

TREE AND SHRUB DECLINE IN THE LANDSCAPE

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Two of the more common causes for decline of trees and shrubs that we have observed in the landscape are poor water management and improper planting depth.

Proper water management is essential to the success of any landscape. This begins with a thorough pre-plant investigation of site and soil conditions and continues throughout the life of the project. Soil texture is an important factor and this can be determined through laboratory analysis. Conditions such as compaction, layering and gradation that can impact water movement must be evaluated in the field. A simple test for assessing drainage is to fill planting pits with water and then record the time it takes for the water to drain. If water remains in the pits for an extended period, then provisions for improving drainage should be undertaken. With the information obtained from the pre-plant site and soil evaluation, an educated decision can be made on the selection of proper plant material and soil amendments as well as the design of irrigation and drainage systems.

The selection of appropriate plant material for a given soil condition is often overlooked. Plants that demand good drainage such as boxwood, gardenia, birch, azalea and many others will need special attention if they are installed in soil that is high in silt and clay particles or is otherwise subject to consolidation and compaction. Another common problem that occurs is the mixing of plants that have varying water requirements. An example of this is the planting of a drought tolerant plant such as cotoneaster in an area with plants that have a high water requirement. The moisture and drainage requirements for plants can often be obtained from a good horticultural reference. The *Sunset Western Garden Book* is a good source for this information.

After planting, soil moisture can be monitored through routine inspection of the *subsoil and root balls*. This should be determined in a *number* of locations and irrigation frequency and duration should be based on moisture conditions found. A soil probe is useful for making this evaluation. For newly planted trees and shrubs, the soil should be moist to the touch. When squeezed gently in your hand, the soil should barely hold its form. Anything more than this is likely excessive; particularly if a root-rot pathogen is present. When the soil is saturated for an extended period, anaerobic conditions develop which lead to the release of toxic gases. Soils that are anaerobic are often steel blue in color and have a rotten egg smell. Common problem areas where soil moisture is likely to be high are where trees are installed in turf or where trees have ground covers and annuals planted below them. The water required to sustain the turf or smaller plantings is often detrimental to the tree. At the very least, turf or groundcovers should not be placed within a minimum 2 ft. radius around the trunk. The irrigation heads should also not be directed towards the base of the trunk.

During the establishment period, root balls can become dusty dry if water is not directed through the root ball. This is why we encourage that the constructed water berm be built around the outside edge of the original root ball and not on the edge of the planting pit. Another common problem that can cause root balls to become too dry is the placement of backfill soil on top of the root ball. Water will absorb into the backfill soil and may flow around the root ball of the plant, rather than penetrating.

As a rule, trees and shrubs should always be installed so that the *top of the root ball is at or slightly above final grade*. Planting pits should always be excavated to the depth of the root ball. This will ensure that the tree or shrub will not settle to a depth below grade. When installed too deeply, plants are subject to low oxygen stress that can weaken the plant and therefore lead to decline. The decline can be accelerated if soil moisture is high; especially when the backfill soil is fine in texture. In addition, the placement of soil over the root zone of existing trees and shrubs has a similar effect as planting too deeply. The plant experiences a sudden decrease in vital gas exchange that leads to decline through suffocation.

In summary, many of the common problems that occur in the landscape are avoidable if reasonable care is taken to evaluate the site and soil conditions, select proper plant material and follow good irrigation practices. The following diagram is an installation guideline for container plant material.



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CONTAINER PLANTING GUIDELINES

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1. The top of the root ball should be at or slightly above final grade.
2. Planting pits should be at least twice the diameter of the root ball.
3. The root ball should rest on an unamended soil.
4. Construct the water basin on the inside of the outer edge of the root ball. This will permit water to flow through the root ball.
5. For poorly draining soils, auger a 4" minimum diameter hole 24-36" deep, or to a free draining layer, and fill the hole with washed plaster sand. Taper the bottom of the planting pit to allow good water movement.
6. Backfill mix options:
 - a. If desired the backfill mix in the upper 12" surrounding the root ball should be amended with not more than 30% organic matter.
 - b. Slow release fertilizer may be added at recommended rates.
 - c. The root ball may be covered with a coarse organic mulch to maximize 2" depth.
 - d. To enhance water movement, loosen the native soil beneath the root ball. Do not add organic to the soil beneath the root ball.

