UNIVERSITY OF FLORIDA
EXTENSION
Institute of Food and Agricultural Sciences

ENH856

Specifications for Planting Trees and Shrubs in the Southeastern U.S.[1]

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Digging the Hole

Before digging the hole:

1) Remove all soil from above the root flare to expose the topmost root where it emerges from the trunk, and

2) Measure the distance between the topmost root and the bottom of the root ball. Dig the hole about 10% shallower than this depth and as wide as possible (at least 1.5 to 3 times the width of the ball). The root ball should be positioned shallowly in the hole so that the finished grade of the backfill soil and landscape soil is lower than the top of the root ball (Figure 1).

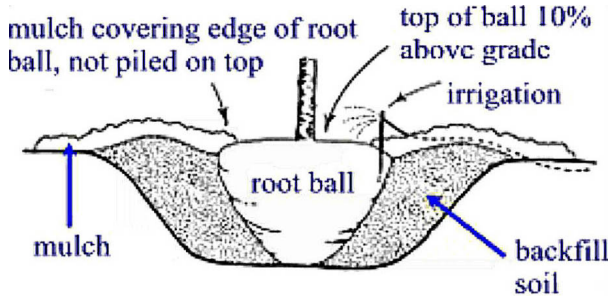

Figure 1. The root ball should be positioned in the hole so that the finished grade of the backfill soil and landscape soil is lower than the top of the root ball

In other words, leave the top few inches of the sides of the root ball exposed to the air. Then apply mulch so it covers the sides of the root ball. Be sure that when you are finished planting, there is no soil, and little or no mulch, over the top of the root ball. Soil (and thick mulch layers more than 1 or 2 inches deep) over the root ball can prevent water and air from entering the root ball. No amendments of any kind are necessary in the backfill soil because extensive research clearly shows ammendments they typically do not increase survival nor improve growth after planting. When finished planting, you should be able to see the topmost root in the root ball originating from the trunk at the soil surface, or it should be within the top inch of soil in the root ball. The trunk flare should be visible.

Tip: Never place any soil over the root ball.

Fertilization

Slow-release (or controlled-release) fertilizer can be applied on top of the root ball and backfill soil or on top of the mulch at planting. There is no need to mix it with the backfill soil or place it at the bottom of the planting hole since most roots end up close to the soil surface in urban and suburban landscapes. Under most circumstances, mulch will not steal the

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fertilizer from the tree. Adding slow-release fertilizer at planting has not been associated with either improved survival or increased growth after planting. It will not hurt the plant provided it is applied according to the directions on the product. On the other hand, adding soluble fertilizer to a newly installed plant could burn roots if too much is applied. This will injure the plant and could kill it. Any nitrogen source can be applied to established trees with about the same effect.

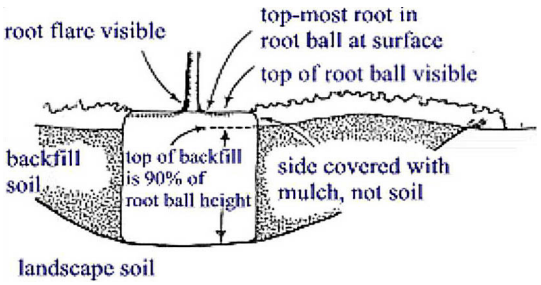

Figure 2. Apply a 3-inch-thick layer of mulch around the plant to help discourage weeds

Mulching

Weed and turf suppression during establishment is essential. Apply a 3-inch-thick layer of mulch around the plant to help discourage weeds (Figure 2). An area two feet in diameter for each inch of tree trunk diameter (minimum diameter should be eight feet for trees with a trunk diameter less than 3 inches)should be maintained during the establishment period. If you wish to place mulch over the rootball, apply only a thin layer over the outer half of the root ball. This keeps the trunk dry and allows rainwater, irrigation, and air to easily enter the root ball. Mulch resting on the trunk or layered too thick can kill the plant by starving it of oxygen, killing the bark, causing stem and root, preventing hardening off causing for winter, encouraging rodent damage to the trunk, keeping soil too wet, and repelling water. Mulch on the root ball has little impact on water lost from the tree since most of the moisture that leaves the root ball does so by transpiration, not evaporation. Only a small amount (< 10%) leaves the root ball by evaporation from the surface of the root ball.

Staking

In many instances, if root balls are heavy enough, stakes are not necessary. Stake to stabilize the root ball (Figures 3, 4 and 5). Most field grown trees do not need staking because their root balls are heavy enough to stabilize the tree in the ground. Some container grown trees will require staking in open areas since root balls are much lighter in weight.

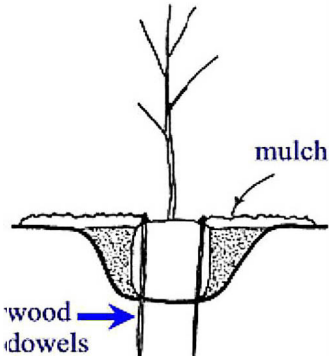

Figure 3. Two or three (2 shown) wood dowels driven through edge of root ball. These do not have to be removed because they simply rot in place. There is no danger of this system girdling the trunk since nothing is attached to the trunk.

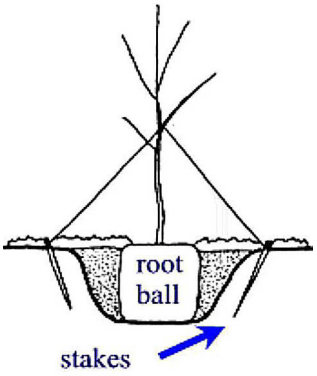

Figure 4. Traditional staking could girdle the trunk.

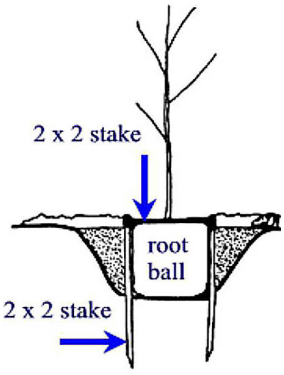

Figure 5. One horizontal 2-inch x 2-inch stake screwed to two vertical 2 x 2s against the side of the root ball. A second set is used on the other side for larger trees if needed.

Establishment

Trees and shrubs provided with regular irrigation through the first growing season after transplanting require about 3 months (hardiness zones 9-11) to 6 months (zones 7-8), per inch of trunk diameter to fully establish roots in the landscape soil. Plants that are under-irrigated during this establishment period often require additional time to establish because roots grow more slowly. Most trees are under-irrigated during the establishment period. Because roots are not fully established, be prepared to irrigate through the entire establishment period, especially in drought.

Irrigation

Unlike established plants, research clearly shows that recently transplanted trees and shrubs establish quickest with light, frequent irrigation. For trees planted in spring or summer, provide two (cooler hardiness zones) to three irrigations (warmer hardiness zones) each week during the first few months after planting (Table 1). Daily irrigation in the warmest hardiness zones provides the quickest establishment. Following the initial few months of frequent irrigation, provide weekly irrigation until plants are fully established. At each irrigation, apply about 2 to 3 gallons of water per inch of trunk diameter (e.g. 4-6 gallons for a 2-inch tree) over the root ball. Never add irrigation if the root ball is saturated.

Table 1. Irrigation Scheduling for Recently Planted Trees

Size of nursery stock	Irrigation Schedule for Vigor [1,3]	Irrigation Schedule for Survival [2,3,4]
< 2 inch caliper	Daily for 2 weeks; every other day for 2 months; weekly until established.	Twice weekly for 2-3 months
2-4 inch caliper	Daily for 1 month; every other day for 3 months; weekly until established.	Twice weekly for 3-4 months
> 4 inch caliper	Daily for 6 weeks; every other day for 5 months; weekly until established.	Twice weekly for 4-5 months

[1] Delete daily irrigation when planting in winter. Irrigation frequency can be reduced slightly (e.g. two to three times each week instead of every other day) when planting hardened-off, field-grown trees that were root-pruned during production. Establishment takes three (hardiness zones 10-11) to four (hardiness zones 8-9) months per inch trunk caliper.

[2] Irrigation frequency can be reduced slightly (e.g. to once or twice each week) when planting hardened-off, field-grown trees that were root-pruned during production.

[3] At each irrigation, apply two to three gallons per inch trunk caliper to the root ball. Ensure that all water soaks into the root ball. Do not water if root ball is wet/saturated on the irrigation day.

[4] Trees take much longer to establish than three to four months per inch trunk caliper when under-irrigated. Be prepared to irrigate the following summer.