

# Planting Landscape Trees

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The performance of a landscape tree depends a great deal on how it is planted. Survival after initial transplanting, rate of growth and establishment, root development, and many other factors can be improved by proper planting techniques. Topics to consider when planting include the size and shape of the planting hole, whether to add soil amendments or fertilizer, pruning, staking, mulching, and watering.

## PLANTING HOLE PREPARATION

Plant a young tree “high,” whether it is bare-root, balled, or container-grown. Dig the hole no deeper than approximately 2 inches (5 cm) less than the depth of the soil in the container or the depth of the soil ball. Planting a tree too deeply or in loose soil may lead to the root ball settling below grade and potential crown rot problems.

Soils compacted by construction, vehicular traffic, or agricultural use must be broken up before planting to ensure adequate air and water penetration. After loosening compacted soil using a shovel or excavation equipment, irrigate thoroughly and delay planting for 2 weeks to allow the soil to settle. An evaluation of the soil drainage should be completed prior to planting. Dig a hole at the planting site and fill with water. The water should drain through the planting hole within 24 hours. If not, more extensive soil modifications may be necessary.

In soils of reasonable tilth, the planting hole should be at least twice the diameter of the container or root ball. In more compacted soil, the hole should be three to four times the diameter of the root ball. In either case, the sides of the hole should slope slightly in toward the bottom and should be roughened to allow easier root penetration. When planting bare-root trees, make the hole large enough to accommodate the roots without crowding. Backfill the hole with soil dug from the hole, or use more friable surface soil if the soil from the hole is mainly hard clods. With container-grown trees, take care to not cover the root ball top with soil because the finer-textured backfill soil can prevent the root ball from being wetted (fig. 1).

In order for a tree to grow well as it matures, its roots must grow into the soil of the planting site. Amending the backfill soil merely creates an artificial container through which the roots must grow. Limited research has found no benefit from backfill amendments.

If the soil at the planting site will not satisfactorily sustain a tree, extensive conditioning and modification of the entire rooting area would be needed, but this is seldom practical. Roots grow and develop in moist soil where oxygen is available. Roots grow little or not at all in dry soil, in compacted soil, or in soil that is saturated. Trees will have shallow roots if planted on shallow soils that have impervious layers or an underlying shallow water table.

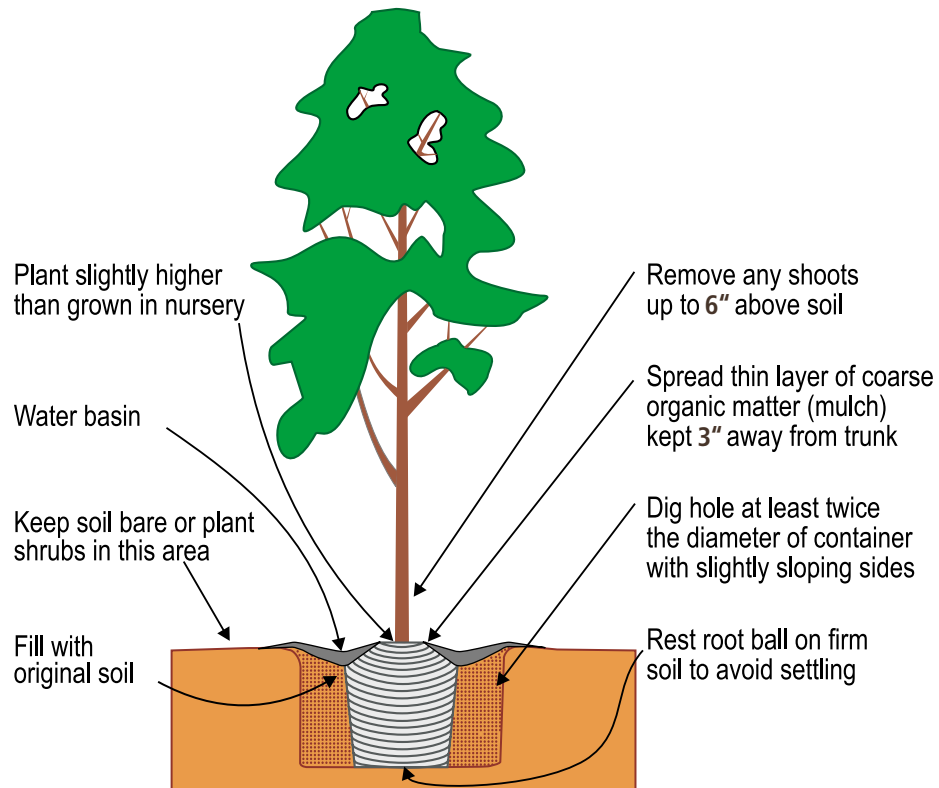


Figure 1. Proper planting of a container-grown tree.

## FERTILIZING

Adding fertilizer, soil amendments, or root stimulants to the planting hole or backfill soil is not recommended. Most nursery-grown trees are well fertilized during production and seldom respond to fertilizing at planting except in the most infertile soils.

## PRUNING

The less a young tree is pruned, the more total growth the tree will make. However, the growth may not be where you want it or where it will develop the most desirable tree structure. After planting, remove broken, dead, or diseased branches and branches that interfere with more desirably placed ones. Remove or cut back branches that will compete with the central leader (the topmost shoot). Leave small shoots along the trunk below where you want the lowest permanent branch; remove large low branches or cut them back to two or three buds. These low shoots will protect the trunk and increase its strength. Check the tree every 2 to 3 weeks during the growing season to see how it is doing; direct its growth by pinching back shoots that are too vigorous or shoots that you will not want later.

## STAKING

Newly planted trees may need staking for protection, anchorage, or support (fig. 2). The type of staking depends on the landscape situation and the ability of the tree to stand upright. The more freedom to move the top of a tree has, the better it is able to develop structure to stand upright and withstand storms. Stakes are not necessary for trees that can stand by themselves or are planted where little or no protection is needed. Most conifers, trees with upright growth habits, and trees planted bare-root usually do not need support.



**Figure 2.** (A) Valley oak tied and staked too high. (B) Stakes and ties properly adjusted.

Stakes should not extend too high into the tree canopy, where they can injure the lateral branches; injured branches can be infested by insects or infected by pathogens. Stakes should not be higher than necessary to hold the tree upright while allowing the top to move in the wind. To find the correct height, grasp the trunk with one hand and bend the top. If the top returns to its upright position when released, tie the trunk at that height. The tie should provide some flexibility but should prevent the trunk from rubbing against the stakes. Tree stakes should be removed as soon as the tree has rooted well enough for support. In most cases, the stakes should not be left in place for more than 1 year.

**Protective stakes** are needed for trees that can stand without support but that need protection from equipment, vehicles, or animals. To protect trees from equipment and vehicles, stakes need only be high enough to be seen, so as not to be a tripping hazard. Three taller stakes with wire mesh or other covering may be needed to prevent animal damage.

**Anchor stakes** are needed for trees whose trunks can hold the trees upright but whose roots may not be able to support the trunks, particularly in a wind when the soil is muddy. Stakes used for protection are usually tall enough for attaching ties to the tree trunk to anchor the roots securely and still allow the top to move in the wind.

**Support stakes** are required for trees unable to stand by themselves. Top support for these trees should be as low on the trunk as possible but high enough to return the tree upright after deflection. Use two or three support stakes. Tie the trunk to them at only one height to allow the trunk below the tie to bend in the opposite direction from the top during a wind. Tie material should contact the trunk with a broad, smooth surface and it should be elastic enough to minimize trunk abrasion and girdling.

## COMPETITION FROM TURF AND WEEDS

When trees are planted in a turfed area, keep the turf or other vegetation at least 12 inches (30 cm) away from the trunk of young trees for at least the first 2 years. The growth of young trees may be retarded by turf growing close to their trunks, even though additional water and fertilizer are applied (fig. 3). A 2-foot-diameter (60-cm) area of bare soil, or an area of mulch, around the tree trunk will also reduce damage to young trees by lawn mowers. Mechanical damage to the trunks of young trees can have a severe dwarfing effect.

## WATERING

The basin for watering a newly planted tree should be constructed so that water will drain away from the trunk. Even if the soil is moist at the time of planting, thoroughly irrigate the tree to settle the soil around the root system. Remember that most of the root volume occupies a rather limited area, particularly through the first growing season. During this early period, lighter and more frequent watering than what is recommended for established trees is needed until the roots grow into the parent soil. One or two irrigations per week during high water-use periods may be desirable. If the parent soil is poorly drained, be careful not to overwater the tree. Once established, thorough, infrequent irrigation around the “dripline” (ends of branches) is most beneficial for good tree growth.



**Figure 3.** Maintaining an area of bare soil around young trees prevents other vegetation from competing for water and nutrients. The growth rate of the oak tree at left, planted in a 9-square-foot (0.8-sq-m) area of bare soil with sprouting weeds controlled by herbicide, surpassed the growth of a similar tree grown in turf (right). Both trees were planted as 1-year-old-liners in tree shelters.

## FOR MORE INFORMATION

You'll find more information on planting and care of fruit trees in the following ANR publication:

*California Master Gardener Handbook*, Publication 3382.

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