

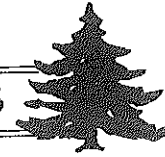
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Planting and Maintaining Trees and Shrubs

When considering the planting and maintenance of woody plants, many of the established cultural guidelines practiced by landscape professionals have undergone closer scrutiny in recent years. Based on research findings and field observations, many of these practices have been modified or changed in order to improve overall plant health in a landscape setting.

Research has shown that improper planting techniques, particularly planting "too deep", is a major cause of tree mortality in managed landscapes. In addition, research has shown the accepted practices governing the size and shape of the planting hole and the nature of the "backfill" mixture require some modification.

Site Evaluation

Before choosing and planting trees and shrubs, consideration and careful attention should be given to the site itself. Each site should be evaluated for the following:

- * Slope * Hardiness Zone * Soil Type * Exposure * Amount of light * Drainage
- * Space or size * Soil pH/Nutrient availability

Plant Selection

After site evaluation, select plant material that will adapt well to that location. Match the needs of the plant to the site. When choosing plant material it is also important to know growth habit and ultimate size, maintenance needs, pest resistance, function and potential invasiveness.

Currently there is a great debate on the use of "native" plants over "introduced" or "exotic" species. Where appropriate, choose the best plant for a given location. This choice may or may not be a "native". Most urban landscape sites have been so modified and the microclimate so changed through buildings, underground wires, pavement, traffic, soil compaction, and so on, that native plants may not perform as well as non-native plants. Do not choose plant material based solely on the merit of its being a native.

Choose the "right plant for the right location" but also consider existing plant communities and avoid planting monocultures.

Site Preparation

Because the fibrous or absorbing roots of most woody ornamentals are within the top 10" to 12" of the soil, it is recommended that the planting hole be dug no deeper than the rootball as measured from the trunk flare to the bottom of the ball. Holes dug deeper than the rootball often result in settling of the plant to a point above the trunk flare. As root development often extends beyond the canopy or dripline, it is now recommended that the planting area be loosened and aerated at least three to five times the diameter of the rootball.

Planting Hole Preparation

One of the most common errors in tree planting is that the rootballs are either planted too deep or too high, both of which can cause serious problems.

To properly plant balled and burlapped (B&B) plant material, begin by locating the point at which the trunk flare begins. In some cases, the trunk flare junction may be buried in the top of the rootball and it may be necessary to loosen the burlap at the top of the ball to properly locate the junction. Measuring from the trunk flare to the bottom of the ball will give the correct planting hole depth.

Try to maintain the integrity of the rootball until it is secure in the hole. In the event that some of the soil should fall away from the roots, simply proceed with the planting, taking care to ensure that the roots do not dry out from sun or wind. The hole size should be approximately three times the width of the ball and have sloped sides.

Setting the Plant

Carefully set the plant in the hole so that the trunk flare is at, or 1 to 2" above, the existing grade. Once the plant is properly placed, cut away and remove all visible rope and burlap. If the rootball appears in danger of completely collapsing, remove the rope and burlap from only the top one-third of the ball. Although still subject to debate, it is recommended that at least the top 8-16" of the wire basket be removed once the rootball is stable in the planting hole. Do not leave any protruding points of wire which could cause injury.

Backfilling the Planting Hole

According to research, backfilling with soil dug from the planting hole is preferable to mixing the soil with large amounts of organic soil amendments such as peat moss, compost, etc. The addition of an organic soil amendment may be called for if the existing soil is of poor quality, i.e. excessively sandy, heavy clay or undesirable fill material. Alternatively, quality topsoil, similar in texture to the existing soil, may be brought in and used for backfill.

While backfilling the hole, tamp the soil lightly to avoid leaving air pockets. However, do not pack the soil so firmly as to drive out all the fine air spaces needed for a well-aerated soil. As an alternative to tamping the soil, water the soil halfway through the backfill process and allow it to drain. When the water has drained away, resume backfilling and water again thoroughly.

To complete the backfilling, smooth the surface soil and check to ensure that the trunk flare is completely exposed.

Fertilizing

Incorporate phosphorus, potassium and limestone according to a soil test report. Avoid placing water-soluble nitrogen fertilizer directly in the planting hole to avoid injury to roots. If needed, a slow release or organic fertilizer could be mixed into the planting area or be applied on the soil surface around the tree basin.

Staking

While there are many options on the method and value of staking trees at planting time, most experts agree that staking is not necessary for all trees. Trunk strength, size of the canopy, wind direction and site traffic problems should all be considered before staking a tree. Research has shown that staked trees may develop a smaller root system and decreased trunk taper. If the rootball is stable in the soil, then it may not need to be staked. However, if the rootball is unstable and staking is required, try to attach stakes low on the trunk and allow some sway. In most instances, stakes should be removed after one growing season.

Mulching

Mulching is a cultural practice that can be of benefit in the landscape when done correctly. Mulching will reduce weeds, moderate soil temperatures, conserve soil moisture in the root zone and add an aesthetic quality to the landscape. Improper mulching can impair plant health and lead to the decline of the plant material.

Organic mulch should be placed in a wide band, approximately 3 times the diameter of the rootball, over the root zone and no more than 2 to 4" deep tapering to, but not touching, the trunk. Mulch piled up against the trunk may cause rotting of the bark and can create entry points for insects or disease organisms. Field mice may also inhabit deep mulch and feed on the bark.

Pruning

After transplanting, prune only broken or damaged branches. Top pruning to compensate for root loss is no longer recommended. It is important to leave as much foliage on the tree as possible because carbohydrates and other products produced by photosynthesis in the leaves are necessary for root system regeneration and development.

Guidelines for watering newly planted Trees and Shrubs

Watering is the most important aspect to the successful establishment of newly planted trees and shrubs. Depending on the size of the tree, regular watering may be required for several years. Newly planted trees of any variety are very susceptible to drying out while their roots are getting established.

The amount and frequency of watering depends on several factors:

- Rainfall - Generally one inch a week will meet most needs
- Soil type and drainage - Sandy soils leach water faster than clay
- Temperature - Cooler weather reduces water requirements
- Wind - Warm windy days increases transpiration (water loss thru leaves).

A typical watering schedule for Spring and Fall plantings might be:

Week 1 - Every other day around the root ball

Weeks 2-4 - 3 times per week around the root ball

Weeks 5-12 - 2 times per week

Then water once per week (or until ground freezes) for a year, out to the tree canopy. For fall plantings continue the watering thru the next growing season. Larger trees require watering for more years, before letting nature take over. It takes about 1 year per inch of tree caliper for a tree to re-gain its root system.

For summer plantings in hot weather, water daily for the first week, and every other day for the next two weeks.

As a general rule, a newly planted tree needs 5 Gallons per week, plus 5-7 gallons per inch of caliper. So a 2" caliper tree needs 15-20 gallons per week.

Small shrubs need 3 or so gallons per week, while larger ones need 5-6 gallons.

Water delivery

Lawn sprinkler systems are not apt to provide a deep enough watering for trees and shrubs. If you cannot hand water, Use soaker hoses or a slow trickle from a hose. Measure the time it takes to fill a gallon bucket. Alternatively, drill 2-3 1/8 inch holes in the bottom of a 5 gallon bucket, fill and place over the root ball. Water at a slow rate. Use a wood dowel or dig down a few inches at the root ball to determine if it is dry. Don't water if the soil is still moist. Overwatering can harm plants by depriving them of oxygen.

Final note:

For evergreens and broadleaf evergreens in exposed areas, we recommend using an anti-transpirant spray (such as Wilt-Pruf) in late fall, for at least the first year.

Tree Wrapping

The bark on a tree or shrub is as important as skin to an animal. It acts as a barrier to exclude insects and disease organisms from the vascular system which lies directly under the bark. Some bark injuries may occur as a result of damage from the sun (sunscald) or temperature extremes (frost cracks). For many years it has been a common practice to use tree wrap on newly planted or thin-barked trees in an effort to reduce sun or temperature damage to the bark.

Research has found that some tree wraps may not provide the protection that was originally intended. In experiments using plastic tree guards on dogwoods, large number of dogwood borers were found under the guards while few were found in trees without guards. In addition, some tree wraps were found to retain excess moisture beneath the wrap; this may encourage fungal or bacterial growth, especially if there were pre-existing wounds in the trunk.

If tree wrap is to be used, it is recommended that appropriate material be selected, checked frequently, and the wrap be removed during periods of active growth.

It is hoped that these guidelines, together with the selection of appropriate and healthy plant material, will be of help in promoting improved plant health in the landscape.

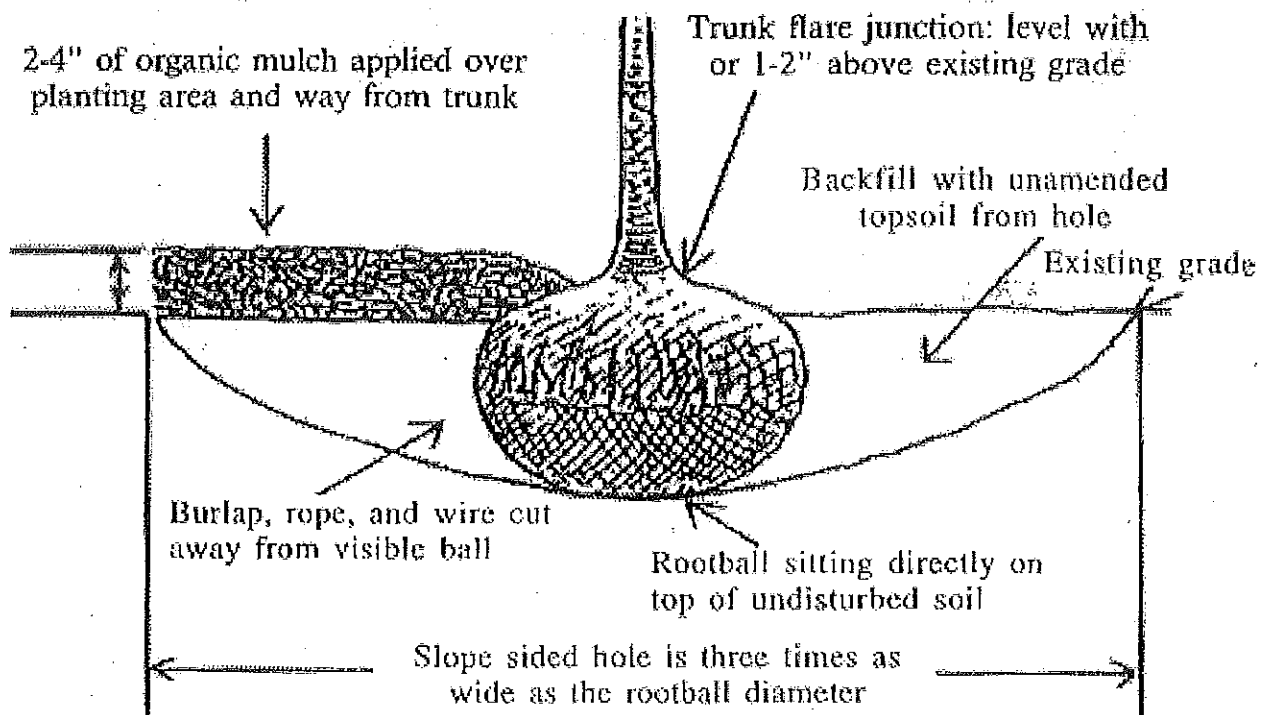


Diagram illustrating proper planting procedure for a tree or shrub.