a voice for the natural landscaping movement

Wild Ones®
Native Plants, Natural Landscapes

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Planting:

Doing Right by Trees and Shrubs

How Trees and Shrubs "Breathe"

By Fran Gustman

High school botany has taught us that leaves take in CO^2 and use it to photosynthesize, thus producing food. However, many people don't know that plants also take in oxygen, through all their surfaces – leaves, stems, trunks and roots. The oxygen is used as fuel for energy and produces carbon dioxide.

The root of a plant can survive lower levels of oxygen and higher carbon dioxide levels than trunk tissues. After all, roots are designed to be below the surface. A tree's fibrous roots are generally less than two feet deep, stretching like a pancake around the trunk. Oxygen filters downward through the soil particles to the root hairs. Carbon dioxide moves upward until it is expelled into the air. Growth slows if there is too much carbon dioxide around the root tips. If root tips cannot expand into new soil because of pavement or because the soil is compacted, the tree experiences the equivalent of being "pot-bound" – eventually the rootlets smother and the tree dies.

Large buttress roots generally fill the diameter equal to that of the canopy but feeding rootlets extend way beyond the branch system. In fact, a tree's stability is primarily the result of the wide horizontal spread of the roots. Sixty percent of the roots are outside the drip line—the root system of one willow specimen was the length of a football field!

Purchasing

Start out with a healthy plant. Inspect the roots before planting. Poor culture will be manifested by such symptoms as soil above the root collar, which causes trunk rot, root circling, and weak growth of the fibrous roots.

Proper Planting

When a tree or shrub is planted too deeply, the weight of the fill can compact the soil below

to make it as impervious as asphalt. The tree may even die of drought in a season of plentiful rain. Under too much fill, roots also smother or the cells in the trunk will die from lack of oxygen and the tree will be girdled.

Improper planting is a major cause of tree death. Common planting mistakes include compacted soil, excessive depth, constricted area for root spread, burlap or wire remaining on the root ball, and root-circling. Roots under stress will head upwards and circle. Eventually as their girth expands, their boa constrictor-like grip may choke off circulation of the trunk or of other roots. [Continued on page 2.]

This is what you should *not* do. "Mulch volcanoes" create "lollipop trees." Copyright: Virginia Cooperative Extension.

[Continued from page 1.]

Symptoms

The first symptoms of poor planting will be scorched and smaller leaves, defoliation, and branch dieback. A first symptom that water is not reaching the roots will be in the crown, (because it is the area farthest from the root system), including yellowing, wilting or curling leaves. The tree may show symptoms after one year or it may take over twenty years, depending on factors such as the depth of planting, texture of the fill, wetness, and the species.

Correct Planting

It used to be recommended that the hole be made deep and narrow and filled with amendments. It is now recommended that the hole be shallow and saucer-shaped and no deeper than the root ball. The tree or shrub should rest on solid ground to prevent settling. If the hole is too deep add dirt and tamp it down. The trunk flare (where the roots spread from the trunk) must be above the soil. The hole should be three to five times the width of the root ball with the roots spread out horizontally. Don't amend the soil, unless it is very poor, or the roots will prefer to remain in their comfortable home rather than leaving in search of nutrients and water.

Add back half the soil and then add water to force soil particles into contact with the root hairs. The loose, newly aerated soil is holding lots of oxygen for the plant so don't step on or otherwise tamp it down. When the hole is full, add more water.

Smaller plants typically catch up quickly to larger plants planted at the same time.

Watering

A field-dug tree has only 5 to 10 percent of its root system remaining and is not able to find sufficient water for itself. A new tree should receive five gallons of water a week for each one inch in diameter, so a 3-inch caliper tree should receive fifteen gallons.

A drought is defined as a condition in which the top six inches of the soil is dry for eight weeks or more. Much of the country is currently experiencing drought. Even established plants need to be monitored for water.

People often do not think to water trees. They appear so self-sufficient. However, a plant that has survived a drought will not necessarily be able to survive the next stress, whether it is a lack of water or an infestation of insects or disease.

Around young trees, it is a good idea to use mulch and to wait a few years to plant ground covers, which compete for water and nutrients.

Mulch also helps to conserve water. Don't make a volcano of mulch around your tree! Two to four inches is plenty. Besides looking completely unnatural, too much mulch provides a well-appreciated home for voles and other rodents that gnaw on the trunks. And don't let the mulch touch the bark – constant contact with the moisture in the mulch encourages rot and infestation of disease and insects.

Siting

Be kind to your green-leaved friends. Trees planted alongside roads must survive road glare, salt, and compaction. Plant trees on the house side of a sidewalk whenever you can, to keep them farther from traffic. Irrigation will be better there and there will be more space for root spread. Towns may plant trees on private property rather than on the sidewalk grass strip, if requested.

Besides the aesthetic benefits, trees also provide needed shade. Cities are typically ten degrees warmer than suburbs and have been getting warmer by one degree per decade. If one tree is planted for every ten parking spaces, trees will even cool a parking lot. ☘

Fran Gustman is a past editor of the Wild Ones Journal.

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