



CMG GardenNotes #635

Care of Recently Planted Trees

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Root Establishment Phase

During tree establishment, primary growth occurs in the root system, with limited growth in the canopy. The science of planting trees is aimed at encouraging root growth and reducing post-planting stress. For additional information, refer to CMG GardenNotes #633, *The Science of Planting Trees*.

Depending on the size of the tree, it may take several years to fully establish its root system. Nursery trees are generally identified by their trunk caliper, measured six inches above the top of the root ball. A one-inch caliper tree will take 12-18 months to establish its root system following planting; a four-inch caliper tree will take four to six years. Cooler areas at higher elevations may take even longer.

It is difficult to determine when a tree is established following planting, but a sign can be a significant increase in annual twig growth, which indicates that roots have become established and that the tree is shifting into the growth phase. The purpose of this *GardenNote* is to summarize tree care during the establishment phase.

Containerized trees allow planting from spring to fall, if irrigation is available to promote tree establishment. Trees planted in the spring or early summer have a longer period to establish roots, but planting in late summer or early fall can also be successful, if irrigation can be provided until the ground freezes. All trees will benefit from fall and winter watering – refer to the section below.

Watering

Regular irrigation after planting encourages root development for tree establishment. Under-irrigation often leads to slow establishment, canopy dieback, and bark splits (frost cracks and sunscald) on the trunk. Recently planted trees and shrubs can establish quickly with light, frequent irrigation applied directly to the root ball.

Refer to **Table 1** for frequency and the volume of irrigation based on the size of tree planted. This information has been taken from the University of Minnesota publication, [Watering Newly Planted Trees and Shrubs](#), by Kathy Zuzek. **Table 2** provides more detailed information based on the size of the tree planted and irrigation requirements.

Table 1. Irrigation and establishment time of newly planted trees based on caliper size.

Caliper size (measured 6 inches above the top of the root ball)	Gallons of water to apply at each irrigation	Root establishment time
One inch	1 to 1.5 gallons	1 to 1.5 years
Two inches	2 to 3 gallons	2 to 3 years
Three inches	3 to 4.5 gallons	3 to 4.5 years
Four inches	4 to 6 gallons	4 to 6 years
Five inches	5 to 7.5 gallons	5 to 7.5 years
Six inches	6 to 9 gallons	6 to 9 years

Frequency of irrigation should be applied as follows:

- 1-2 weeks after planting, water daily.
- 3-12 weeks after planting, water every 2 to 3 days.
- After 12 weeks, water weekly until roots are established.

Larger volumes of water applied infrequently may result in drought-stressed roots. Soil amendments added at planting do not reduce the need for frequent irrigation. Drought-tolerant and native species are not drought-tolerant until the root system becomes established - watering recommendations from Table 1 should be followed. In sites without ideal irrigation management, smaller-sized nursery stock and waterwise and native species should be considered.

When watering newly planted 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. Monitor irrigation if the tree is planted in a newly sodded/seeded irrigated lawn.

Table 2. Estimated irrigation needs of newly planted trees and shrubs during the growing season.

Size of Nursery Stock	Irrigation Need for Vigor
<2-inch caliper	Daily for two weeks Every 2-3 days for two months Weekly until established
2-4-inch caliper	Daily for four weeks Every 2-3 days for three months Weekly until established
>4-inch caliper	Daily for six weeks Every other day for 5 months Weekly until established

Check if water is needed prior to irrigating; 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. In Colorado's dry, semi-arid climate, there is benefit from applying additional irrigation outside the root-ball area to maintain soil moisture in the rooting area.

Fall and Winter Watering

In Colorado winters without routine moisture, water newly planted trees monthly on sunny days when it is above 40 degrees F and the ground is not frozen. Water early in the day, if possible, to

allow water to soak into the ground before it freezes at night. Refer to CSU Extension Fact Sheet #7.211 *Fall and Winter Watering* for additional information.

Mulch

Apply mulch around newly planted trees to protect them from lawnmowers, string trimmers, and grass competition. Wood or bark chip mulch is highly recommended on newly planted trees. Trees with a mulch ring typically have 20% increased growth compared to trees where grass grows up to the trunk, which competes with the tree for resources.

In a landscape setting, the mulch ring is a minimum of two to four feet wide but can be up to the width of the dripline (spread of branches). Apply wood chip mulch at a depth of 4-5 inches thick, which provides better weed control, soil moisture retention, and helps prevent soil compaction.

On newly planted trees, do not place mulch on top of the root ball. On established trees, keep mulch at least six inches away from the trunk. Never pile wood/bark chips up against the trunk. For those in fire-prone areas, do not use organic mulch near homes or structures. Refer to CSU Fact Sheet #6.303 *Fire-Resistant Landscaping* for more information.

Fertilization

During the establishment phase, fertilization needs for newly planted trees are very minimal. Providing high-nitrogen fertilizer may encourage canopy growth at the expense of root growth. In situations where soil fertility is low, but water and other growth factors are not limiting, a half-rate fertilizer application with a time-release product may be acceptable.

Never fertilize trees in the establishment phase that are showing signs of stress. When an unestablished tree is under stress, fertilizers can push new growth that a stressed tree cannot support. Woody plants do not respond to “starter fertilizers” like herbaceous plants.

Pruning

Pruning should be limited to the removal of dead and broken branches and minimal pruning to maintain a single leader or to correct for poor branching structure. When 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 may slow root establishment.

Authors: Linda McMulkin, with Laurel Potts, Darrin Parmenter, Irene Shonle, and David Whiting, Colorado State University Extension. Reviewed August 2024 by Alison O'Connor.

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