



PURDUE UNIVERSITY

# Trees Need a Proper Start – Plant Them Right!

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## Root Flare

If your objective in tree planting is to grow healthy, long-lived trees, then keeping the bark above ground is vital. Lenticels in the bark are necessary for the exchange of oxygen and carbon dioxide within the tree's tissues. When tissue is below ground, gaseous exchange cannot take place, and trees become stressed and weakened. Also, bark that is underground on a deeply planted tree is constantly moist and subject to fungus, disease, and insects.

Roots need oxygen, which is more abundant in the top 18" of soil. A properly planted tree's roots will move laterally in this top layer of soil. However, roots on a deeply planted tree will grow vertically toward the surface searching for oxygen. These roots can encircle the tree and become girdling roots that interfere with the tree as it grows in diameter. If a tree is planted at the proper depth, its roots will not usually hamper tree growth.

A key step for proper tree planting is locating the root flare (Figure 1) which is the point where the



Figure 1. Root flare visible.



Figure 2. Trees with root flare.

trunk begins to spread out as it meets the roots growing underground. The presence of a root flare is noticeable on trees that have been planted by nature (Figure 2). Proper planting should mimic nature by keeping the trunk above ground and the anchor roots just below the surface (Figure 3). A tree without a root flare is a tree planted too deeply.

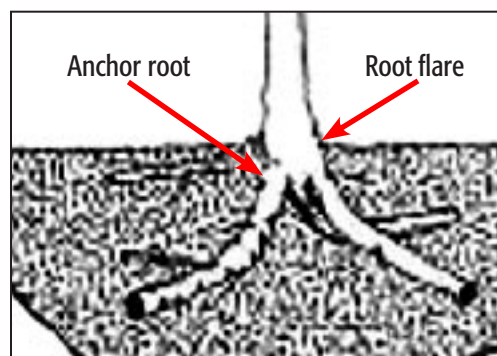


Figure 3. Position of root flare and anchor roots

## Steps to proper planting of a balled and burlapped (B&B) tree:

1. Place the tree next to the planting hole.
2. Determine the depth of the hole by locating the root flare within the root ball.
  - A. With wire cutters, remove the top 1/3 of the wire basket. It is needed to transport the tree, but it can be a detriment to root growth if left in place. Also, the top of the basket can be a tripping hazard if it protrudes through the soil.
  - B. Remove the ropes from around the trunk (Figure 4). Ropes left in place could girdle the tree if they are synthetic or if the tree grows faster than the ropes decompose.



Figure 4. Ropes around tree.

- C. Locate the root flare by removing the burlap and soil from the top of the root ball. Synthetic burlap should be removed completely because it will not decompose and the roots will not be able to grow outside the root ball and into the soil.
  - D. Measure the distance from the root flare to the bottom of the root ball. **This determines the depth of the hole.**
3. After locating the root flare, check for and remove girdling roots that are encircling the trunk. Use bypass pruners or a small saw to make a clean cut.
  4. Enlarge the width of the hole to two to three times the width of the root ball.
  5. Keep the bottom of the planting hole solid to prevent root ball from settling.

6. Plant the tree in hole. Return soil to hole and tamp in place around the root ball.

Soil removed from the top of the root flare can be spread around the roots once the tree is in place. Do not compact the soil by stomping around the root ball. Fill hole with soil only to root flare level.

7. Water thoroughly to remove air pockets. As the soil settles around the root ball, add more of the soil that was removed from the hole. Being careful not to add soil above the root flare.
8. Straighten the tree as needed during the planting process.
9. Spread mulch 3-4 inches deep in a circle around the tree that is 2-3 times the width of the planting hole, but not against the bark (Figure 5). Mulch reduces weed and grass competition and promotes root growth into the surrounding soil because the soil retains moisture under the mulch.



Figure 5. Keep mulch away from bark.

10. Staking and guying. It is usually not necessary to stake a tree unless it is a windy or sandy site. However, if staking is needed, there are three things to remember
  - A. Staking should allow the tree to move because the movement sends hormones to the roots causing them to grow which creates greater tree stability and promotes trunk taper and growth.
  - B. Guy wires around the tree should be checked periodically the first year to prevent girdling of branches or trunk (Figure 6).
  - C. Staking and guy wires should be removed after the first year.



Figure 6. Guy rope girdling tree

**Containerized and bare root trees.** The process of planting a tree with the root flare at ground level is the same whether the tree is B&B, containerized, or bare root.

**For more information contact:**

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