
Missoula County

Integrated Plant Management

Fact Sheet No. 3

What do Trees need to Survive?

WATER

Lack of water may be the greatest limiting factor to plant growth. However, too much water can suffocate roots. Lack/excess of water results in yellow and/or brown leaves.

CARBON DIOXIDE/OXYGEN

Roots and leaves require CO₂ and O₂ for normal function. Lack of O₂ causes yellow leaves and die-back of terminal branches.

SUNLIGHT

Trees have species-specific requirements for light; too little or too much can decrease overall growth, or cause leaf color change.

SOIL/NUTRIENTS

Each nutrient has a special job. Poor leaf color can mean a lack of one or more nutrients.

Even though a tree grows green leaves, it may not be reaching its maximum potential. Consider the following things that can be done to enhance a tree's growth:

\$ PROPER SITE SELECTION Match the tree with growing conditions. Geographic origin of seed affects management. Select stock that is native to a geographic region with growing conditions similar to Missoula County. Choose trees hardy to ZONE 4. Consider the tree's water, light and soil preferences. Soil depth, moisture-holding capacity, and pH affect growth.

\$ PRUNING By pruning out dead, dying and crisscrossing branches, the tree will focus its available resources into more productive growth. The best time to prune is **after** the tree has gone dormant and **before** bud break. Never remove >30% of total tree height. To reduce height, cut back to a lateral that is at least one-half the diameter of the branch you are cutting.

\$ WATERING Water requirements are affected by species, micro-site and type of irrigation. Exotic shade trees require an average of 30 to 40 inches of precipitation per year. Water wise species can lower moisture requirements immensely. Short, frequent watering may encourage shallow, surface roots. Water less frequently (weekly) for several hours.

\$ FERTILIZING Fertilizers provide urban trees with elements often lacking in disturbed sites. Tree fertilizers should only be used to promote normal growth. Never fertilize a stressed tree as it may cause the tree to use up its last food reserves and trigger early mortality.

\$ DIAGNOSING TREE PROBLEMS When a tree is planted in a new environment, it can encounter insect, disease or physical problems. Understanding how a tree grows will help diagnose problems.

\$ PLANTING INSTRUCTIONS Anticipate its full potential prior to planting. Accommodate the crown size and root characteristics. **Right Tree/Right Place** equals a longer-living tree. Dig a hole 6" wider than the root ball and plant at the same depth as it was in the nursery.

HOW A TREE GROWS

Photosynthesis - This process allows the tree to produce sugar for growth, and an essential by-product called oxygen .

Crown - All of the primary upward growth takes place in the outer tips of the crown. New Growth takes place in the buds at the ends of the twigs.
DON'T TOP TREES! IF YOU FEEL THE NEED TO TOP A TREE IT IS A GOOD REASON TO REMOVE AND REPLANT!

Leaves - These house all the necessary elements for photosynthesis. Trees can lose up to 50% of their leaves in a season before injury occurs. Trees defoliated mid-summer or earlier should be assisted in flushing a new set of leaves. A light fertilizer application and plenty of water may bounce the tree back, otherwise do not fertilize stressed trees.

Trunk - This supports the crown and produces the bulk of the useful wood. Injury to the trunk may limit the amount of nutrients and water getting to the leaves resulting in an overall yellowing of the crown and decline of tree health.

Annual Rings - These reveal the age of the tree and what type of annual growth has taken place each year.

Heartwood - This is old sapwood. It is now inactive and provides strength and rigidity to the tree.

Sapwood(xylem) - This carries sap, or water and nutrients from the roots to the leaves. Injury from disease, insects or poor pruning cuts may result in discolored leaves and poor growth.

Cambium - This is a layer of cells between the bark and the sapwood, where all diameter growth takes place in. (Annual rings are produced inside and bark on the outside).

Inner Bark(phloem) - This carries sugars/energy produced in the leaves down to the branches, trunk and roots where it is converted to elements necessary for growth. **DO NOT** cover pruning wounds with any types of sealant. If you really feel you need to darken a pruning cut or a wound, make sure it is not petroleum based. However, letting a tree seal naturally is the best method of all.

Outer Bark - This protects trees from insects and disease attacks and other injuries. Younger trees do not have as much protective capability as older ones so keep your lawnmowers and weed eaters off the bark and also keep thick turf from growing tight to the trunk.

Roots - These anchor the tree, transport water and nutrients, and help protect the soil from erosion. **Tree roots generally extend over twice the diameter of the crown.** 80-90% of the water uptake happens in the fine root hairs in the top 30 inches of soil. Water the entire area under the tree canopy and thoroughly soak to encourage the development of deep roots. Roots die if oxygen supplies are diminished by soil compaction, which can be caused by construction of paved areas over the roots and flooding.

