

Trees Losing Their Leaves in the Fall: The Natural Life Cycle of Plants

Our native woody plants (trees and shrubs) fall into two categories: evergreen and deciduous, the latter means they lose their leaves in the winter and then put on new growth on last year's stems. The majority of our woody species are in fact deciduous, but that doesn't mean they all behave the same.

The timing of leaf drop and of growing back new leaves varies from species to species as well as with the length of daylight, temperature and moisture, and even within those conditions, there is some variation among individual plants.

Some examples of species differences: Buckeyes (Texas and yellow) usually lose their leaves in August or early September. Walnuts start losing their leaves in September and are bare before most of our other trees begin to lose leaves. Then in the spring, elbowbush usually blooms in February and puts out leaves shortly after that, which is why it is also called Spring herald.

Of course, most of our deciduous trees lose their leaves in November and December with a lot of overlap among the species depending on weather conditions. The leaf color changes are caused by hormones reacting to length of daylight causing a reduction in chlorophyll production. When the green chlorophyll production ceases, the yellow pigments that are always in the leaf begin to show and a new red pigment is produced, thus giving us our fall colors. Once photosynthesis stops because of the absence of chlorophyll, other processes are triggered which cause the leaves to break away from the branches.

Of course, not all of our native trees and shrubs lose their leaves in the winter. Cedar (Ashe juniper) is obviously evergreen. Evergreen native shrubs include Texas mountain laurel, evergreen sumac, yaupon, cenizo, agarita, Texas madrone, and, some years, Texas persimmon and willow baccharis.

I left off live oak from the above list because, technically, it is not evergreen, but is semi-evergreen. It does lose its leaves every year, but in the spring, not in the fall, and the new leaves begin emerging at the same time as the old leaves fall, so the tree is leafless for only a very short time if at all. Mexican white oak is likewise semi-evergreen, although it undergoes leaf exchange a little earlier in the spring than do live oaks.

One might ask why are some trees deciduous and others evergreen? In areas farther north where the ground freezes, roots cannot grow to find water, and if the trees kept their leaves and continued to lose water from their leaves, the trees would wilt and die. Also, the cells of most tree leaves would be damaged if the water in them were to freeze. And finally, most deciduous trees are shaped in such a way that if they had leaves on in the winter, the weight of the snow would break their limbs.

So that raises another question: how do evergreen trees survive the winter? They have several characteristics which enable them to do so. Many evergreen trees have a waxy coating on the surface of the leaves to prevent loss of water during the winter. Others have cells with high concentrations of sugar which act as an antifreeze to prevent the cells from being damaged. Most of the evergreen trees in more northern locations are gymnosperms (pines, spruce, juniper, etc.) which have very fine needles with coatings and a limb structure that sheds snow.

The really amazing part of all of this is that it is the DNA within each cell of the tree that is programmed to produce certain structure types and certain hormones, and the hormones react to conditions of light, temperature and moisture, thus triggering changes in different cells that stop the production of certain chemicals and start the production of others. And, apparently, all the cells in every leaf of the tree undergo these changes at about the same time in an organism that has no brain and no nervous system.

And in the spring, the little bud produced last year has all the programming in its DNA to “know” when and how to begin making a new leaf and begin the process all over again. And for some trees, this process has been going on for literally hundreds of years—all programmed by the DNA in the original acorn or seed.

Nature is truly amazing.

Until next time...

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