What is a "good" root system?©

C.E. Whitcomb[a]

Lacebark, Inc., PO Box 2383, Stillwater, Oklahoma 74076, USA.

Abstract

Lush green foliage and bright flowers continue to hold most of the attention of landscapers and homeowners purchasing nursery plants. Recently, roots have finally been getting some attention. However, there is a great deal of misinformation about just what constitutes a "good" root system. Often, what is touted is unnecessarily flawed. Based on numerous container research studies, I provide six examples of "good" root systems compared with flawed root systems.

Example 1: oak seedlings at three days after germination. A seedling with a good root system has already responded to air root pruning and formed many new roots. A seedling grown without air pruning continues to put all its energy into "one basket" by extending a single taproot downward.

Example 2: propagation containers with and without air pruning. A seedling root system in a container with air pruning will be branching at all levels along the container column. Without air pruning, a seedling has a few new roots near the bottom which will already be showing the problem of root circling.

Example 3: aeration and drainage. A well branched fibrous root system is produced in substrate with good aeration and drainage. However, poorly aerated substrate and inadequate drainage result in a poor root system.

Example 4: a tree after transplanting and growth in 3-gallon containers. A round container designed with ledges, directing ribs, and holes breaks the cycle of circling and stimulates new roots throughout the container column. Unfortunately, trees grown in conventional containers without ledges, ribs, and holes show the standard pattern of circling roots.

Example 5: trees after 3 to 5 years of production. A tree grown in a unique root-tip-trapping, fabric container shows internal branching with so many tiny, active root tips that it is difficult to count them all. However, when roots of trees grown using traditional ball and burlap systems are revealed, there are just a few large roots present, so there are few roots to support the tree and extend into surrounding soil after transplanting.

Example 6: the finishing stage of production of large specimen trees. Even at 5-inch diameter, trees grown using systems that promote root branching continue to show their fibrous root system potential. However, field-grown trees produced and harvested mechanically using conventional production methods show a meager support system with only a few large roots.

In nursery production, the ultimate growing site of a plant is not the container in which it is grown. Rather, plants are to be transplanted and expected to establish and grow. Often unknowingly, insufficient, non-branching, circling root systems created by standard container methods complicate the health of a plant for many years. However, with the proper growing techniques, roots can be produced that are fibrous, oriented for extension in all directions, and capable of helping the plant reach its full potential in an efficient manner.

[a]E-mail: carl@lacebarkinc.com