

PROPER PLANTING PROCEDURES FOR TREES AND SHRUBS

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Seven areas pertaining to transplanting must be addressed in order to improve survivability of transplanted trees and shrubs. These are site assessment prior to planting, selection of a species for the specific location, purchasing quality plant material, proper planting procedures, proper staking (for some trees), soil surface management, and after-planting care. This article will concentrate primarily on proper planting methods.

Before planting we will assume that one has assessed the site for below and above ground environmental factors such as soil conditions, potential drainage problems, power lines, etc. and has chosen a species that will thrive under those conditions. In addition, we have purchased quality plant material.

When planting, how wide should a planting hole be dug? How deep? Several practices are applicable to all planting, whether one is planting balled and burlapped, container-grown, or bare root trees or shrubs. Planting holes should be dug no deeper than the root ball. One of the main causes of transplant death is planting too deep in the hole. Plants should be set either even with the surrounding ground level or a bit higher. Often times, a root ball seems to be set correctly when planted, but since the soil in the planting pit was disturbed, the root ball settles and the roots become deprived of oxygen. If the hole is dug too deep, then soil should be added back and the bottom of the hole firmed to reduce settling. As a general rule, it is better to error on the high side than to plant too deep, especially in clay soils. On the other hand, the width of the planting hole should be at least three times the diameter of the root ball. Contrary to what many of us have been taught, roots do not grow straight down. Roots grow laterally and the majority of tree and shrub roots are within the top six to twelve inches of the soil. By digging a wide planting hole, roots will face less resistance in growing out of the original root ball as the disturbed soil will be more aerated, less compacted, and provide a more favorable growing environment. After all, the most important key to a successful planting is regenerating roots.

What about soil amendments? It seems logical to assume that adding amendments to a planting hole to improve aeration and drainage would be advantageous. However, one must be careful. In an ideal world, the entire planting area or bed would be prepared rather than individual planting holes. For example, in a 250 sq ft bed consisting of a clay soil, amendments such as peat moss and compost can be incorporated into the soil to provide aeration and a favorable environment for root growth. The key here is amending the entire bed or planting area. Amending individual planting pits may produce a texturally different soil when compared to the surrounding soil. Larger pore spaces are present inside the planting pit so water will not move readily between the different textured soils. Therefore, one has created a 'bathtub' that will fill up with water. Plants that thrive with wet feet are found in swamps and marshes, not your typical landscape. Some may say that it is not economical to prepare an entire planting area or even to dig every hole three times the width of the root ball. This may be true in many situations, but replacing plants that die is not economical either.

When considering balled and burlapped plants, the question is often asked, should burlap be removed prior to planting. The answer depends on the type of material. Often times, when one tries to remove burlap the root ball has a tendency to fall apart which results in additional root loss. Because new roots emerging from the root ball can grow through the weave of the burlap and the fact that most burlap will eventually break down, there is no reason to remove normal burlap. However, all ropes must be removed to prevent girdling. Furthermore, the burlap around the top should be folded down below the soil surface. If it is left exposed to the air it will act as a wick pulling moisture from the soil. On the other hand, it is very important that synthetic material or treated burlap is removed. This material will not decompose and roots will have difficulty penetrating the fabric in order to grow into the surrounding soil.

When planting container grown material all circling roots should be cut. Otherwise they will continue to grow in diameter and will eventually girdle the plant. Many nursery growers use specially designed pots or containers treated with copper substances to help control circling roots. Regardless, a key to successful planting of container grown plants is root to soil contact. Container media is generally a light mix containing much poor space. As mentioned above, because of the soil texture contrast between the

container media and the surrounding soil, a water drainage problem exists in heavier soils. In addition, roots will have a tendency to stay in the lighter media and will not grow into the surrounding soil. A basic principle root growth is that roots grow where the environment is favorable for growth. In this case the lighter media is more aerated. To help alleviate this problem the root ball should be broken up to expose some of the roots to the surrounding soil.

Many of the above problems with balled and burlapped or container-grown plant material can be avoided by planting bare root material. One advantage is a larger percentage of the total root system is recovered when compared to B & B material. An advantage bare root over container material is that one doesn't have to consider textural differences in the soil. The big disadvantage is keeping the roots from desiccating until one is ready to plant. When planting, do not just stick the wad of roots into the hole and cover them with soil. Roots should be spread laterally in all directions near the soil surface, as they naturally would have grown.

A point should also be made regarding mechanically dug planting holes. Whether one is digging with a tree spade, auger, or just a shovel, the surrounding surface of the hole should be roughened. Mechanical diggers have a tendency to glaze the walls of the planting hole, especially in clay soils. This glazed surface should be broken up or roots may tend to circle around the edge as if they were growing in a container.

Should trees and shrubs be pruned at the time of transplanting? Many people reason that since roots were lost during digging that one should prune back the tops to maintain a balance between roots and shoots. However, this is not always true. Granted, all broken or damaged branches that occurred during shipping should be removed. Likewise, all dead and diseased branches should be removed but this shouldn't be necessary if one purchased quality plant material. The only reason to remove foliage is to reduce transpiration. This makes sense if one considers that the plant likely has fewer roots to collect water and may lose water faster than it can take it up from the soil. But, if the plant is properly watered during the reestablishment period then pruning is not necessary. Furthermore, auxin, a natural plant hormone that promotes root growth is produced in the growing tips, the same growing tips that one may prune off. Leaves also photosynthesize producing carbohydrates that the plant uses for energy and structural elements necessary for root growth. So why prune?

Should fertilizer be added at the time of planting? Again, it depends on what fertilizer we are talking about. Plants naturally will maintain a functional equilibrium (root to shoot ratio) depending on the environmental growing conditions. A cactus growing in the arid desert puts most of its energy into producing roots to find water, while a tree growing in a tropical rainforest will favor shoot growth since water is plentiful. Likewise, a plant will not expend most of its energy to grow roots if there is plentiful nitrogen in the soil. Nitrogen promotes top growth. We don't want top growth right now. We want root growth to bring the plant back into functional equilibrium. In my opinion, quick release nitrogen should not be added at planting. However, a slow release fertilizer and other elements such as phosphorus and potassium can be beneficial.

Other points to consider following the actual planting process are proper staking of trees, tree wraps, soil surface management such as mulching, and after-planting care. Regardless of whether one is planting balled and burlapped, container-grown, or bare root trees or shrubs, the key to successful transplanting is regenerating roots. The resumption of root growth is essential. A properly planted tree or shrub will not only be less likely to need a replacement, it will be healthier, more attractive, and should provide enjoyment for years to come.