with your contractor before construction begins. Establish definite traffic patterns and fence them off if necessary. Locate stockpile areas for soil and building materials well away from the drip line of trees you want to save.

**Caring for tree roots.** When you install temporary or permanent driveways or traffic lanes, cut nearby tree roots cleanly. Cleanly cut roots will heal well, and new roots will develop. Trenchers and backhoe equipment are most commonly used for such cutting (Fig. 1).



Various situations in which trenchers or backhoe equipment should be used to cut tree roots. Fill should be good top soil. (Fig. 1)



Bridging to protect tree roots.

(Fig. 2)

**Bridging.** Sometimes it is necessary for traffic to pass near to trees. In this case use bridging as illustrated in Figure 2.

**Watering.** Trees that have lost some roots and are in compacted soil usually need water.

**Pruning.** When you have pruned a tree's roots you should also remove a comparable portion of the top part of the tree. Do not pollard or cut off the top part of the tree trunk. Remove selected branches to the main trunk



A typical tree before and after thinning or pruning.

(Fig. 3)

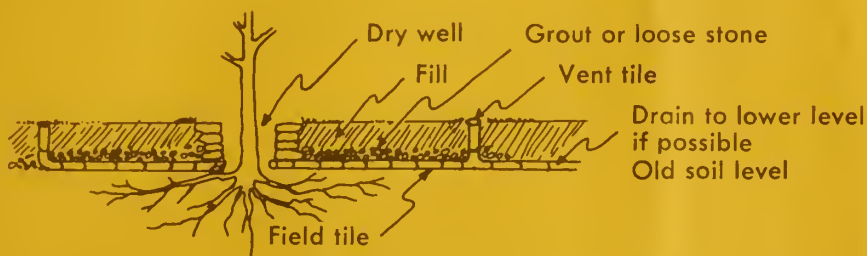


or to the crotch. Cut branches from throughout the tree to maintain symmetry (Fig. 3).

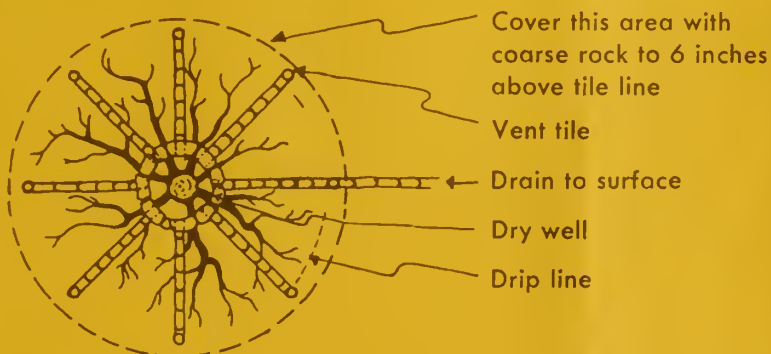
**Cutting and filling.** Cut-and-fill damage can injure trees just as much as compaction. The symptoms of the two problems are almost identical, only in most cases injury and death occur more rapidly from cut-and-fill damage. Figures 4, 7 (left), and 8 (top) illustrate three of the most common types of cut-and-fill damage. Figures 5, 6, 7 (right), and 8 (bottom) indicate the proper treatment in each case. Fill that covers the root system of a tree will smother it by cutting off its air supply and, sometimes, the moisture that the tree must have to survive.



Completely covering the area above a tree's roots (as shown above) will kill the tree. (Fig. 4)



Side view of proper tiling system to install when using fill dirt to raise the ground level around a tree. (Fig. 5)

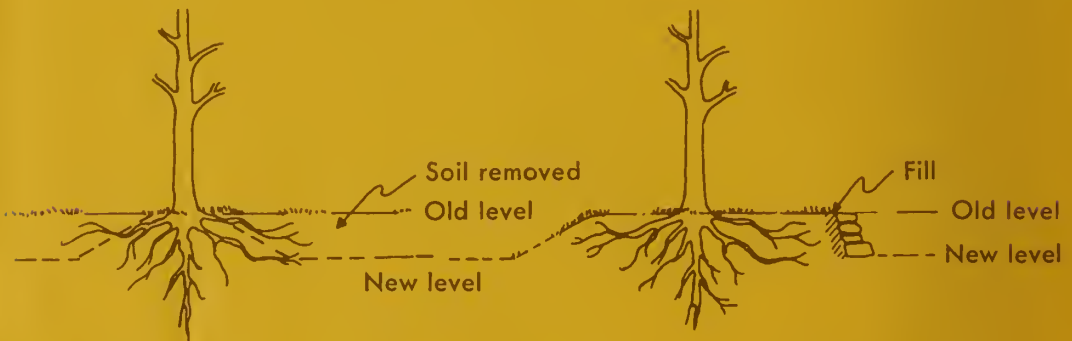


Top view of the drainage system of a tree located where the ground level is being raised by the addition of fill dirt. (Fig. 6)

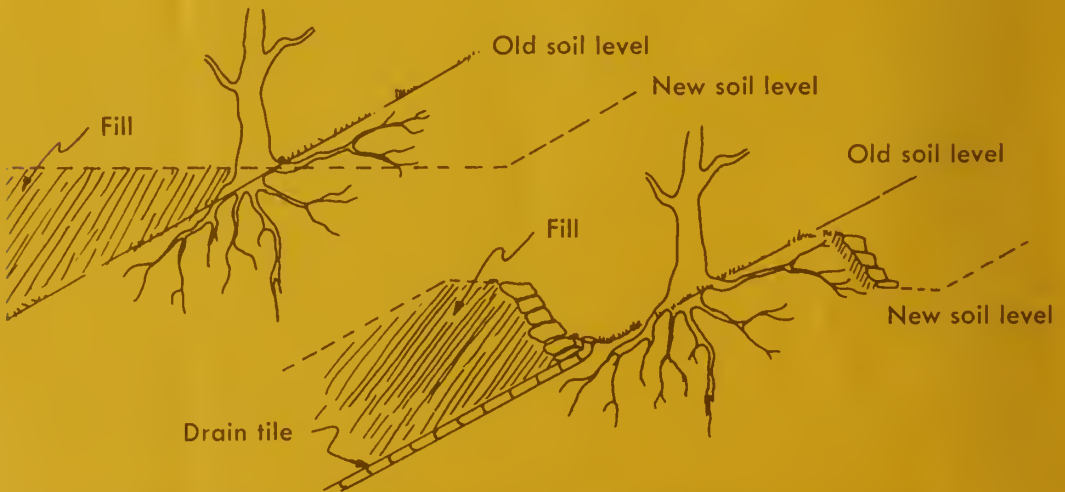


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If you want to place fill dirt over root systems, follow the procedure in Figures 5 and 6. Use the complete system for satisfactory results, since installing any one part of it will do little good. Use 4- or 6-inch standard agricultural field drain tile. Lay it in the pattern illustrated in Figures 5 and 6. Cover the tile with 6 to 8 inches of coarse  $\frac{1}{2}$ - to 3-inch stone. Use creek gravel, not crushed limestone which is commonly used for roadwork. Crushed limestone will harm the tree by raising the soil pH. The fill soil should be as porous as possible or amended with sand or organic materials such as corncobs. Sandy soil permits much more natural drainage of air and water than clay, which packs more easily. Two or three inches of sandy soil can be filled over a root system without harming the tree, while 2 to 3 inches of clay soil filled over a root system will kill the tree.



The drawing on the right shows the proper method to use when lowering the soil level around a tree in a flat area. The method used in the drawing on the left will harm the tree. (Fig. 7)



The proper method for protecting a tree from cut-and-fill damage is shown in the bottom drawing. The method used in the top drawing may harm the tree. (Fig. 8)

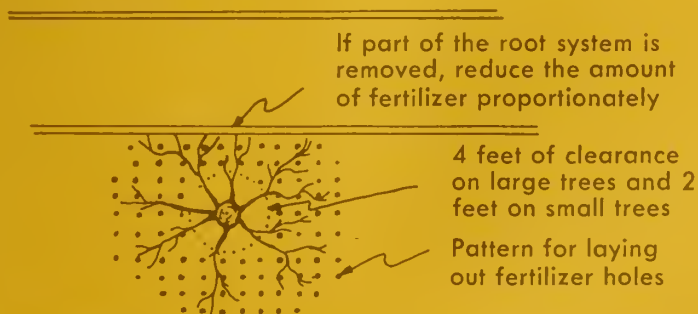
**Controlling insects and diseases.** Suggestions for controlling insects of shrubs and trees are included in Circular 900, "Insecticide Recommendations for the Homeowner." Insecticide recommendations are revised annually, so they were not included in this publication. Circular 900 may be obtained from your local Extension adviser.

## fertilizing trees

Use a good blended fertilizer, such as 20-10-5 or 10-6-4. Fertilize in November or early spring to stimulate new root growth and help the tree resist diseases and insects.

The best method of fertilization (Fig. 9) is to drill holes with a 2-inch soil auger 18 inches deep and 3 feet from each other. With small trees, 8 inches in diameter and under, start the holes 2 feet away from the trunk. With trees above 8 inches in diameter, start the holes 4 feet away from the trunk. For each inch of trunk diameter, extend the holes out 1 foot from the tree trunk.

For trees under 8 inches in diameter, when using a 10-6-4 fertilizer, apply 5 pounds of fertilizer per inch of trunk diameter (measured 3 or 4 feet above ground). Distribute the fertilizer evenly in the holes. When using a 20-10-5 fertilizer, apply 2½ pounds per inch of trunk diameter. For trees over 8 inches in diameter, double these rates. Thus, when fertilizing a tree 6 inches in diameter with a 10-6-4 fertilizer, you would apply a total of 30 pounds in the holes you had drilled beneath the tree (6-inch diameter  $\times$  5 pounds of fertilizer = 30 pounds total applied).



How to distribute fertilizer evenly under a tree.

(Fig. 9)

*This publication was prepared by Floyd A. Giles, Extension specialist in horticulture, and J. B. Gartner, professor of ornamental horticulture.*

Urbana, Illinois

August, 1972

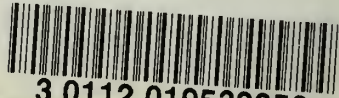
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