



# Landscaping Committee

## Doverbrook Association

### **Planting**

Technical Guide, Maintenance of Established Trees

#### **Handling Before Planting**

Trees should be carefully inspected upon delivery to be sure they meet specifications for species, root quality, top conformation, and health. They may need to be acclimatized to their new site, a process known as hardening off. Both roots and tops must be kept moist and protected from temperature extremes.

It is best to plant bare-root deciduous trees and shrubs soon after being received. However, they can be held for a few weeks, if kept cool so neither roots nor buds become active. Balled-and-burlapped (B&B) and container grown trees can be planted almost any time, although it is wise to plant B&B plants soon after they are dug. Root balls and containers should be protected from the sun so that periphery roots are not injured.

#### **Preparing the Planting Hole**

In most soils, dig the planting hole one to two inches shallower than the depth of the root ball. In sandy soils, the hole can be as deep, or almost as deep, as the root ball. To prevent settling, make sure that the bottom of the hole is firm. The base of the trunk should be high enough to set slightly above the soil and to prevent water from collecting around it after rain or irrigation.

The hole should be about twice the diameter of the root ball, so backfill soil can be placed easily. For bare-root trees, the hole only needs to be large enough to take the roots without crowding. Roughen the sides and bottom of the hole with a shovel to enhance root penetration into the surrounding soil.

#### **Preparing and Setting the Tree**

Prune back the dead, diseased, broken, and twisted roots of bare-root plants to healthy tissue. For container grown plants, remove most of the roots that are matted at the bottom or are circling around the root ball.

Straighten the remaining ones. Roughen the outside of the root ball to improve contact with the fill soil. A number of factors affect how a tree should rest in the hole. Since some of these may conflict with one another, priorities will be needed. Set the plant so that it will be viewed to best advantage. Place the crook of the scion of budded (grafted) trees toward the afternoon sun to minimize bark injury. If this is not possible, shade the area or paint it with white exterior latex paint. Orient the side with low branches away from the areas of high activity. Point the side with the most branches into the direction of prevailing winds.

If none of the above are problems, orient the plant with the largest branch or most branches away from the afternoon sun. The less developed side will benefit from more sunlight. For greatest stability of bare-root trees, place the largest root in the direction away from prevailing winds. If the top of the tree is not vertical when the root ball or trunk base is straight, tip the root ball to bring the trunk more upright.

### **Backfilling**

Backfill the hole with the original soil, unless it is in extremely poor physical condition. Amending backfill soil with organic or inorganic materials has seldom proven to be of physical benefit even during the first years. Backfill amendments may contain nutrients or organisms that are beneficial to a newly planted tree, but amending the backfill is not the easiest or cheapest way to obtain such benefits.

If backfill is amended, the final mix should be at least 40 to 50 percent amendment by volume and mixed thoroughly with the soil. Sand should not be used as an amendment, and fertilizer should not be added to the backfill or placed in the planting hole.

Set the roots or root ball on a firm base. Before putting the root ball of a B&B plant in the soil, cut the fabric covering in several places to make it easier for roots to penetrate. Work the soil in among the roots of bareroot and container plants so their roots are not compressed into a tight mass, but are spreading and supported by the soil. After adding each three to four inches of soil, firm it gently with one foot. Before adding the last layer of fill soil to a B&B plant, cut off any loose fabric that would remain exposed above the ball. Gently fold it down and cover it with the last layer of fill soil. Exposed fabric can act as a wick and dry the root ball. Do not cover the rootball with backfill soil, it could keep water from wetting the root ball.

Form a low berm around the edge of the planting hole and a higher one a foot farther out (Fig. 7). Water the inner basin to be sure the soil is moist and to help it settle. Double check the planting depth. If the original soil is at or below the fill soil, raise the tree. Gently lift bareroot trees by the trunk. Support B&B and container plants from below the root ball with a shovel while lifting gently on the trunk. Raise the tree two to three inches higher than finally wanted to allow for settling. Water the outer basin if the soil appears to be dry.

### **Staking and Guying**

Trees that cannot stand upright on their own need to be braced with tall stakes or guy wires. Many nursery trees-particularly those in containers-are grown close together, tied to a single stake, and have their lower branches removed. As a result, they are unable to stand without support. The trunks of some trees are so spindly that they would bend below guys; these must be supported by stakes. If staking or guying is necessary, install the stakes or guys after planting but before watering the outer basin.

Two support stakes with one flexible tie near the top of each will hold a tree upright, provide flexibility, and minimize trunk injury and deformation. Support stakes should be a little higher than needed to hold a tree upright in calm weather and allow the trunk to return to vertical after being deflected by hand or wind. Tie material should contact the trunk with a broad, smooth surface and have enough elasticity to minimize trunk abrasion and prevent girdling. Although widely used, wire inserted through hose can cause injury in windy areas. Support staking is temporary and should be removed soon after a tree can stand alone.

Most young trees that are exposed to moderate wind and weather concentrate their energy on growing strong enough to remain upright. They develop sturdy trunks that are tapered to bend without breaking, and strong root systems to hold trunks upright. It is wise to select such trees and to provide them with as much flexibility as possible when planted. Inspect stakes, ties, and the general condition of newly planted trees several times during the growing season to ensure tree health and well being. If wind is not a problem, place the stakes in a way that provides maximum protection from traffic and equipment. In situations with moderate to strong winds, an imaginary line drawn between the support stakes should form a right angle to the most critical wind direction. The ability of stakes to withstand wind, particularly when the soil is wet, can be increased by connecting the two stakes with a wood cross tie partially or entirely below the soil surface. Place the cross tie to the lee (downwind) of the stakes, being careful not to injure roots near the surface. If a single stake is used, it should be placed on the windward side of the tree to minimize trunk injury.

Avoid placing a tie on the trunk closer than 30 inches from the tip, especially on trees not previously staked. This arrangement will subject the trunk to maximum stress at the tie and increase the chances of it being deformed or broken by the wind. A flexible auxiliary stake of light spring steel or bamboo may be needed to support the trunk terminal. In a densely-headed tree, thinning out some of the branches will lighten the top and reduce its resistance to the wind.

Young trees are particularly subject to vandalism, and few staking devices have successfully prevented damage. Many agencies plant larger trees to reduce tree damage. Planting trees with fairly dense skirts of small twigs along the lower trunk obscures vulnerable trunks. Seattle has been fairly successful in protecting young trees in vandalism-prone areas by using five-eighths-inch thick metal reinforcing bar ("rebar") driven four to five feet into the soil and extending five to six feet above ground. A two and one-half-inch or larger diameter tree is tied at three heights to the stake. The stake is removed after one year.

Even trees that can stand without support need protection from equipment operations and other activities. To protect the trunks, set two or three short stakes just outside the root ball with 18 to 24 inches exposed. Other trees may be poorly anchored by their roots, although the trunks seem sturdy enough to hold their tops upright. Anchor these trees by guying their trunks or tying their trunks to stakes similar in height to protective stakes.

### **Pruning and Training**

In years past, severe pruning after planting was thought to be necessary. However, newly planted trees grow quite well if their tops are pruned lightly or not at all. On the other hand, up to 25 percent of the tops of newly planted trees can be removed without greatly affecting total future growth.

The key to pruning is to encourage the growth of several large permanent branches, called "scaffold branches," that will ultimately form the basic structure of the mature tree. At planting, remove branches growing close to potential scaffold branches, crossing one another, damaged, and those having included bark in their attachments. Also, remove or reduce the size of large branches that are too low.

Central-leader trees, conifers, and some hardwoods, require little pruning to grow strong and well shaped. However, species that become round headed may need considerable pruning the first few years to ensure the desired height of branching and strong branch structure.

During a tree's early years, frequent observation and directional pruning will guide the growth along a desirable course. This will improve the appearance and structural strength of the mature tree, and can greatly reduce the need for severe corrective pruning later. To do this, retard or remove large branches where they will not be wanted when the tree is mature. Temporary branches can protect the trunk from sun and vandals, as well as increase trunk growth and taper. Maintain temporary branches by encouraging twigs or keeping small branches cut back along the trunk below large permanent branches. They should be kept small, and removed as the tree matures. This practice is in line with the observation that a tree is better able to withstand wind, snow, and ice if at least one-half of its foliage originates from branches along the lower two-thirds of the trunk. The less a branch or tree is pruned the more total growth it will make. So, pruning should be used to control growth. For example, large branches that might be too low or that might compete or interfere with more desirable branches need to be pruned back or removed. Branches that will become the main scaffolds, particularly of large-growing trees, should be at least one-third smaller in diameter than the trunk where they arise, and should be vertically spaced at least 18 inches apart along the trunk.

If a branch is in a desirable location but is large compared to the trunk or other branches, it can be pruned to reduce its leaf area and slow its growth. This increases the strength of the branch attachment, because the trunk can grow around the branch and hold it more securely. The relative sizes of a branch and the trunk are more important than the angle of attachment in determining the strength of that attachment,

although a sharp angle of attachment is a good indication that branch size may be a problem. A tree will be more open and retain its natural form, if branches are removed completely (thinned) in contrast to being headed or stubbed. Heading concentrates subsequent growth just below the pruning cut and results in dense foliage with weakly attached branches.

When removing a branch, make the final cut just outside the branch bark ridge in the crotch and the collar below. This type of cut minimizes the size of a wound and the possibility that the trunk will decay. Painting pruning wounds has not been shown to reduce decay, and may even increase it.

### **Fertilization**

In some tests, newly-planted trees have responded to fertilization following planting, and in others response occurred only the year after fertilizing. Unless experience indicates otherwise, fertilization after planting is recommended. The benefits may be well worth the modest cost. In most soils, nitrogen is deficient and the only added nutrient to which trees will respond. Nitrogen fertilizers are or become water soluble, so they can be applied on the surface and be carried into the soil with water.

After the first application, apply fertilizer in the late summer or fall, so it is available for spring growth. Water after fertilization being careful not to wash the material to the bottom of the watering basin. This could create a toxic level of chemicals.

Slow-release forms of nitrogen may be advisable in sandy soils. In alkaline soils the availability of iron and manganese may be so low that certain plants exhibit the typical pale leaves with narrow (iron) or wide (manganese) darker green bands along the veins. Chelated forms of these nutrients can be applied to the soil or foliage according to the manufacturer's directions. If the trees respond to the chelated materials, a longer term and less expensive solution is to acidify the soil with sulfur.

### **Water Management**

Young trees need adequate water to become established. Although rainfall may be adequate in some areas and in some seasons, additional water may be needed, particularly after planting when root systems are limited. After the initial watering at planting, deciduous trees do not need additional water until the first leaves have reached full size, or even later.

Pay attention to container and B&B plants that are in leaf. During the early part of their first growing season, they will need water more frequently than at the nursery. Container root balls hold less water when in the ground than in the container. And, the root system of B&B plants are greatly reduced when they leave the nursery.

At first, water the root ball and the backfill only enough to re-wet the soil. After the first few weeks, lengthen the irrigation interval. The area beyond the backfill needs to be watered only every two to three weeks. By the end of the season, the irrigation interval should be three to four weeks. Of course, rain must be taken into account. Over watering can be as serious as under watering. If winter rainfall has been adequate, trees should not need to be irrigated more than once a month during their second year. After that, most trees can survive with only one or no irrigations, although they would probably do better with monthly applications.

### **Soil Management**

It is essential to maintain an area free of turf and weeds around tree trunks, because turf and weeds compete for water and nutrients, and some produce chemicals toxic to other plants. A small turf-free area around a tree also reduces the need for mowers to come close. This clear area must be at least one-foot in radius. Larger areas add little benefit. After four or five years, tree roots are extensive enough that other plants close to their trunks are not a problem, although mower operators should still exercise caution.

A three to four-inch-thick mulch, material placed on the soil surface, controls most weed seedlings. In addition, mulch protects the soil from compaction and erosion, conserves moisture, moderates soil temperatures, provides an all-weather surface for walking, and allows plants to root in the fertile and well-aerated surface soil. Keep mulches at least two inches away from the trunks of trees to minimize disease and rodent damage. A wide range of organic and

inorganic materials can be used. Unfortunately, most bulky mulches are not satisfactory for trees in turf that is mown, but some plastic planting-basin covers will reduce turf and weed growth. Power string trimmers are great for edging around borders and plants, but many trees have been fatally girdled by them. Trees are particularly vulnerable to girdling during the growing season when the cambium (the growing portion of the trunk just under the bark) is active. The cut weeds or turf return to their original more upright position obscuring the damage until the tree begins to weaken.

### **Pest Management**

Most trees get off to a good start, but serious problems can be avoided or minimized if the trees are periodically inspected. Inspect trees for the beginnings of insect and disease damage. At the same time, take care of any staking problems, do needed directive pruning, check on tree moisture status, and identify any other problems. The inspection should take only a few minutes per tree, but prompt action on any problems encountered would pay big dividends in healthier, stronger trees.