LEGACY ARBORIST SERVICES

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A Lesson on Tree Biology

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I have been an arborist and forester for more than 35 years. Over that time period, much has been learned about trees and how they work. Arboricultural research is constantly being conducted at universities and facilities such as Davey, Bartlett, US Forest Service, and others.

In the early pat of my career, we thought it was OK to top trees to reduce their size. You were supposed to apply a black tar-like substance after pruning limbs to "seal" the wounds. And, you were supposed to cut the branch flush with the trunk. In the late 1970s, a Dr. Alex Shigo (then with the US Forest Service Research Lab) unveiled a whole new way to look at trees which resulted in a change in the way we prune.

Dr. Shigo learned that trees have the ability to "compartmentalize" when trees are wounded to prevent the spread of decay. This means that trees go through a biological process where "walls" are developed to prevent the spread of decay up and down the stem or branch, outwardly toward the bark, inwardly toward the center, and radially through spoke-like vessels within the stem called rays. It was also learned that different species have varying abilities to compartmentalize better than others. For example, live oak trees are excellent compartmentalizers; decay is generally contained to a small area within the tree after a wounding event such as pruning. Laurel oaks and water oaks, on the other hand, are poor compartmentalizers; decay is often wide-spread within these trees, particularly in older and larger trees.

So what does this have to do with pruning? Dr. Shigo also learned that trees develop a "protection zone" where branches are attached to the trunk. Branches are attached to the tree trunk by interlocking branch and trunk tissue. A new layer of interlocking tissue is produced each year over the previous layers. A woody branch collar, produced by the trunk, holds the branch base. The collar is the swelling located at the base of a branch where the branch meets the trunk. When pruning a limb, it is important to stay just outside this branch collar; otherwise the tree's ability to compartmentalize is compromised. After pruning, callus tissue is formed from tissue within this collar. When a limb is pruned, the natural decay from the dead limb stops at this collar. Therefore, we no longer "flush cut" to the trunk because the branch collar has been breached and allows decay to enter into a previously protected area. Thus, depending upon the taper of the branch collar, it may appear that a "stub" of an inch or two has been left.

What about painting pruning cuts after pruning? Pruning paint is a petroleum-based product similar to tar or asphalt. It is thick and quickly seals the wound. However, Shigo's research discovered that the sealing effects of the paint served to hold in moisture thus creating a more conducive environment for decay. In addition, tree paint inhibits the tree's ability to create woundwood and begin the process of sealing over the wound. And, over time, the paint cracks

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and allows the decay organisms a path for entry into the wood anyway. Besides, placing a petroleum product on living tissue cannot be good for the tree. So don't let anyone sell you on the need to paint pruning cuts.

Speaking of woundwood and callus growth, trees technically do not "heal". Healing is a biological process where damaged tissue is replaced by like tissue. When we cut ourselves, our damaged skin is replaced with new skin. When a tree is pruned or wounded, the woundwood that forms and grows over the wound is not the same as the bark and wood that was initially damaged. Thus, trees do not heal themselves, they seal over the wound with new wood. The more healthy the tree, the more quickly this sealing over process can occur. The more quickly a tree seals over the wound, the less chance of decay entering the tree through the cut or wounded surface.

One more note on pruning wounds. Use caution when pruning large diameter limbs. Larger pruning cuts take longer to seal over than smaller diameter cuts. In addition, when pruning these limbs, an angled cut will create a much larger surface area resulting in a longer sealing process. The longer it takes for a tree to seal over, the greater the chance that decay will enter the wound. Pruning healthy large diameter limbs should be done only if absolutely necessary.

I will save topping of trees and the reasons and types of pruning for another discussion. Suffice it to say that trees are complex biological organisms and we continue to learn more about them as time goes on. Many myths are still prevalent in the tree care business and many practitioners continue to perpetuate these myths. Be sure to consult a Certified Arborist when making decisions regarding pruning or other maintenance practices for your trees.

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