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Implications of planting tree too deep

By Toso Bozic

As tree planting season is already underway, planting container and balled-and-burlapped (B&B) trees too deep is a common and often overlooked mistake that can have serious long-term consequences for tree health and longevity. This practice, frequently observed on farms, acreages, and in residential and commercial landscaping, results from a misunderstanding of proper planting techniques. Planting a tree too deep or too shallow can lead to various issues, especially in heavy clay soils.

Trees planted too deep suffer from a range of issues, including poor root development, disease susceptibility, and an overall reduced lifespan. Planting too deep will suffocate the roots, while planting too shallow may expose them to extreme temperatures and hinder stability. Trees that are not thriving due to deep planting require more care, including frequent fertilization, watering, and pest control. In severe cases, trees may need to be removed and replaced, which is costly.

Causes

Through my experience of providing education as well as troubleshooting/inspection with tree decline and mortality of tree planting projects; there are several reasons why trees are often planted too deeply. These include:

- **Lack of knowledge:** Many people are simply unaware of the correct planting depth. The misconception that deeper planting provides more stability and better access to soil nutrients can lead to trees being buried too far below the surface.
- **No soil preparation:** planting trees where there is lack site/soil preparation leads to misunderstanding of the soil layers and their relationship with tree roots. Vast majority (80-90 %) of the tree roots are in topsoil layer and not deeper soil layers. With no soil preparation, there is tendency for deep tree planting. [Soil preparation](#) is crucial.
- **No sufficient size of planting hole** – planting hole should be two to three times wider than root ball of planted trees. Dig a hole as deep as the roots and twice as wide, allowing new lateral roots to spread into the surrounding soil. For burlap-wrapped trees, place them in the hole, remove the burlap, and cut the wire on top before filling the hole with soil.
- **Settling of soil:** After planting, soil can settle around the base of the tree, causing it to sit deeper than intended, it is especially common in areas with heavy or compacted soils.
- **Non-removal of additional soil** in potted and B&B provided by tree grower. For container-grown or B&B trees, carefully remove any excess soil that may be covering the root flare. Removal of additional soil ensures that the tree is planted at the correct depth. Many people don't remove the excess of additional soil around root flare and consider planting depth based on the depth of the pot or B & B.



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Symptoms

Trees that are planted too deep exhibit a variety of symptoms that can indicate distress, wilting, dieback, development of adventitious roots, reduce tree growth and vigour. Planting too deep restricts the amount of water and oxygen to the fine root systems, lowering the trees vitality. Trees planted too deep are also more subject to canker development and wind throw. There are several signs of deep planting including:

- **Absence of root flare** is one the first signs of deep root planting. The root flare is the area where the tree trunk widens at the base and meets the roots. If this flare is not visible above ground, it is a clear sign the tree is planted too deeply.
- **Poor health and growth** symptoms on trees planted too deep often exhibit stunted, appears sparse, leaning and not put on much new growth each year.
- **Girdling roots** are very common especially in heavy clay soils roots can grow in a circular pattern around the trunk rather than spreading outward. These girdling roots can strangle the tree, cutting off the flow of water and nutrients.
- **Fungal infections** due to excessive soil moisture around the trunk can create a conducive environment for fungal infections, which often manifest as cankers or rot at the base of the tree.
- **Leaf chlorosis and premature leaf drop** can occur due to insufficient oxygen to the roots which can lead to chlorosis, where leaves turn yellow due to lack of chlorophyll. Trees may also drop their leaves prematurely.



Picture 1: Trees planted several inches too deep (L) root bound due to deep planting (C), spruce tree leaning, showing poor growth and vigour due to too deep planting (R)



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Management

To avoid the pitfalls of deep planting, it is essential to [follow correct planting techniques](#). These steps ensure that trees are planted at the appropriate depth and can establish a healthy root system:

- **Identify the root flare:** Before planting, identify the root flare of the tree. This is the point where the trunk transitions to the root system. Before placing the tree in the planting hole, locate the first level of primary lateral roots or root collar. Ensuring that root collar (root flare) should be at near or slightly above the soil surface. The root flare should be visible above the soil surface after planting.
- **Dig a proper planting hole:** The planting hole should be twice as wide as the root ball but no deeper than the root ball itself. This encourages roots to grow outward rather than downward.
- **Remove excess soil:** For container-grown or B&B trees, carefully remove any excess soil that may be covering the root flare. This ensures that the tree is planted at the correct depth.
- **Backfill with care:** Backfill the planting hole with the original soil, ensuring that it is not packed too tightly. Firm the soil gently to eliminate air pockets but avoid compacting it too much.

If a tree has already been planted too deep, excavation of the root flare by carefully remove soil from around the base of the tree to expose the root flare. Another option is vertical mulching which involves drilling holes around the tree's drip line and filling them with a mixture of soil and organic matter. It helps improve soil aeration and root growth. In some cases replanting where the tree is young and small enough, it may be feasible to dig up the tree and replant it at the correct depth.



Picture 2: Properly planted tree with root collar (red arrow) above the ground (L), larger planting hole with proper depth (C) and site preparation with proper tree planting of B&B trees



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