A Plant's Survival Guide

As the days keep getting shorter and colder, we all start to think about surviving the winter. As humans, we might chop and stack wood for our woodstoves and fireplaces, and pull out our winter clothes, and can fruits and vegetables. But what do plants do in the winter to survive?

As any gardener knows, there are annuals and perennials in the plant world, and they each have their own unique way of surviving through the winter. Annuals survive only one year, and their species are dependent on the production of seeds to ensure survival for subsequent years. Seeds are produced at the end of the growing season, and are able to survive the winter by having protective coats that shield them from the winter cold. Other plants, called perennials, have either underground tubers, tap roots, or bulbs. During the summer and fall, perennials store food reserves in these places, which they use in the spring to grow roots, branches and leaves.

Trees and shrubs are perennials, although they survive the winter in different ways, depending on if they are deciduous or coniferous. The food-producing green leaves of deciduous trees begin to shut down, and eventually fall off in autumn. Before they fall off, as the green chlorophyll stops being produced, the reds and yellows we see in autumn are revealed. Deciduous trees and shrubs survive as other perennials do – by using the stored energy in their roots and essentially becoming dormant. The above-ground, woody part of the plant is able to survive the cold. One exception to this is the aspen tree, which does not send energy into its roots, but continues to photosynthesize throughout the winter via its bark.

Coniferous, or evergreen trees, on the other hand, do not shed their leaves for winter, and in fact may keep their leaves for several years before they fall off. Their leaves have special adaptations that are resistant to the cold and moisture loss that winter brings. Some conifers, like ponderosa pine, have long, thin needles with a waxy coating, which reduces their exposure to the weather. Others, such as holly, have broad, flat leaves with a waxy coating. The waxy coating, or cutin, prevents water loss from the leaves, which can be a big issue in the winter with little moisture around. Conifers also have small stomata, or pores, on their leaves, which allow them to breathe, yet retain water as well. Conifers can also gather water from the ground via their roots even in the winter. The ground is not necessarily frozen in winter – snow can insulate the ground, keeping it above freezing temperatures. These plants may continue to photosynthesize during the winter if they have enough water, but this occurs much more slowly than during warmer months.

Even the way conifers grow affects their ability to survive in the winter. Their cone shape allows them to more effectively shed snow than if they grew in a more rounded shape as deciduous trees do.

Next time you are hiking in the forest, take a moment to ponder the amazing adaptations of these green (or brown, as the case may be) organisms.