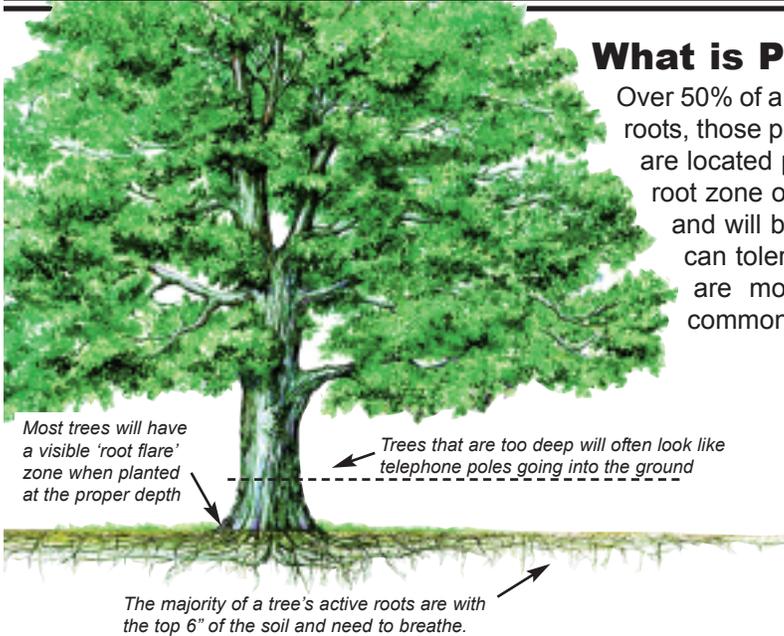


# Using an AIR-SPADE® to Establish Proper Root Depth



## What is Proper Root Depth?

Over 50% of a tree's living tissue is found below the ground. The active roots, those providing the vast majority of a tree's water and nutrients, are located primarily in the top 6" of soil. If soil is added around the root zone of an established tree these roots can become too deep and will begin to affect the health of the tree. Some tree species can tolerate some amount of soil added over their roots, others are more sensitive and cannot. Improper root depth is a common problem for trees in urban environments.

## Common Symptoms of Improper Root Depth:

- ▶ Dieback from the top of the tree
- ▶ Early fall color
- ▶ Sprouting or suckering from base of the tree
- ▶ Decay near base of the tree
- ▶ Increased likelihood of Stem Girdling Roots
- ▶ Weakened or thin canopy



## Why is Proper Root Depth Important?

A tree's roots need to breathe air as we do which is the primary reason they are found so close to the soil surface. If they are deeper than a few feet the available air begins to decrease and the root will suffocate.

Forest trees do not often have issues with planting depth as a naturally sprouting seed could only become established at the proper soil depth. Urban trees, however, are often planted too deep when they are installed and are also more likely to have soil grade changes occur after they are established. Even adding a few inches of soil atop an existing root system can cause a tree to begin to decline.

Decline from grade changes and improper planting depth can take several years to visibly affect a tree's health, making them a difficult problem to properly diagnose and correct.

**AIR-SPADE**

# How Can the Planting Depth be Corrected?



The Air-Spade is an air powered tool that allows an arborist to remove, excavate, or aerate soil without damage to sensitive roots.

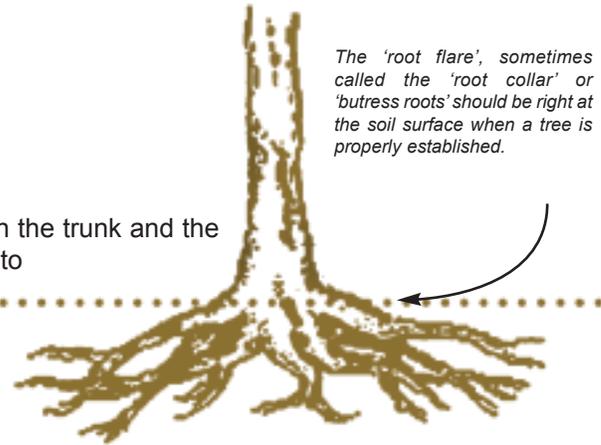
## AIR-SPADE

To correct improper planting depth the soil must be removed from around the root zone. It is important that this soil be removed in a manner which is not destructive to the sensitive roots. For this reason, an arborist will use an AIR-SPADE to remove the soil.

Using an air compressor, the AIR-SPADE's specialized nozzle forces air into the soil at 2X the speed of sound. This supersonic air flow can be utilized to reduce soil compaction, increase aeration, and can be used to incorporate organic matter into existing urban soils without damage to the sensitive roots. The AIR-SPADE allows the arborist to physically remove excessive soil so the roots are once again just a few inches from the top of the soil.

## How should it look?

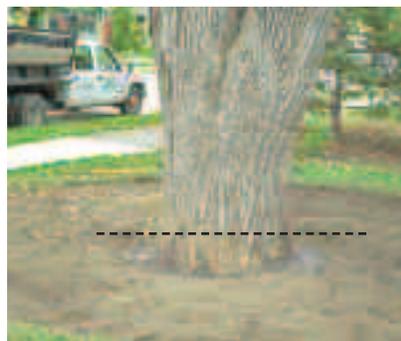
Trees have a zone, known as the 'root flare', that occurs between the trunk and the start of the roots. This area must be at the soil surface for a tree to thrive in any situation. If this area is below the soil line, the excess soil must be removed by an arborist using an AIR-SPADE. After the excess soil is removed an arborist will often recommend the addition of a thin layer of mulch. Mulch will act as a weed barrier and has been shown to greatly improve soil conditions favorable to healthy root growth.



The 'root flare', sometimes called the 'root collar' or 'butress roots' should be right at the soil surface when a tree is properly established.



Although this tree is mature it has no visible root flare, a sign that the tree may be too deep. This, combined with a thin appearance to the canopy, prompted a root collar inspection.



A root collar inspection revealed this tree to be too deep. Nearly a foot of soil was removed around the tree using an AIR-SPADE tool. The dotted line shows the original soil grade.



The finished treatment. This oak tree's roots are now closer to the surface where they will have greater access to the air they need. A layer of organic mulch was added to the completed project.