

Ramsey County

Plant Trees at the Right Height To Protect against 'Girdling Root Syndrome'

Girdling root syndrome, a condition in which the roots of a tree encircle its trunk, shortens the lives of many trees. Despite the fact that numerous trees are lost to girdling root syndrome each year, however, the solution is simple: plant a tree at the right height.

Trees need to be planted at a specific height, and planting too deeply is the primary cause for girdling root syndrome. When that happens, the roots of the tree may partially or completely encircle the trunk above the root flare. The root flare is the wide base of the tree, the transition zone between a tree's trunk and roots. If you examine trees in a woods setting, you'll observe that the root flare is normally positioned partly above ground.

Encircling roots can cause the loss of a tree in two ways. First, when roots encircle the trunk above the root flare, the tree suffers a slow strangulation as the flow of sap to the roots is interrupted. This strangulation results in a small root system incapable of providing water and nutrients to the aboveground portion. In addition, a tree suffering from girdling root syndrome becomes increasingly poorly anchored, making it more likely to blow over in a storm.

Avoiding girdling root syndrome begins at the nursery or garden center. Girdling root syndrome is caused in part when a tree's root flare is covered by soil during improper harvesting or planting. If the root flare isn't visible on a tree you are considering buying, remove a small amount of soil to locate the root flare. If you must dig more

than an inch or so to find it, you might want to consider purchasing a different tree.

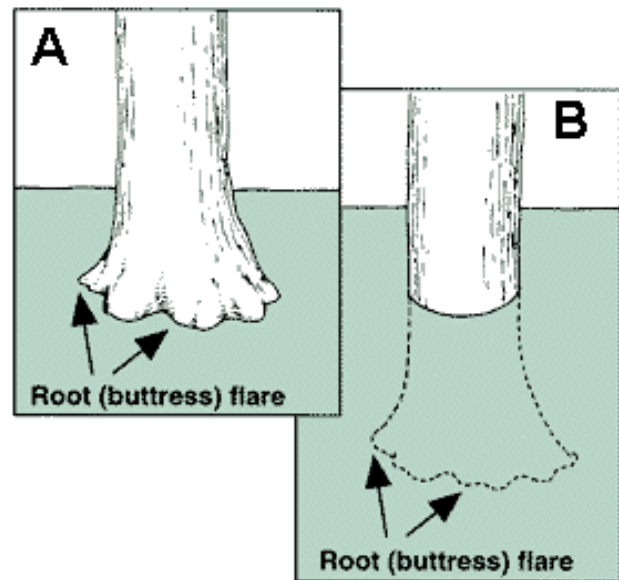
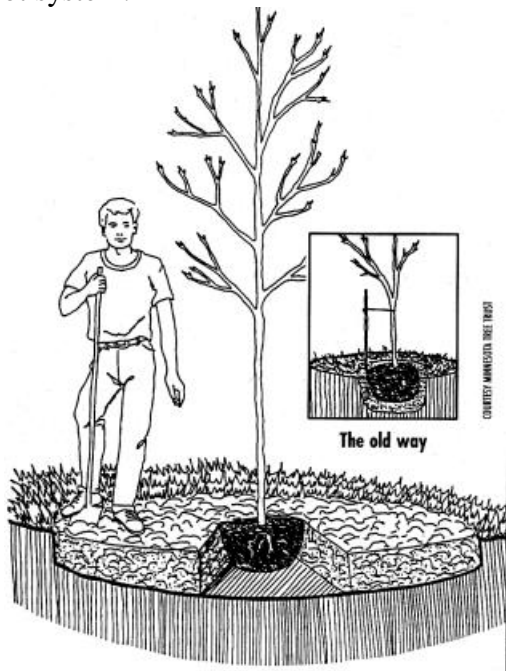


Figure A: Tree planted with root flare at the correct level, partially above ground. Planting at this height encourages a healthy, outward-spreading root system. **Figure B:** Root flare is covered by soil. Planting this deeply may result in roots that circle the trunk, eventually strangling it.

Once you have selected a healthy tree, take the time to plant it correctly. Gary Johnson, associate professor of Urban and Community Forestry at the University of Minnesota, and Cindy Ash, Director of Scientific Services at the American Phytopathological Society, offer the following advice:

- Inspect containerized and container-grown trees prior to planting to see if the roots are pot bound and circling around. Avoid the purchase of pot bound plants if possible.
- Prepare the site by removing the sod. Loosen the soil by tilling or spading an area three to

five times wider in diameter than the width of the root system, and only to the depth of the root system.



- Dig a hole in the center of this circle that is one foot larger in diameter than the root ball and is exactly as deep.
- Maintain undisturbed (not loosened) soil beneath the root ball to prevent the tree from settling.
- If the tree is somewhat pot bound, remove the pot and make a vertical slice up each quarter of the root ball to a depth of about one inch. Cut an X across the bottom of the soil ball as well. Gently loosen some of the roots.
- Carefully place the tree in the center of the hole and double-check that the root flare is just above the top of the soil. The uppermost root should be just below the soil surface.
- Backfill around the roots with the soil that was removed. Lightly pack or water the soil during this process to eliminate air pockets. Backfill to the height of the rootball, no higher.
- Mulch with four to six inches of coarse wood chips or shredded bark. Pull the mulch back from the trunk to prevent direct contact with the root flare and trunk.

- Water is very important to a newly planted tree. A slow, soil-saturating trickle a couple times a week is a good rule of thumb for a new tree, but varies depending on soil type and plant size.

Girdling root syndrome develops slowly. Early signs are reduced growth and smaller or scorched leaves (outer margins brown or yellow during the growing season). As the syndrome worsens, multiple symptoms appear. These include early fall color and leaf drop when other trees are green, leaning, and roots visibly girdling a tree's trunk. A late symptom is dieback (dead branches) in the tree's crown.

There are no figures on the success rate of treating trees with girdling root syndrome and treatment can be expensive. The best cure is prevention. To treat a tree with the syndrome, consult a certified arborist, a licensed tree care specialist, or a government forester.

For further information on tree selection, planting and maintenance:

Ramsey County residents may contact a Master Gardener volunteer by calling the Yard and Garden Line at 612-624-4771. Information by fax and pre-recorded messages on common yard care and gardening questions are available at Info-U at 612-624-2200.

For visual diagnosis of routine plant disorders (insect, disease and abiotic), bring samples to the Master Gardener Diagnostic Clinic, located at the Ramsey County Extension Office, 2020 White Bear Avenue, St. Paul. Clinic hours vary by season, but samples may be dropped off (weekdays, 8:00 a.m. to 4:30 p.m.).

By Doug Foulk, Horticulturist, University of Minnesota Extension Service.

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