

## Planting a Tree

### Before you plant . . .

#### Choose the right site

Before you dig, determine exactly where to plant the tree. Look up, down, and around. Know the mature height and branch spread of the tree to avoid future problems. If information on mature branch spread is not available, it can be estimated from the mature height. Many round-headed trees grow as wide as they grow tall. Overhead utility lines, eaves of roofs, or structures should not be directly above the growing area, unless the tree is very small at maturity (less than 15 ft).

Keep trees with a mature height and spread of more than 15 ft at least 15 ft away from utility lines. Those that are 30 ft tall at maturity should be planted 30 ft away. Do not plant too close to surrounding objects, including the house, other trees, and other structures. Tree roots spread beyond the branch area of the tree, and may crack sidewalks, paved areas, walls, and foundations. Be sure that the mature tree will fit the site. It is not practical to plant a tree that will outgrow its space, planning to continuously prune and top the tree to keep it small. This is an expensive plan, doomed to failure. Change either the site or the tree. Just as important, the soil area must be large enough to accommodate the rooting habits and mature trunk diameter of the tree.

Locate underground utilities before digging. Large trees should not be planted on top of underground lines, because they may crush the conduit. Ideally, trees should be planted half the mature crown width away from underground lines. For example, if a tree has a mature crown width of 15 ft, it should be planted at least 7 ft from the line. You are responsible for any damage and repair to below-ground utilities resulting from planting. Trees planted near underground utility lines risk root damage if lines must be dug up for repair work. Call all

of the utility companies in advance to request free underground utility location services. Remember to contact *all* utility companies, not just the ones that supply your household.

#### What's the soil like?

The second step in planting a tree is to determine the type and quality of the soil and amend it if necessary. Tree health and growth depend on how the tree's roots and the soil interact. Roots obtain water, oxygen, and nutrition from the soil. The availability of these essentials is determined by soil type, texture, depth, and structure.

The "ideal" soil is loose, moist, easily worked, and readily penetrated by roots. Spaces between soil particles, known as soil pores, hold both water and air. The amount and size of the pore spaces vary with the type of soil particles (sand, silt, or clay). Knowing the soil type helps determine if amendments or additions are necessary before planting.

Most of Hawaii's soils are clay-like or, in coastal areas, sandy. Sandy soils have good aeration but low water-holding capacity. Incorporating organic matter (about 25% by volume) increases the water-holding capacity. Clay soils hold water well, sometimes too well—they may be poorly aerated and have poor drainage. There are no cures for excessively clayey soils. The special planting techniques for poorly drained soils described later will help tree survival and growth.

Having the soil analyzed will determine soil pH, the amounts of major nutrients available to plants, and soil salinity. Soil analysis should be done especially if other

plants in the landscape are having problems. Low-cost soil analysis services are available from the University of Hawaii's Agricultural Diagnostic Service Center (through your local UH Cooperative Extension Service office) or from commercial soil testing labs. Do-it-your-

**Check before you plant—Who to call to locate underground utilities:**

Electric and power companies  
Telephone companies  
Cable television suppliers  
Gas companies  
Board of Water Supply  
Consult your telephone directory for the phone numbers in your area.

self soil-test kits are sold in garden-supply stores.

Check the soil's drainage with a percolation test. The rate at which water drains through the soil affects tree survival and growth and is important in tree selection. Poorly-drained soil can result in too much water in the root zone, which may be fatal to the tree. Dig a hole 1 ft deep, fill it with water, and see how long it takes to empty. If the water level drops more slowly than 1 inch per hour, drainage is poor.

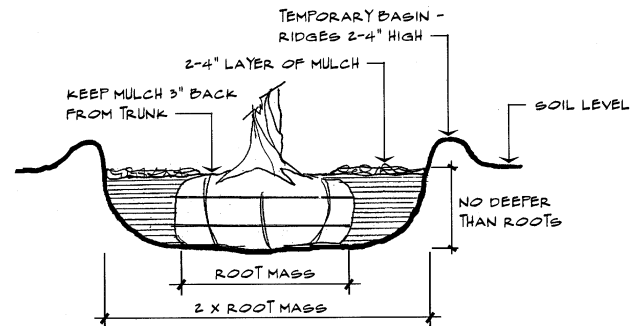
### Time to dig!

#### Prepare the hole

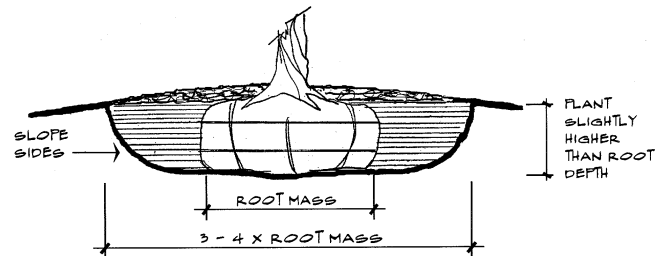
Clear vegetation from the site in a circle at least 6 inches beyond the planned hole size. For normal planting in well-drained soil, the hole should be *at least 2 times* the width of the root ball and only as deep as the root ball or container measured from the root crown (top) to the bottom roots. Discoloration on the bark near ground level of bare-root trees indicates the soil level at which they originally grew. Do not dig the hole deeper than the roots of the plant. If the top of the root ball is below the surface of surrounding soil, water can collect around the trunk, possibly resulting in crown rot of the tree. Roots also may not have enough air to grow and function properly if planted too deeply. If a deeper hole is dug and then filled with loose soil, the tree can eventually settle below the soil surface level. Make certain that the bottom of the hole is solid, not loose, soil.

In poorly drained or compacted soil, make the hole *3 to 4 times* the width of the root ball and not quite as deep as the root ball. The wider the hole, the better. The hole should be wider at the top than at the bottom. Another method is to leave a raised area at the center of the bottom of the hole. The root ball is set on this raised mound, leaving the surrounding (lower) area for collecting excess water that may sit in the bottom of the hole before draining away.

Do not add soft fill, soil, amendments, or gravel to the bottom of the hole before planting. Rough up the sides and bottom of the hole with a pick or shovel to avoid creating a root-constricting "clay pot" instead of a roomy, aerated planting hole. Cultivate the soil around the hole, as well, to encourage healthy root growth.



PLANTING IN GOOD DRAINAGE



PLANTING IN POOR DRAINAGE

#### Prepare the tree

A tree may come from the nursery bare-rooted, growing in a container, (container-grown), or with its roots and some soil wrapped in burlap or another material (balled-and-burlapped). Remove all tags, labels, and twine from the trunk, branches, and root ball to avoid girdling the tree while it grows. If the tree is in a plastic container, remove the container by tapping the bottom and sides and gently pulling the tree from the pot. Another method is to gently roll the container on the ground and then, while supporting the top of the ball with fingers straddling the stem, turn the container upside down and let the roots and soil slide out of the container into your hand.

Always remove containers completely. Large plastic containers can be cut into sections to remove the tree. Be sure to remove the bottom. Metal containers can be slit from top to bottom with a metal cutter. Remove the tree carefully to avoid personal or root damage from sharp edges.

Natural burlap may be left on the root ball of balled-and-burlapped trees, because it will degrade. Any type of plastic wrapping *must* be entirely removed before planting.

Check the root ball for circling roots, particularly on container-grown trees. These roots should be separated and spread outward or cut when planting. Use a very sharp knife for cutting, to make clean cuts in the ball. Remove “girdling” roots, which grow across or around the stem or other roots at the root crown. Cut each girdling root cleanly at its attachment to the trunk, and again beyond the girdled area. Remove the cut portion.

Shorten exceptionally long roots. Crushed or torn roots of bare-root plants should be cut cleanly above the damage. Densely matted roots of container-grown plants should be loosened by slicing vertically with a sharp knife in three to four evenly-spaced cuts around the ball (see drawing at right).

After preparing the roots, work quickly to plant the tree, because small root tips can soon die when exposed to air and light.

Pruning the top of the tree should be done only sparingly. Remove dead, damaged, or diseased branches. Also, remove crossing and rubbing branches. Do not prune for shaping until the tree is established.

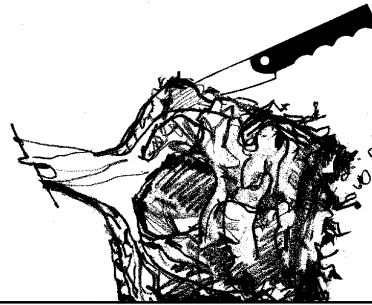
### Planting the tree

Always handle the tree by the root ball, not the trunk, to avoid injury to the tree. Insert the tree in the hole. If the tree is bare-rooted, gently spread out the roots. Make certain that the top of the root system is positioned no lower than level with the soil surface. If planting in poorly-drained or compacted soil, the tree should be planted “high” with the topmost roots slightly above the soil surface. This improves aeration. Check the level of the root ball by placing a straight piece of wood across the hole over the root ball. If the hole is too deep, add soil to bottom and firm it to form a solid base before planting.

Orient the tree in the desired position. If there is a preferred side, face it in a direction that is pleasing to

the eye. If the tree is lopsided, face heavier foliage toward prevailing wind. In very sunny, dry climates, face the best-shaded side toward the southwest, so that strong sun will not damage the trunk. Before filling in the hole, step back and be sure that tree is placed exactly right, straight, and facing correctly.

Fill around the roots with the backfill soil that was dug from the hole, breaking up soil clods with your hands. Gently firm the earth around the tree, and eliminate air pockets by settling the soil with water. Add soil until the tree is fully supported. Do not pack the soil heavily around the base of the tree. If planting with the root crown above soil level in a poorly-drained site, mound additional soil to cover the root ball. Build a temporary basin around the tree base by constructing a ridge of soil 2–4 inches high and 3 ft wide around the tree.



### Staking and guying

Do not stake a tree unless it is absolutely necessary. Stake only for risky situations, such as high-wind areas, very sandy soils, large trees, or for protection from vandalism, heavy foot traffic, or equipment damage. Otherwise, allow the tree to develop naturally, strengthening as it grows. When staking for protection only, surround the tree with three or four stakes, but do not attach the stakes to the tree. If staking is necessary for support, use two stakes on either side of the tree, with flexible tie material from each stake to the trunk. Ties for staked trees should be loose, allowing tree to sway gently. If you do stake, *be sure to remove wraps and wires* as soon as the tree is firmly rooted in the ground, and never later than 12 months after planting.

**Fertilizing**

In most situations, trees will not require any fertilizer at planting. If you are going to fertilize the tree, apply it sparingly. Overfertilizing newly planted trees can be harmful or even fatal. Use only a small amount ( $\frac{1}{4}$ – $\frac{1}{2}$  cup) of a low-nitrogen, complete fertilizer (16-16-16, 10-30-10, or other) at planting. Slow-release fertilizers are best, and “planting tablets” containing slow-release nutrients are convenient and easy to use. Fertilizer can be mixed into the backfill or applied on top of mulch after planting.

**Mulching**

Surround the base of tree with a 2–4-inch layer of mulch over the entire planting area. Mulch conserves water, controls weeds, and protects the trunk. Leave a 3-inch circle around the trunk free of mulch. Do not place plastic under the mulch, as it restricts air and water movement to the roots.

**Continuing care**

Water is the single most important factor for establishing a tree. Water the tree thoroughly after planting, and

on a *regular* basis thereafter. Water weekly, or more frequently in dry, windy, or coarse-soil locations during the first three months after planting. Apply water over as much of the tree’s root zone as possible. Wet the entire root-ball area, and then wet the soil several feet out from the root ball to encourage root growth into the surrounding soil.

Keep the soil moist, but do not overwater. Too much water can be as fatal to trees as too little. Be aware of climate and weather changes. If it is particularly hot or windy, apply more water. Reduce or delay irrigation during rainy periods. The best way to irrigate is in a slow, deep application of water to the root zone, rather than shallow, frequent watering. Drip irrigation or soaker hose with irrigation timers can be useful.

During the first year after planting, only minor pruning should be required to remove branches damaged during planting or afterward.

Observe your tree carefully while it is getting established. Check for moisture and nutritional needs, and be aware of symptoms requiring disease or insect control. Keep the tree in optimum health during establishment to ensure a long-lived and healthy tree.

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