



## **CRACKS CAN CAUSE HAZARDS IN TREES**

As winter deepens, homeowners and property managers are advised by the Tree Care Industry Association (TCIA) that tree failure is a major cause of property damage. An ice storm or high wind can cause a cracked tree to fail under its own weight.

“Homeowners worried about trees falling and damaging property should call a professional arborist in for an inspection,” advised Tchukki Andersen, staff arborist with the TCIA. Andersen noted that trees are designed to withstand storms, but all trees can fail — and defective trees fail sooner than healthy ones. A sound tree becomes potentially dangerous when the tree’s woody structure is weakened by one or more defects. During storms, pre-existing defects predispose trees to failure.

One of the major warning signs of tree failure is a visible crack. Cracks form when the load exceeds the capacity of the stem to withstand the load. The vast majority of cracks are caused by improper closure of wounds, by the splitting of weak branch unions, or by flush-cut pruning. Cracks can occur in branches, stems or roots. The wood behind the crack may be sound, decayed or missing, as in a cavity. Several types of cracks can be found in trees and, like other defects, the severity of cracks ranges across a spectrum.

Vertical cracks run with the wood grain along the length of the tree and may appear as shear cracks, inrolled cracks or ribbed cracks. Horizontal cracks run across the wood grain. Shear cracks, a type of vertical crack, become hazardous when they go completely through the stem and separate the stem into two halves. As the tree bends and sways in the wind, one half of the stem slides over the other, elongating the crack. Eventually the enlarging crack causes the two halves of the stem to shear apart. A shear crack always has a high risk of failure.

An inrolled crack, also called a ram’s horn, has margins that curl inward on each of its sides and forms inrolled bark and wood. An inrolled crack is formed when a wound does not close properly. Serious decay is always associated with an inrolled crack because the crack margins rewrap the tree each year, allowing decay to spread rapidly. Inrolled cracks often generate other cracks in the same stem segment. Trees with an inrolled crack, advanced decay and another crack all in the same stem segment have a high risk of failure.

A professional arborist can determine the potential for failure by measuring the shell thickness in a few locations around the tree's circumference, determining the width of the crack opening and looking for the presence of any other type of crack. Ribbed cracks are created as the tree attempts to seal over a wound. Margins of the crack meet and mesh but are reopened due to tree movement or extremely cold temperatures. Thicker annual rings are created to stabilize the developing crack at the location of the crack. This forms the ribbed appearance over a period of many years. A ribbed crack has a high risk of failure when associated with another crack or with extensive advanced decay.

Horizontal cracks run across the grain of the wood and are formed when loading in the tree's crown pulls wood fibers apart. They are rarely found because they develop just before the trees fail. Horizontal cracks are a sign of imminent failure in leaning trees.

Cracks are hazardous when they compromise the structure of the tree by splitting the stem in two or when another defect, such as internal decay and a crack, do not provide enough sound wood in the outer shell to support the tree. The presence of multiple cracks and decay indicates a very defective tree.