Root Problems

Nursery trees are often classified based on how they are produced, harvested, and sold. Each type of tree has a unique root system:

- bare root: no soil surrounding roots; usually on small trees
- balled and burlapped: roots of field-grown trees surrounded by soil and held together with burlap and wire or rope
- container: roots and soil in a container

Bare Root Stock

Bare roots should not be crushed, torn, desiccated, or discolored. The ends of the roots should be cleanly cut. Damaged roots may be cut cleanly prior to planting and watering.

Balled and Burlapped Stock

You should be able to see the trunk flare (the area where the trunk widens and connects with the roots) at the top of the root ball. Avoid buying plants with badly damaged or compressed root balls. The top of the root ball should be flat. Rounding may be an indication of major woody root loss.

The diameter of the root ball should be at least 10 to 12 times the diameter of the trunk as measured 6 inches (15 cm) above the trunk flare.

Container Stock

Roots should not twist or circle in the container. Remove the root ball from the container for inspection, paying special attention to larger, exposed roots. Circling roots may girdle and kill other roots or the entire tree if wrapped around the lower trunk.

Girdling root as tree matures

Fine circling roots may be cut away at planting. Larger roots may be straightened if still flexible. As with balled and burlapped stock, you should be able to see the basal trunk flare with container-grown plants. If the trunk flare has been buried, gently expose it before planting the tree, taking care not to damage the bark.

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

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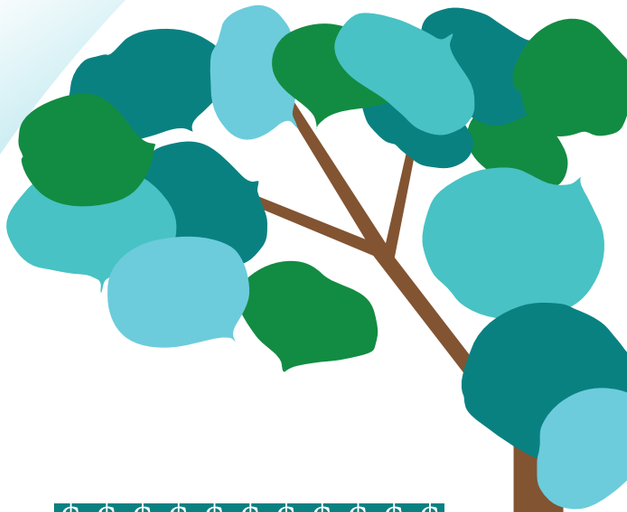
Buying High-Quality Trees



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Discover guidelines for determining tree quality at time of purchase and for identifying problems with tree structure, roots, and injuries.

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A high-quality tree, when planted and cared for correctly, may become a long-lasting asset to your property. In contrast, a low-quality tree may develop costly problems over time, increasing the need for maintenance and reducing the benefits a tree can provide.

What Determines Tree Quality?

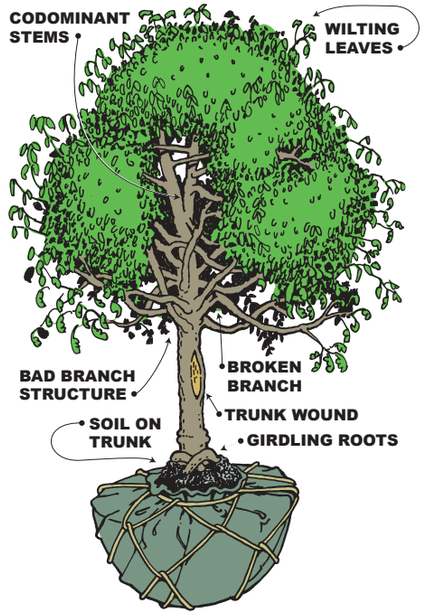
A high-quality tree has

- strong form with well-spaced, firmly attached branches
- a trunk free of wounds or damage
- a quality root system to support healthy growth

A low-quality tree has

- weak form in which multiple stems originate from the same point and branches grow into each other
- a trunk with wounds from handling or incorrect pruning
- limited, crushed, or circling roots in an undersized root ball or container

These problems, alone or in combination with each other, can greatly reduce the tree's prospects for a long, attractive, healthy, and productive life. When buying a tree, inspect it carefully to identify problems related to form, injuries, or roots (remember the acronym FIR).



Form

When buying a young shade tree, it is important to note that the branches you see may not be present at maturity. Many lower branches will be shaded out as the tree grows, or pruned away to allow clearance for pedestrians, traffic, mowing, or other activities.

Young trees often have few lateral branches, but branching increases with age. As a result, many nurseries prune young trees to increase crown growth. While giving a tree a fuller appearance, this practice may lead to issues that must be addressed later with corrective pruning measures.

Good, strong form—or architecture—starts with branches evenly spaced along the trunk. The branches should have firm, sturdy attachments with the trunk. Very upright branches with narrow angles of attachment may cause problems later on as they grow into the trunk. Branches that press against the trunk or each other can cause problems. Areas of contact may become compressed, crack, or die back. When several branches are growing at the same position on the trunk, the likelihood of weak attachments, compression, and cracks increases greatly.

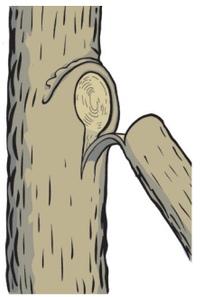
If you desire a tree with multiple trunks, make certain that the trunks are well separated at the ground line. Remember, trunks expand in diameter as they grow. Two trunks may be slightly separated when small, but as they grow in girth, the trunks will squeeze together.

Many architectural issues can be addressed through corrective pruning or training. Remove only broken or dead branches at the time of planting to allow the tree to recover from the stress of transplanting. After a year, start corrective pruning by removing any branches that died after planting. Space the pruning over several years.

Injuries

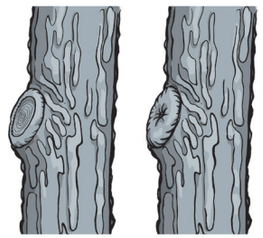
Never buy a tree without thoroughly checking the trunk. If the tree is wrapped, remove the wrap and inspect the trunk for wounds, incorrect pruning cuts, and insect injuries. Wrap can be used to protect the trunk during transit, but should be removed after planting.

Incorrect pruning cuts on the main trunk are major problems. Cuts that remove or injure the swollen collar at the base of branches may lead to problems, such as canker formation, decay, and cracking. Incorrect pruning practices that leave a stub prevent a tree from recovering from the cut.



Incorrect pruning cut: branch collar injury

A correct pruning cut removes the branch just outside of the collar. A ring, or "doughnut," of sound tissues then grows around the cut. Do not make cuts flush to the trunk. The closing tissues may form only to the sides of the flush cuts. Trunk tissues above and below flush cut branches often die. When high summer or low winter temperatures occur, cracks or long, dead streaks may develop above and below the dead spots.



Correct pruning cut: tissue closes evenly from all sides