

Ice Damage to Trees in the landscape

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The recent winter ice storm has resulted in extensive damage to many trees in our landscapes. While we may be tempted to cite this as an “Act of God” it is both a cyclic part of nature and the results of some of the landscape practices of the past. As I write this I am reminded of Thomas Edison, one of the most optimistic individuals in history. His “Invention Factory” in West Orange, NJ burned to the ground on Christmas Eve (1914). The next morning as he stood among the smoldering ruins he remarked to his associates, “All of our mistakes have been destroyed. In a new factory we can start our experiments with a clean slate.” Through the pain of loss and destruction we can and should learn.

Shaking Ice and Snow From Branches

As ice begins to accumulate on branches there is the natural tendency to do something to help save our landscape trees. If the branches on your tree or shrub have begun to bend over, resist the urge to go out and knock the ice or snow off. Plants have adapted over time to grow and tolerate a certain amount of bending. Mother Nature seems to do a fair job of restoring the form for most trees suffering this type of destruction. In an ice storm rain changes to ice and hangs on branches. At this point the stems have not yet frozen. Xylem, also known as “wood” is responsible for the upward conduction of water and mineral elements from the soil to the stems and leaves. It is only after branches have bent over that the ice freezes in these conductive tubes. If we remove the weight of ice quickly allowing the branch to spring back up, ice in the frozen conductive tubes shatters rupturing the cell walls. We see the same thing happening when we try to straighten a bent plastic straw with ice in it. Breakage of these conductive tubes is aggravated even more by the vigorous shaking needed to get the ice to fall off. While the plant may spring back into a more upright habit, the plant pays the price in the hot, dry summer months that follow. With many of the conductive tubes shattered, the plant is unable to move enough water from the roots to the foliage. Leaf scorch and twig death are the result.

In situations where breakage is a foregone conclusion, it is better to damage some of the conductive tubes and deal with that problem later rather than to lose the entire central leader on a tree. Small shrubs often recover rapidly if broken branches are pruned to the ground and allowed to sprout back. The decision to try to remove ice and snow can be a difficult. If removal is absolutely necessary it is always better to use cold water from a water hose to melt the ice than to shake the branch. In situations where the air temperature is close to freezing, water from a water hose is generally warm enough to melt some of the heavy load. Never use hot water. This will damage the plant you are trying to protect.

Dealing with Broken Branches

What to do when branches are broken depends on many factors. When we look at the physical failures of trees, some species fail more frequently than other species. The specific

way trees fail is also very species specific. Once a tree has failed, it is more likely to fail again at some point in the future. If the tree has suffered extensive damage and there is a high value target like a play area, home or driveway, it may be better to remove it and avoid the potential for future problems. If only a side branch has broken it can generally be removed without increasing the risk of future failures. While a hole may remain, it is better to have a slightly defective tree than to be without any tree. While advice from a professional arborist is valuable, the ultimate decision must rest with the owner of the tree.

Restoration Pruning or Removal

Restoration pruning is the term arborists use for the multi-year process of restoring the natural form of a damaged tree. The form will never be the same as what it would have been. The objective is to make the tree more attractive and reduce the risk of future failures. Risk can never be reduced to zero.

If a portion of the central leader has broken, it should be trimmed back to a lateral branch that is at least a third the diameter of the broken terminal. Preference should be given to lateral branches that are more upright but do not have included bark. Pruning back to a lateral that is too small will not have sufficient foliage to result in rapid wound closure. However, in catastrophic events such as ice storms we may have no choice but to prune to smaller laterals. If the tree is young and the side branch being trained into a new lateral is small, the lateral branch can be splinted to encourage upright growth. With time this lateral branch will form a new terminal. If splinting is done it is important that it be done in such a manner that girdling does not occur. Nylon stockings or cloth strips are sometimes used for holding the branch to the splint. Wires, even with a piece of hose pipe are never recommended.

It is not feasible or desirable to remove every damaged tree. The decision making objective is to remove the most damaged trees that present the highest risk for causing future property damage; provide mitigation for those that can be saved. Of those that receive restoration pruning, some will be destined for removal in the future as replacement trees reach sufficient size to be functional entities in the landscape.

The most frequently asked question about pruning is, “What is the best time of the year to prune?” The way a branch is removed is far more important in wound closure and future health of the tree than time of year. Maples, elms, birch, yellowwood and most conifers pruned at this time of year are going to bleed from these open wounds. Sap flow from wounds has never been shown to devitalize the plant. The sugary sap may attract bees. This is not a problem. On cold nights in spring a maple icicle may form. These are more of a curiosity than a problem with the more daring of us tasting the sweet sap of the maples.

“We Have Met the Enemy and He is Us”

This famous quote from the comic strip *Pogo* identifies the real cause of many of the failures during the recent ice storm. I was watching a live feed from a local television station in residential neighborhood. In the middle of the segment, seemingly on cue the tree behind the reporter suffered a major branch failure. The camera zoomed in on the now horizontal branch that had damaged the house. It was a silver maple (a.k.a. water maple or *Acer saccharinum*) that had been topped years before. The branch that failed was one that had regrown from a

trunk that had been topped. Silver maples produce wood that is less strong and more prone to decay than many other maples. This failure was a direct result of a home owner's mistaken impression that topping reduces potential for failure. Just the reverse is true. Topping causes failures.

Trees that have suffered extreme damage may not have lateral branches remaining. Without laterals the only choices are immediate removal, make topping cuts with plans to replace the tree within a couple of years or make topping cuts and accept liability into the future. Stubbing cuts are never recommended for the long term survival of any tree. Even though some new growth will develop at the point where the stubbing cut was made, decay will occur and spread down the trunk at a very rapid rate. Young branches that arise after a tree is topped are poorly attached and, in conjunction with the column of decay in the trunk will suffer significantly higher rates of breakage in the future. While the final decision on topping remains with the owner of the tree, so does the liability for future damage that may result.

Safety

The chainsaw is the most dangerous piece of equipment that homeowners are likely to use. It only takes a moment for a fatal or devastating accident to happen. The rate of chainsaw accidents is not tracked for nonprofessionals. The profession of arboriculture is the second most dangerous profession in the United States. Only commercial fishing is more dangerous. Every year the percent injuries and deaths per worker exceed firemen and police making tree care the most dangerous job in town. Professionals hired for cleanup work are required by OSHA to wear hardhats, ear and eye protection and, while working on the ground to wear chaps (leg protection). Homeowners are not required by law to use protective equipment but are foolish not to use this protective equipment and should never attempt work around utility lines or off the ground.

Individuals who hire someone to do cleanup or pruning work should insist on proof of insurance. Should something go contrary to plans and result in damage to your property or the property of others the property owner is responsible if the worker is not insured. Likewise, it is essential that anyone hired carry workman's comp insurance. If a worker is injured on the job it is the homeowner who is acting as the employer and thus becomes responsible for the cost of injury, rehabilitation and support until the injured worker is able to return to work. Hire competent professionals. Seeking an individual who is an ISA (International Society of Arboriculture) Certified Arborist is encouraged.

Different Strategies for Growth

River birches, silver maples, ornamental pears, willows and many other species have suffered disproportionately more damage from the weight of freezing rain. These species are often referred to as "cheap" trees. They grow rapidly, reproduce early and are relatively short lived. They have a "James Dean" philosophy on life - live fast and die young. They begin making seeds at an early age investing their energy reserves in reproduction instead of sound growth. The Matusula trees like the bur oak are long lived. They invest their energy reserves in slower growth that is more durable with reproduction starting at a later age. We Americans are an impatient lot. We want our trees to grow rapidly and are perplexed when they do not live long, in this case breaking apart in an ice storm. Mother Nature is just showing us the error of

our ways. We have planted our home landscapes and urban areas with too few species that grow too rapidly. Yes, river birch, silver maple and willows are attractive. But, we certainly over use them and grow them in ways and places that their genetic characteristics did not engineer them for.

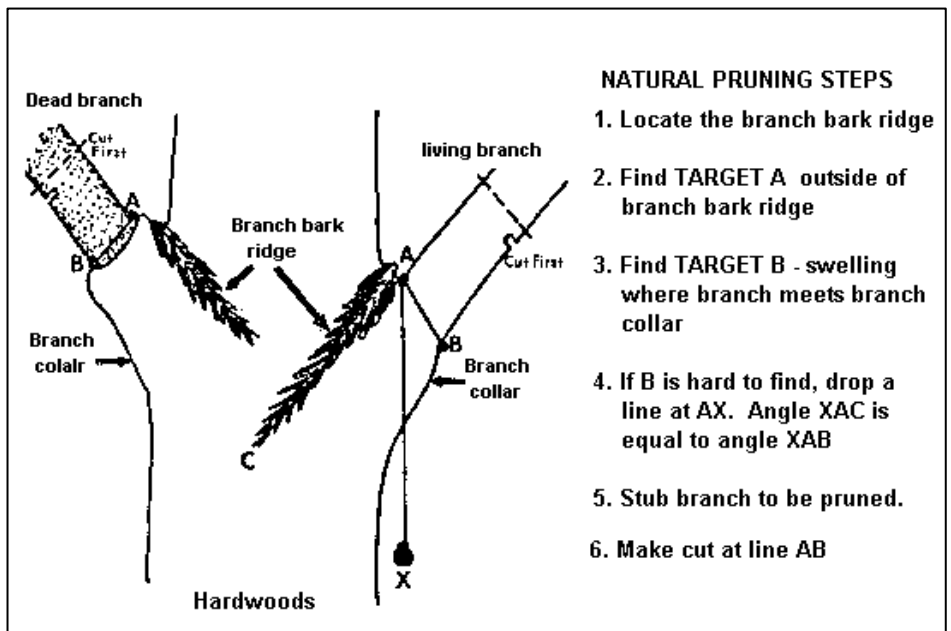
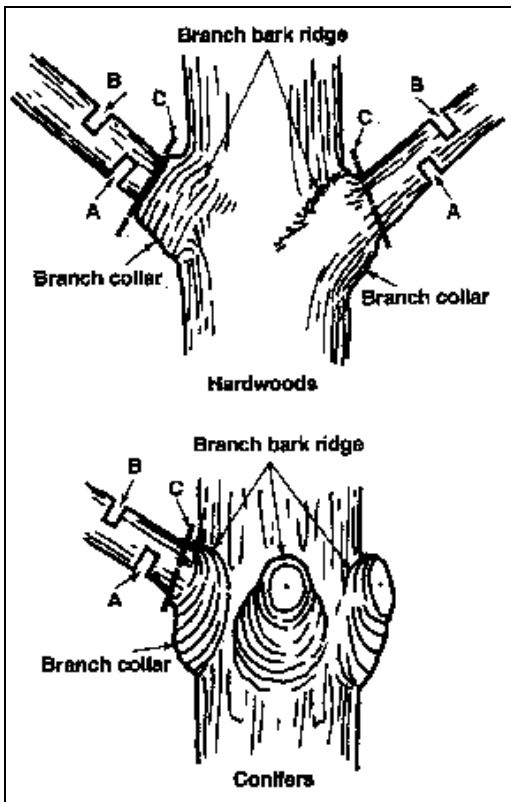
White pine also suffered extensive damage in landscapes. They grow rapidly and don't take many dollars out of the landscaping budget so have also been overused. While this species is listed as a Kentucky native, it is really more common as a northern species. It characteristically grows in a forest where it is adjacent to and protected by other white pines. As a result it does not produce the large number of lateral branches we see in more open landscapes. It is mainly these side branches that fail under these heavy loads of ice. White pines are more adapted to more northern parts of the country that generally does not experience freezing rains.

Some trees like pin oak and beech hold onto many of their old leaves until the following spring. Broadleaf evergreens like southern magnolia retain live leaves throughout the winter. This extra leaf surface allows for more surface area for freezing rain to collect. This added weight was more than enough to result in limb failure.

The Easter Freeze of 2007

Some branch failures can be traced back to another mean trick of Mother Nature. It will be two years ago this April when we experienced a record breaking plunge in temperature just as we thought spring had arrived. This freeze killed some or all of the flowers on many of our trees. As a result these plants did not produce any fruit in the fall of 2007. When something prevents a fruit crop from forming, it is common for that plant to over-produce flowers the following year. This happened in the spring of 2008 which also happened to be a good year for pollination. This resulted in an over abundance of fruit on trees like ash and crabapple. These fruit naturally persist well into the winter.

It is often hard for even experienced professional to determine why a specific tree suffered damage while others escaped. It is depressing to see our beautiful trees in pieces on the ground. It hits us in the family budget when the absence of a large shade tree on the south side of our house causes the air conditioner to work harder. We miss the memories of happier times but we need to remember that most of these large giants of the landscape were planted by others for our enjoyment. Though the groundhog saw his shadow, spring will come. Spring is a time of renewal and the traditional time for planting. This year make a resolution, it is never too late to plant a tree with a young person. As you begin to select new trees for your landscape look for durable, long-lived species. Amid the destruction, it is important to recognize the many important environmental benefits our big green companions contribute to our comfort and way of life. Trees, more than any other single factor are what make our homes and cities livable.



- NATURAL PRUNING STEPS**
1. Locate the branch bark ridge
 2. Find TARGET A outside of branch bark ridge
 3. Find TARGET B - swelling where branch meets branch collar
 4. If B is hard to find, drop a line at AX. Angle XAC is equal to angle XAB
 5. Stub branch to be pruned.
 6. Make cut at line AB