



GardenNotes #635

Care of Recently Planted Trees

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Root Establishment Phase

During the establishment phase in a tree's life cycle, primary growth occurs in the root system, with minimal growth in the canopy. The science of planting trees is aimed at encouraging this root growth, reducing *post-planting stress*. For additional information, refer to *CMG GardenNotes* #101, Plant Health Care, and #633, The Science of Planting Trees.

With good planting techniques and soil conditions, the establishment phase takes one growing season per inch of trunk diameter (in Hardiness Zones 4 and 5). On small trees (up to four inches in diameter), trunk diameter is measured at six inches above the soil line. That is, a one-inch caliper tree typically takes one year for roots to establish. A two-inch diameter tree typically takes two years. In cooler regions with shorter growing seasons, it will take longer. In warmer regions, like the southern United States, the establishment phase is measured in months.

With poor planting techniques and/or poor soil conditions, the establishment phase may take many years. It is common to observe trees that never establish, but rather simply hang on for a few years and gradually decline.

A significant increase in annual twig growth indicates that roots have become established and that the tree is shifting into the growth phase.

The purpose of this *CMG GardenNotes* is to summarize tree care during the establishment phase.

Watering

Regular irrigation after planting encourages rapid root development, for tree establishment. Under-irrigation often leads to slow establishment, canopy dieback, and bark splits (frost crack and sunscald) on the trunk. After the first couple of years, it is common to find under-irrigated trees that have minimal root growth. Recently planted trees and shrubs establish most quickly with light, frequent irrigation. For recently planted trees, primary water extraction is from the root ball and the root ball can become dry in just a day.

Larger volumes of water applied infrequently will not compensate for the need for frequent, light irrigation. On newly planted trees, soil amendments do not significantly reduce the need for frequent irrigation. Drought-tolerant species are not drought-tolerant until the root system becomes established. In sites without ideal irrigation management, smaller-sized nursery stock would be preferred because they establish faster.

When watering non-established trees, check the soil frequently, and water according to need. The soil could be dry in the root ball and wet in the backfill, or wet in the root ball and dry in the backfill. If the tree is planted in a newly sodded/seeded irrigated lawn, it is typically over-watered. [Figure 1]

Compacted, undisturbed soil can create a basin that collects and holds water.

Depending on the texture interface between the root ball and backfill soil, one may be dry while the other is overly wet.

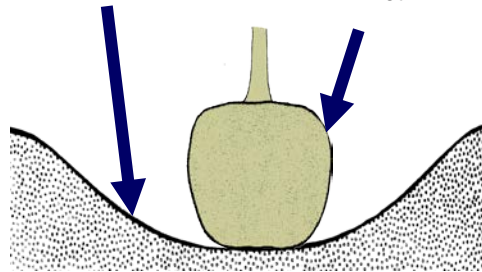
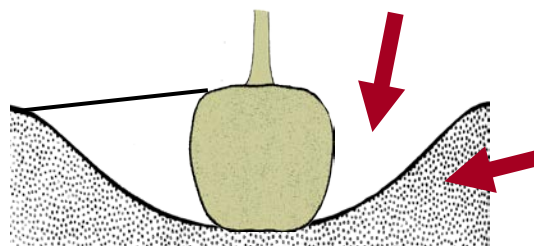


Figure 1. On non-established trees, check the water needs in the root ball and back fill soil frequently. Water according to observed needs.

The only way to know the watering needs of non-established trees is to check soil moisture levels. A useful tool for the home gardener is a houseplant water meter. While somewhat inaccurate, it can indicate wet or dry. (Note: If the fertility is high, it will read on the wet side. If fertility is low, it will read on the dry side.)

Check both the root-ball soil and the backfill soil. For a two-inch caliper tree in Hardiness Zone 5, it takes one growing season for the roots to extract significant amounts of water from the backfill soil, and two or more years for significant water extraction from the soil beyond the planting hole. [Figure 2]

With good planting techniques, it takes a growing season for significant water uptake from the backfill soils.



It takes two or more years for significant water uptake from the site soil beyond the planting hole.

Figure 2. Check water needs in the root-ball soil and the backfill soil.

Learn by carefully monitoring the amount and frequency of irrigation needed for each tree. Estimated irrigation needs are given in Table 1.

Table 1.
Estimated Irrigation of Newly Planted Trees and Shrubs (during the growing season) – **Check soil moisture and water as needed.**

<u>Size of Nursery Stock</u>	<u>Irrigation Need for Vigor</u>
<2-inch caliper	<ul style="list-style-type: none"> ○ Daily for 2 weeks – Depending on temperature and wind, apply 1-2 gallons per inch of trunk diameter. ○ Every other day for 2 months – Depending on temperature and wind, apply 2-4 gallons per inch of trunk diameter. ○ Weekly until established (one to two or more seasons).
2-4-inch caliper	<ul style="list-style-type: none"> ○ Daily for 4 weeks – Depending on temperature and wind, apply 1-2 gallons per inch of trunk diameter. ○ Every other day for 3 months – Depending on temperature and wind, apply 2-4 gallons per inch of trunk diameter. ○ Weekly until established (two to four or more seasons).
>4-inch caliper	<ul style="list-style-type: none"> ○ Daily for 6 weeks – Depending on temperature and wind, apply 1-2 gallons per inch of trunk diameter. ○ Every other day for 5 months– Depending on temperature and wind, apply 2-4 gallons per inch of trunk diameter. ○ Weekly until established (four or more seasons).

- **Check the actual water need before watering.** A common mistake on compacted and clayey soils (with poor drainage) is to apply too much water per irrigation, waterlogging the planting hole. Never apply irrigation if soil is saturated.
- Trunk diameter on small trees is measured at six inches above the soil line.
- As a rule of thumb for Hardiness Zones 4 and 5, establishment takes one season per inch of trunk caliper.
- In Colorado winters without routine moisture, water newly planted trees monthly. However, do not water if the ground is frozen.
- In our dry, semi-arid climate, there is benefit from applying additional irrigation outside the root-ball area. This can be done with a ringed soil berm that allows water to percolate into the soil or a soaker-type hose running around the backfill area.

Mulch to Protect Tree from Lawnmowers, Weed Eaters, and Grass Competition

Wood/bark-chip mulch is highly recommended on newly planted trees. The mulch protects the trees from lawn mower and weed eater injury. Trees with a mulch ring typically have 20% more early growth compared to trees where grass grows up to the trunk. This is due to the lack of competition with the grass and/or weeds.

In a landscape setting, the mulch ring is typically two to four feet wide up to the width of the dripline (spread of branches). Wood chip mulch three to four inches deep gives better weed control and prevents additional soil compaction by foot traffic.

On newly planted trees, do not mulch over the root ball. On established trees, keep mulch back six inches from the trunk. Never pile wood/bark chips up against the

trunk. Wet chips can lead to bark decay. Never make mulch volcanoes! On wet sites, mulching may help hold excessive soil moisture and may be undesirable. On open windy sites, wood/bark-chip mulch blows away.

Fertilization

During the establishment phase, fertilization needs are none to minimal on woody plants. High-nitrogen fertilization rebalances the canopy-to-root growth ratio, encouraging canopy growth at the expense of root growth.

In situations where soil fertility is low—but water and other growth factors are not limiting—very light fertilization with a time-release product may be acceptable. Never use a quick-release fertilizer on trees.

Never fertilize trees in the establishment phase that are showing signs of stress. When a nonestablished tree is under stress, nitrogen fertilizer can push out canopy growth that the root system cannot support in hot windy weather. Woody plants do not respond to “starter fertilizers” like herbaceous plants.

Pruning

In the establishment phase of a tree’s life cycle, pruning is undesirable. Pruning lowers the levels of auxin, a hormone produced in the canopy terminal buds that stimulates root growth.

Pruning should be limited to the removal of dead and broken branches and minimal pruning to maintain a single leader. In purchasing trees, select trees with good structure that will not require immediate pruning.

Structural training for the tree continues in the growth phase (after the roots have established and the canopy shows significant annual growth). For additional information on structural training, refer to *CMG GardenNotes* #614, Structural Pruning of Young Shade Trees.

In situations where trees will not receive any structural training while young, it may be desirable to correct structural major defects as part of the planting process. This is primarily removal of codominant trunks and spacing of secondary trunks. However, major pruning at planting will slow root establishment.

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