Extreme consequences of girdling: this tree was staked for too long, leading to girdling and structural failure. Photo by Cheyenne Urban Forestry.

Don't get girdled: Save your trees from strangling

Oh no! What's strangling my tree?

During the summer season, our large leafy friends are at the height of their activity for the year, allocating new growth to roots and branches and attracting humans and animals alike. Whether you are a tree owner, tree enthusiast, or simply an observer, you may conclude that these visitors are benign—but, unfortunately, that's not always the case. The activities of humans and wildlife, among other stressors, can result in damaging conditions such as tree girdling.

A tree strap, once used for support, is now girdling and killing this tree. Photo by Cheyenne Urban Forestry.

A young cottonwood in the same situation as the tree pictured to the left, this time with the strap removed. Photo by Cheyenne Urban Forestry.

What is girdling?

Girdling inhibits the flow of water and nutrients in a tree over time, resulting in damage or death. To understand how girdling affects a tree, let's explore some basic tree physiology. The inside of a tree consists of three main layers: the xylem, cambium, and phloem. The xylem and phloem are like veins—they transport water and sugars up and down the tree.

The cambium is the layer between the xylem and phloem, and is responsible for the continued growth and expansion of the tree. If something wraps around a tree tightly, like a girdle, the tree will continue to grow and expand into it, effectively crushing or severing the phloem, cambium, and xylem as it grows.

Like many agents of tree damage, the source of girdling falls into two categories: 1) human-caused and 2) environmental.

Human causes

Girdling caused by humans often involves lawnmower blight, weed fabric, and improper planting practices. **Lawnmower blight** refers to the mechanical damage that can occur to the base of trees during mowing or trimming. Blades and strings from lawnmowers and trimmers can easily damage or destroy the vital components of a tree, especially if the tree is young and small.

Care must also be taken when utilizing products like weed or **landscape fabric**. Trees planted in an area with landscape fabric often have trunks that outgrow the initial planting holes in the fabric, causing strain and eventually girdling.

Finally, **improper planting practices** can also contribute to girdling. Planting a tree is a fairly simple process if all the appropriate steps are taken; however, if not, your tree may run into serious problems. Ball-and-burlap (B&B) trees, for instance, come wrapped in a protective burlap sheet, usually accompanied by some sort of wire mesh. If these coverings are not removed, the tree will continue trying to grow but will be impeded and girdled by the burlap, the wire, or both. Care must also be taken once the tree is in the ground; twine or straps used to stake the tree upright can girdle if tied too tightly or if not removed after a season or two.

Environmental causes

Girdling scenarios not caused by human activity commonly involve wildlife damage, pests and diseases, and root growth.

Wildlife are a common sight in Wyoming, even in urban settings, and they have garnered quite a reputation for their preference for the pretty things in our flowerbeds. Unfortunately, they can also impact trees. Animals like rabbits, porcupines, and other small mammals can cause damage to all sizes and shapes of trees. Rabbits have been known to chew on smaller trees, while porcupines often strip the bark on any tree they deem fit for consumption. Deer are also a

The beginning of a circling root in a container-grown tree. This should be addressed before planting. Photo by Jacob Mares.

A girdling root that has been left to grow. Without proper care, this root may kill the tree. Photo by Jacob Mares.

common culprit of tree damage and girdling, especially from antler-rubbing on smaller trees.

Other biotic factors such as **pests and diseases** can cause girdling as well. Bark beetles that bore into the cambium layer often eat through large portions of the tree's vascular system, especially if populations are large. Other times, the beetles do not cause the majority of the damage; instead, they introduce pathogens like fungus that spread and "clog" the vascular system.

The final environmental factor is one that could also be induced by humans: girdling or **circling roots**. Circling roots are exactly what they sound like: they circle the base of the tree and can eventually girdle and kill the tree. Sometimes roots can go rogue, especially if a tree has been grown in a container or in a circumstance that naturally impedes root growth. Planting trees too deeply or piling mulch too high can also create circling roots.

Signs of girdling

So, how do you know if your tree is being girdled? The first step is to check for any obvious signs of damage. If you see any foreign objects stuck in the bark, sunken areas in a ring around the tree, or large sections of removed bark, then chances are your tree is being girdled.

Some conditions, like circling roots, are harder to diagnose. If you suspect that your tree has a circling root, gently excavate the soil around the base of your tree—you may just find the culprit! However, if you are unsure about what caused the damage, or need treatment options, contact a local ISA-certified arborist.

Prevention

While it may seem like everything is out to strangle your trees, the reality is that girdling can be identified and prevented fairly easily. Mechanical damage from lawnmowers, trimmers, and wildlife can usually be prevented with good cultural practices. Large mulch rings and plastic tree guards can keep lawn equipment and wildlife damage to a minimum.

Similarly, good cultural practices can prevent girdling from landscape fabric and improper planting. Ensure that fabric is removed, or a larger hole is cut as a tree grows larger, and follow appropriate guides for planting trees. For more information, check out the *Wyoming Tree Owner's Manual* at https://bit.ly/all-things-trees. Additional resources can be found on the Barnyards & Backyards "Trees & Shrubs" page at https://bit.ly/bb-tree-shrub.

Brady McNaughton is the community resource forester for the Wyoming State Forestry Division and an ISA-certified arborist. He can be reached at brady.mcnaughton@wyo.gov.

Mulching tips

When mulching, start 2–5 inches away from the trunk to prevent pest damage and disease. Create a large circle around the tree 2–4 inches deep.