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Marcescent Mania

Why do some trees keep their leaves all winter?
by Fred Tetreault, Public Information

Autumn's leafy color parade is over for the year, but a new tree-watching sport is in progress. It is a game that appeals to those fascinated by the reasons and dynamics causing some broad leaf deciduous trees to keep their leaves in the fall and winter.

The activity involves finding such trees and trying to identify them as "marcescent" species. Marcescent trees are those that hang onto their leaves throughout the fall and winter annually, rather than only occasionally in response to unusual conditions in a given year. Marcescent means "withered," referring to the fact that the leaves wither on those kinds of trees, just as they do on other species. But though these dried up leaves often become severely tattered in the winter winds, their stems remain firmly attached to the twig until spring.

A very old New England maxim claims the falling of oak leaves in autumn marks the time to pay bills. That would be a pretty good deal for the debtor, but less attractive to his creditors, since many oak species are marcescents. Among these in Illinois are the white, pin, shingle, blackjack and scarlet oaks.

Other Illinois marcescent species are blue beech, hornbeam, hop hornbeam and sometimes hawthorn, pecans, burr oak, black locust and sweetgums.

This phenomenon is not fully understood by science and neither is it uniform among the so-called marcescent varieties. For example, it occurs generally in younger trees, but in a patchy manner or not at all in older trees.

The process seems to have something to do with a species being in the wrong place at the wrong time — in other words, out of its natural, more southern range. As a result, the tree tends to keep on growing and producing leaves, rather than shutting down for the season, until the very cold weather arrives and it is too late to get ready for winter.

Leaves produce food — primarily sugars — to feed the tree. In most species, hormonal changes triggered by specific weather changes in the fall signify to the trees that the production season is over. The hormones begin forming a scar tissue — or more properly, an abscission layer — around the base of the leaf. The flow of sugars into the tree is shut off as the abscission slowly chokes off the route and their production ceases. Those sugars remaining in the leaf produce the fall leaf color.

Again in tune with climatic conditions, enzymes produced by the hormonal changes in the tree begin destroying the link between the leaf and its twig. The leaf eventually comes free from its mooring and falls.

In marcescent trees, leaf production continues unabated into the late fall. Hormones do not herald the season's end and the abscission or separation zone never forms. The tree continues producing sugars until freezing weather halts the process and the leaves wither and/or freeze in place. Without the abscission process to loosen them, the leaves remain so firmly attached not even heavy winds can dislodge their stems.

(cont'd. page 24)

(Marcescent Mania cont'd.)

According to Department of Conservation foresters, trees that hold their leaves through the fall and winter may be the result of an evolutionary failure. Such species may have originated in southern climes eons ago. Oak, for example, is known to have come originally from Mexico, which still has the most varieties of any location in the world.

Marcescent leaves serve a purpose. They may provide food for some wildlife species and they definitely act as a windbreak to reduce the exposure of tree dwelling creatures to the hazards of winter's frigid blasts. In addition, they have recreational value: An afternoon hike or automobile outing in search of marcescent trees, and attempting to correctly identify them, can be fun.

However, one stumbling block this year is the fact that an unusually large number of non-marcescent trees also got caught with their abscission layer down. Sweetgum, sycamore, silver maple, viburnum and forsythia (shrubs) and Siberian elms were among the species whose leaves froze irretrievably to their twigs.

"What happened was that we had a lot of wet and relatively warm days and nights and the trees didn't recognize that the growing season was over," Forester Dan Schmoker said. "Then, suddenly, we got a few days of hard freeze and the leaves died in place."

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Autumn catches some trees off guard and they continue producing sugars until freezing weather halts the process. When that occurs, leaves often-times will wither and/or freeze in place, remaining firmly attached to the tree throughout the winter months.

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