

What Every Tree Climber Needs to Know

For over 30 years I have been climbing around in the canopies of thousands of trees. I have had the opportunity to observe first hand how trees respond to various kinds of pruning techniques. Many of you are climbers, and as we climb up and move through a tree the results of good and bad pruning techniques are right there in front of us, we can observe how the tree responded to the type of pruning that was done.

Some of the best advice I ever received was from an old climber who told me when I first started pruning trees. ***“Every time you go into a tree, open your eyes and discover what you can learn from the tree”***. And he was right, if you pay attention you will be able to read a history of things that have happened to the tree and how the tree responded. Every tree has a history that is waiting to be unraveled. As tree climbers we are problem solvers, every tree has a unique set of problems and needs.

Our job is to determine the needs of the tree and the requirements of the situation and to perform pruning in a manner that will cause the tree to respond in the best possible way for its health and the situation.

The beauty of it is we can learn a huge amount about trees while we are being paid to climb around in them. If you then put the effort into learning and understanding tree biology, which teaches you scientifically how trees grow and how trees respond to wounding and why, it all begins to make sense and you have become an arborist!

Arborists prune with a plan and a purpose, they address the needs of each individual tree, they do not do assembly line pruning. A tree climber may know how to perform proper heading cuts, reduction cuts and thinning cuts. They may know how to cut to a collar or cut to a node, how to prevent ripping or tearing but if they do not know tree biology and how trees respond to various types of pruning, they may be pruning incorrectly and causing unnecessary damage to trees.

Let's consider the practice of removing the smaller interior branches of a tree that is some times referred to as “thinning”. Do these branches have a purpose and functional role they play for the tree? Or are they so much useless junk that merely gets in the climbers way? The interior branches of a tree are photosynthetically active; they produce carbohydrates for the trees use. In fact during the hottest part of the day when the exterior leaves are shutting down, the interior branches that are shaded are often able to continue producing carbohydrates for the tree's use and health.

The interior branches though smaller, are usually growing on large limbs and leaders. The carbohydrates produced by these smaller branches are stored near by in the large limbs and leaders. This energy source is used to add diameter and strength to the large limbs. This energy source is also used to wall off decay from wounds incurred on the large limbs; the prevention of decay in these major limbs is critical to the prevention of limb failure and the longevity of the entire tree. The smaller interior branches are also, often the closest source of carbohydrates for the roots of the tree and the rhizome area around the roots that feed the microbes in the soil.

How does the tree respond when the interior branches are removed from the large leaders? First the tree must expend energy in the attempt to compartmentalize and stop invading decay for each branch that is removed. When many wounds are made on large leaders by removing the interior branches, a significant expenditure of energy is required to wall off decay. The tree usually responds to being stripped out by producing many sprouts to replace the foliage that was removed. Producing and pushing out large amounts of sprouts requires another significant expenditure of energy.

The sprouts themselves are another problem, they are only connected to the outer most layer of xylem wood, which is a weak attachment point and since they are not connected deeper into the wood they have a limited area in which to store the carbohydrates they produce.

When a tree's source of carbohydrate production is reduced and the tree is then require to expend carbohydrates for protection and recovery the tree often faces a shortage that can be sever. The tree may respond by limiting the production of chemical defenses that protect it against insects and disease. The compartmentalization process may be disrupted leaving large limbs and leaders more vulnerable to the spread of decay.

In older trees that have been striped out, I have seen many times small openings in a large leader, where a small branch was removed, and the small opening lead to a large cavity inside the leader. I'm sure many of you have seen this as well. Think with me for a moment, isn't it possible that the tree having been stripped of its interior source of carbohydrates, faced such a shortage of carbohydrates that it could not compartmentalize even a small branch wound and that small wound has lead to the destabilization of the entire leader. I think the evidence is there if you observe it and understand the process.

So let's review:

Removing significant amounts of interior foliage will-

1. Reduce photosynthesis during the time of day when photosynthesis is already reduced.
2. Reduce necessary carbohydrate storage in the large leaders of the tree.
3. Slow structural growth in large leaders of the tree.
4. Reduce the capacity to compartmentalize and stop decay in the large leaders of the tree.
5. Reduce the capacity to produce chemical defenses.
6. Produce sprouting which will further reduce energy reserves.

So let me restate my original question: "Do smaller interior branches have a purpose and functional role they play for the tree, or are they unimportant useless junk that merely gets in the way of the climber?" I will let you answer the question for yourself.

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