Fall Color

There are several 'theories' on why trees actually drop their leaves each fall, some believe it is a result of natural evolution, a self defense system against insects and wildlife; seems a bit of a stretch to me. The truth of the matter is that available levels of light and water decrease to levels that are below what is required to maintain photosynthesis (plant food production in the leaf). When day length decreases this triggers trees to prepare for winter and thus the reduction of foliage. Some plants lose all leaves while some, like evergreens, drop only a percentage of their foliage year to year.

A green leaf is green because of the pigment Chlorophyll that is present in abundance in leaf cells. The green simply masks out the colors of any other pigments present throughout the prime growing season. Chlorophyll performs a vital function for trees by capturing solar rays using the energy to manufacture plant food, simple sugars from water and carbon dioxide. This manufacturing is the sole source of carbohydrates needed for growth.

Late each Summer and continuing through Fall, veins that carry fluids in and out of the leaf are gradually closed off by the tree with special cork cells. This begins slowly at first and then becomes more rapid as the season progresses. This is when the Chlorophyll levels that have been overly abundant all season begin to decrease and the plants ability to continue to produce this pigment lessens more and more each day. The result is we then begin to see the other pigments that have been present in lower amounts and new ones that the tree produces at this time.

Carotenoids are present all year long but masked, each Fall we begin to see them as the yellows and oranges begin to show. These pigments are present in higher levels in Ash, Maple, Birch and Sycamore trees.

Anthocyamins, the reds and purples are not present throughout the growing season but are produced only near the end of the Summer. As Phosphate levels decrease in the leaf and are moved into storage within the stems then the ability to continue to produce sugars (plant food) changes leading to the production of the Anthocyamin pigment, or the reds and purples. These pigments are present in higher levels in Maple, Oak, Sourwood, Sweetgum, Dogwood and Cherry trees.

The brighter and cooler the days with chilly but not freezing nights the better show of color we can enjoy. This is why fall color shows are always best in northern climates; natural Fall weather in these areas supports the production of these pigments.

Fall is absolutely my favorite time of the growing year and my favorite time to add new trees to my landscape color pallet. When I was in college in New England, one of my very first assignments was to observe the timing of fall colors and the effects of the weather on this show. After 30 years, the assignment continues still. Enjoy the show!

- Don Eaton
Pennsylvania Pride Grow Team