

Narrow trenches are dug in a spoke pattern around the tree, then backfilled with topsoil or compost. Root growth in the trenches will exceed root growth in the surrounding soil. A 2-4" layer of wood chips may also be added over the top of the backfilled trenches.

What about fertilization?

Most experts recommend that you do not fertilize your trees the first year after construction damage. Water and mineral uptake may be reduced due to root damage. Excessive soil salts can draw water out of the roots and into the soil. In addition, nitrogen fertilization may stimulate top growth at the expense of root growth. It is a common misconception that applying fertilizer gives a stressed tree a much-needed shot in the arm. Fertilization should be based on the nutritional needs of the trees on a site. Soils can be analyzed to determine whether any of the essential minerals are deficient. If soil nutrients are deficient, supplemental fertilization may be indicated. It is advisable to keep application rates low, however, until the root system has had time to adjust.

Monitoring for decline and hazards

Despite your best efforts you may lose some trees from the construction damage. Symptoms of decline include smaller and fewer leaves, dieback in the crown of the tree, and premature fall color. If a tree dies as a result of root damage, it may be an immediate hazard and should be removed right away. Examine your trees for signs of possible hazards. Look for cracks in the trunk, split or broken branches, and dead limbs. Watch for indications of internal decay such as cavities, carpenter ants, soft wood, and mushroom-like structures growing on the trunk, root crown or along the major roots. If you detect any defects or suspect decay, consult an arborist for a professional assessment. It is prudent to have your trees evaluated periodically by a professional.

You should also inspect your trees for signs of insects or diseases. Stressed trees are more prone to attack by certain pests. Talk to your arborist about putting your trees on a program of Plant Health Care (PHC). This may help identify and treat problems before they become a threat to the life of your trees.

For Additional Information

This brochure is one in a series published by the International Society of Arboriculture as part of its Consumer Information Program. You may have additional interest in the following titles currently in the series:

- Avoiding Tree Damage During Construction
- Avoiding Tree and Utility Conflicts
- Benefits of Trees
- Buying High-Quality Trees
- Insect and Disease Problems
- Mature Tree Care
- New Tree Planting
- Plant Health Care
- Proper Mulching Techniques
- Pruning Young Trees
- Pruning Mature Trees
- Recognizing Tree Hazards
- Treatment of Trees Damaged by Construction
- Tree Selection
- Tree Values
- Trees and Turf
- Why Hire an Arborist?
- Why Topping Hurts Trees



Developed by the International Society of Arboriculture, a non-profit organization supporting tree care research around the world and dedicated to the care and preservation of shade and ornamental trees. For further information, contact: ISA, P.O. Box 3129, Champaign, IL 61826-3129, USA www.isa-arbor.com

© 2001 International Society of Arboriculture

Printed in USA.

Recycled Paper
Recyclable

Treatment of Trees Damaged by Construction



The processes involved with construction can be devastating to the surrounding trees if no measures have been taken to protect them. The visible injuries such as broken branches and wounds to tree trunks are only the beginning. It is the damage to the root systems that often result in tree loss.

In an ideal situation, an arborist is called in to consult in the planning stages of construction. Trees can be preserved if the appropriate measures are taken soon enough. Unfortunately, it is usually when the first signs of decline appear that help is sought.

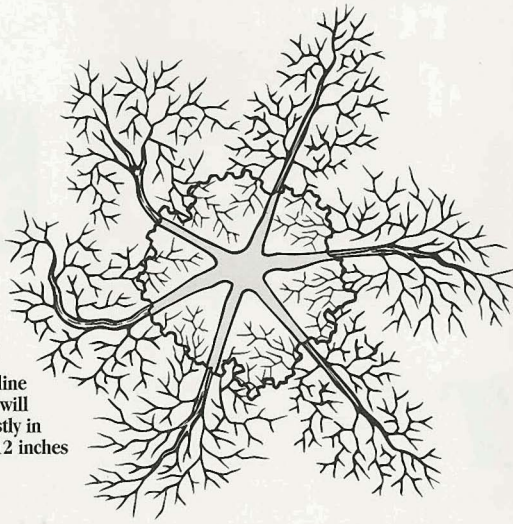
There are some remedial treatments that may save some construction-damaged trees, but immediate implementation is critical. If you have trees that have been affected by recent construction, consult a professional arborist promptly. Your arborist can assess each tree for viability and potential hazards, and recommend treatments.

Damage caused by construction

- Physical injury to the trunk and crown
- Soil compaction in the root zone
- Severing of roots
- Smothering roots by adding soil
- Split and broken branches
- New exposure to wind and sunlight



Roots extend much farther than the dripline of a tree and will be found mostly in the upper 6-12 inches of soil.



Inspection and assessment

Since construction damage can affect the structure and stability of a tree, your arborist should check for potential hazards. This may involve a simple visual inspection, or instruments may be used to check for the presence of decay. Sometimes the hazard can be reduced or eliminated by removing an unsafe limb, pruning to reduce weight or installing cables or braces to provide structural support. An often-overlooked method of reducing hazards is to move objects that could be hit, or to limit access to the hazardous area. If there is doubt about the structural integrity of a tree or the hazard cannot be adequately reduced, it should be removed. Although the goal is to preserve the trees whenever possible, that goal must not supersede any question of safety.

Treating trunk and crown injuries

Pruning • Branches that are split, torn or broken should be removed. Also remove any dead, diseased or rubbing limbs from the crowns of the trees. Sometimes it is necessary to remove some lower limbs to raise the canopy of a tree and provide clearance below. It is best to postpone other maintenance pruning for a few years.

Old recommendations suggest that the tree canopies should be thinned or topped to compensate for root loss. There is no conclusive research to support this practice. Thinning the crown can reduce the trees' food-making capability and may stress the tree further. It is better to limit pruning in the first few years to hazard reduction and the removal of deadwood. Do not top the trees.

Cabling and bracing • Trees growing in wooded areas are usually not a threat to people or structures. Trees that are close to houses or other buildings must be maintained to keep them structurally sound. If branches or tree trunks need additional support, a professional arborist may be able to install cables or bracing rods. If cables or braces are installed however, they must be inspected regularly. The amount of added security offered by the installation of support hardware is limited. Not all weak limbs are candidates for these measures.

Repairing damaged bark and trunk wounds • Often the bark may be damaged along the trunk or major limbs. If this happens, remove the loose bark. Jagged edges can be cut away with a sharp knife. Take care not to cut into living tissues.

Wound dressings • Wound dressings were once thought to accelerate wound closure, protect against insects and diseases, and reduce decay. However, research has shown that dressings generally do not reduce decay or speed closure, and rarely prevent insect or disease infestations. Most experts recommend that wound dressings not be used. If a dressing must be used for cosmetic purposes, use just a thin coating of a non-toxic material.

Irrigation and drainage

One of the most important tree maintenance procedures following construction damage is to maintain an adequate, but not excessive supply of water to the root zone. If there is a drainage problem the trees will decline rapidly. This must be corrected if the trees are to be saved. If soil drainage is good, be sure to keep the trees well watered especially during the dry, summer months. A long, slow soak over the entire root zone is the preferred method of watering. Keep the top 12 inches moist, but avoid over-watering. Avoid frequent, shallow waterings. Make sure surface water drains away from the tree. Proper irrigation may do more to help the trees recover from construction stress than anything else you could do.

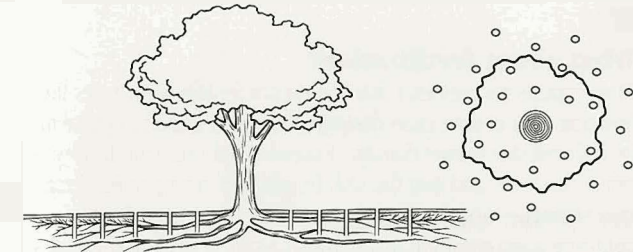
Mulching

One of the simplest and least expensive things you can do for your trees may also be one of the most effective. Applying a three to four inch layer of an organic mulch such as wood chips, shredded bark, or pine needles over the root system of a tree can enhance root growth. The mulch helps condition the soil, moderates soil temperatures, maintains moisture and reduces competition from weeds and grass. The mulch should extend as far out from the tree as practical for the landscape site. (If the tree had a say, the entire

root system would be mulched.) *Do not apply the mulch any deeper than four inches, and do not pile it against the trunk.*

Improving aeration of the root zone

Drilling holes/vertical mulching • Compaction of the soil and increases in grade both have the effect of depleting the oxygen supply to tree roots. If soil aeration can be improved, root growth and water uptake can be enhanced. The most common method of aeration of the root zone involves drilling holes in the ground. Holes are usually 2-4 inches in diameter and are made about 3 feet on center, throughout the root zone of the tree. The depth should be at least 12 inches, but may need to be deeper if the soil grade has been raised. Sometimes the holes are filled with peat moss, wood chips, pea gravel or other materials that maintain aeration and support root growth. This is called vertical mulching.



Holes are drilled throughout the root system to improve aeration.

Radial aeration • More recent research has shown promising results with another method of aeration called radial aeration. Narrow trenches are dug in a radial pattern throughout the root zone. These trenches appear similar to the spokes of a wagon wheel. It is important to begin the trenches 4-8 feet from the trunk of the tree to avoid cutting any major support roots. The trenches should extend at least as far as the dripline of the tree. If the primary goal is to reduce compaction, the trenches should be about 1 foot in depth. They may need to be deeper if the soil grade has been raised. This technique is appropriate for isolated trees, where the roots of other trees would not be damaged.

The narrow trenches can be backfilled with the topsoil or compost. Root growth will be greater in the trenched area than in the surrounding soil. This can give the tree the added boost it needs to adapt to the compacted soil or new grade.

Vertical mulching and radial trenching are techniques that may improve conditions for root growth. If construction damaged trees are to survive the injuries and stresses they have suffered, they must replace the roots that have been lost.