

Community Forestry Assistant



Newsletter

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Northwest
Management, Inc.

“Trees and Ice Storms”

Severe ice storms occur every year in the United States resulting in millions of dollars in monetary losses. Tree species vary in their resistance to ice accumulation. Certain characteristics, such as “included” bark, dead and decaying branches, a broad crown, and fine branching, increase a tree’s susceptibility to ice storm damage. Planting trees resistant to ice storms and performing regular tree maintenance to remove structural weaknesses will reduce damage caused by severe ice storms. Management plans for urban trees should incorporate information on the ice storm susceptibility of trees to limit potential ice damage, to reduce hazards resulting from ice damage, and to restore urban tree populations following ice storms.



**Spokane Ice Storm
1996**

Accumulations of ice can increase the branch weight of trees by 30 times or more. Ice formation generally ranges from a trace to 1 inch in additional stem diameter. Accumulations between 1/4 and 1/2 inch can cause small branches and weak limbs to break, while 1/2-inch to 1-inch accumulations can cause larger branches to break, resulting in extensive tree damage. Branch failure occurs when loading from the weight of ice exceeds wood resistance or when constant loading further stresses a weakened area in a branch. Included bark and woody decay enhance branch breakage and tree damage when ice accumulates on trees.

A number of characteristics increase a tree species’ susceptibility to ice storms: “included” bark, decaying or dead branches, increased surface area of lateral branches, broad crowns, and imbalanced crowns. Included bark results from in-grown bark in branch junctures. This weak connection enhances a tree’s susceptibility to breakage under ice-loading conditions. Decaying or dead branches are already weakened and have a high probability of breaking when loaded with ice. The surface area of lateral branches increases as the number of branches and the broadness of the crown increase. With an increased surface area, more ice can accumulate on lateral branches; the greater ice load results in greater branch failure. Contrary to popular belief, the wood strength of sound branches matters less than the ability of a tree to withstand breakage at branch junctures and the presence of fine branching or a broad crown that enhances ice accumulation.

Tree species resistant to ice damage can be planted to reduce tree and property damage from ice storms. Ice storm susceptibility should not be the sole criterion for selecting trees for urban planting, but the numbers of susceptible trees should be limited, particularly in regions with high frequencies of damaging ice storms. Proper tree placement and pruning on a regular cycle will reduce property damage and decrease a tree’s susceptibility to ice storms. Property damage from trees broken by ice accumulation can be reduced by locating trees where they can do the least damage. Those trees located near homes and other structures should be pruned and monitored for hazards. Trees pruned regularly from a young age should be more resistant to ice storms as a result of removal of structurally weak branches, decreased surface area of lateral branches, and decreased wind resistance. After storm damage has occurred, hazardous trees and branches require immediate removal to insure safety and prevent additional property damage. Trees that can be saved should have broken branches properly pruned to the branch collar; stubs and flush-cut pruning result in weakly attached sprouts and future insect and disease problems. Loose bark should be cut back only to where it is solidly attached to the tree.

The impact of ice storms can be minimized through planning, tree selection, and tree maintenance. Sustained efforts will undoubtedly reduce fatalities, injuries, monetary losses, tree damage, and cleanup costs to individuals and communities in regions where ice storms occur.

Article adapted from:

Richard J. Hauer, Mary C. Hruska, and Jeffrey O. Dawson. 1994. “Trees and Ice Storms – The Development of Ice Storm-Resistant Urban Tree Populations.” Special Publication 94-1, Department of Forestry, University of Illinois at Urbana-Champaign. Urbana, IL 61801. 12pp.

If you would like more information, please contact your local Idaho Department of Lands supported North Idaho Community Forestry Assistant, Northwest Management, Inc. at 208-883-4488.