Risk Evaluation of Branch Junctions

Performing a Visual Tree Inspection (VTA) requires investigation of the ground around the roots system, the root flares and the trunk. Now the VTA turns to the major branch junctions. This article will examine where these main branches join to the trunk. Most trees have healthy branch attachments with strong wood. Occasionally trees are damaged by ice, snow or wind, leaving a weak junction that can fail. Other damaging agents that lead to failure are animals, human interferance, construction equipment and poor growth characteristics of some species.

Performing a VTA for branch junctions is important; failure can cause harm to people or things because large portions of a tree fall. One cause of weakness in branch junctions is decay in the junction itself. The decay process in a damaged attachment is called **compartmentalization of decay in trees** (CODIT). As wood decays in the branch junction sometimes a hollow forms, in which animals and birds make homes. When wildlife inhabits the tree, it is one tell-tale sign that an area is decayed. Hollows are nice for wildlife but they may lead to catastophe for people. Cavities in branch junctions require investigation to evaluate deterioration that can cause limbs to become unstable, in which case the limb,or the tree needs to be removed.

Grass, weeds, fungal growths or small trees growing out of the junction may be another sign of a larger problem. Investigate any growth in the junction area: it may be in a superficial crevice that holds dirt and allows rootage for the growth, but it could also be sign of a larger problem.

The photo to the left shows a large fungal growth projecting from a decayed junction. Closer investigation revealed the presence of a major weakness which necessitated the tree's removal.

Sometimes the decay process rots out the entire core of a tree and the only external sign is a small growth from the junction. Any kind of growth projecting from a branch attachment should be inspected. A seemingly small area of dirt-like material, when it is probed with a small rod, may reveal a larger problem.

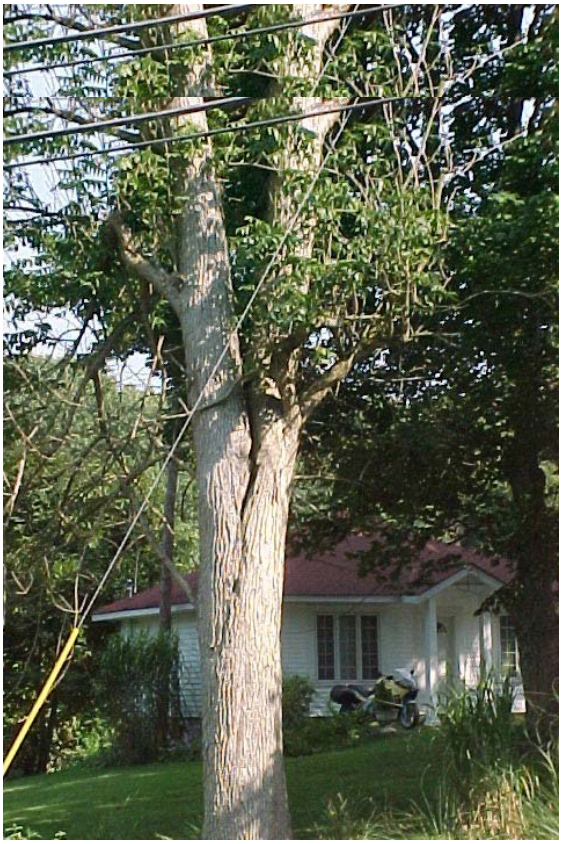
Tree species characteristics can also lead to failure. A good inspector should understand which trees are naturally prone to failure. Northern hackberries (*Celtis occidentalis*) and black cherries (*Prunus serotina*) are two examples of

species that are prone to natural flaws. Too-tight branch junctions with included bark are natural species flaws for these trees.

Included bark causes a tight junction, looking more like a "vee", than a 90 degree angle. This growth habit allows the bark to roll in on itself, therefore becoming "included". The presence of included bark is a sign of weak support in the junction because the wood cells are unable to bond together, instead forming a union with a crease. To understand what this crease looks like, consider the back of a human hand when the thumb is moved close to the forefinger. The formed crease and slight mound resembles a junction with included bark. When the thumb is moved away from the forefinger to a 90 degree angle, this resembles what a strong junction should look like.

One possible cure for a tree with included bark is the installation of cables for artifical support of the junction. The use of cables is an arboricultural process which is regulated by the ANSI A-300 standards. Copies of this standard and others for tree care can be purchased from the International Society of Arboriculture (ISA) http://www.isa-arbor.com or Tree Care Industry Association (TCIA) http://www.natlarb.com.

Branch junctions with cracks extending vertically down from the "vee" of the main attachment are another VTA problem to look for. The tree to the right has split and presents serious potential for harm. In fact, this crack extends all the way through the tree and actually splits horizontally across the grain, as well as vertically with the grain. Across grain cracking is a serious problem.



Cracks like this one are often caused by a heavy weight, like snow or ice, or by a sudden wind load. Particular species are prone to this kind of cracking so it is important to know tree species characteristics! If a crack runs down from the "vee" of the attachment, the tree is prone to further failure.

Offering artificial support with a cabling system or installing bracing rods, bolting the tree together, may offer remedy to mild forms of this kind of cracking (although not recommended for extreme cases like the tree in the photo). Remember that these cables and bacing rods should be installed under the direction of a Certified Arborist! One common error that people make is assuming that once a tree has been

cabled and braced it is "fixed"; in actuality, a cabled and braced tree should be monitored routinely for further decay and weakness.

This column has just barely touched on VTA of main branch junctions. There are many more situations which should be understood to properly perform a VTA. Realize that space constraints for this column only allow for a superficial explanation of the VTA process. The hope is to raise awareness of the need to inspect trees which are under your jurisdiction. Watch this column next issue for a a discussion of limb to limb attachments.

Note on the Author

Judson R Scott is a Registered Consulting Arborist (RCA #392) with the American Society of Consulting Arborists. As a RCA he advises Attorneys, Developers, Architects, Engineers, Builders, Insurance Companies, as well as homeowners concerning their trees and landscapes. Comments are welcomed! Jud can be reached at Vine & Branch INC. 317-846-1935 or by email at Treeconsultant@aol.com. Website www.vineandbranch.net