

Autumn in Iowa

<http://www.iowadnr.gov/forestry/fallcolor.html>

Fall Color Legend And Fact

There is much speculation and some folklore associated with the spectacular color changes we generally see in the autumn in our hardwood forests. One “theory” has to do with warm sunny days and cool nights. Another is based on the changes in the length of the days as fall approaches. Some say it is related to soil acidity or a tree’s location on the slope. Others that it is related to frost, or maybe, the existence of wood elves. All these ideas, except the latter, are true to some extent. A common misconception about leaf change is that the leaves are dying. The development of fall colors is an active process and trees must be alive to undergo the change in color and to drop their leaves. Trees which are killed during the growing season do not undergo color change, their leaves simply dry up and do not fall from the tree.

Chlorophyll, the compound most responsible for the manufacture of foods (carbohydrates) by plants, gives them their green color. Chlorophyll breaks down under bright sunlight and is constantly being replaced. As long as plants are actively growing, enough chlorophyll is produced to keep them green.

Other pigments are also present in green plants. They serve as energy absorbers and help chlorophyll do its job. They appear mostly yellow and orange in color but they are not seen much as long as chlorophyll is being manufactured in the leaves.

The amounts of these other pigments in various plants depends on the particular tree species, soil acidity, and the availability of trace minerals in the soils where the trees grow.

The changing of leaf color is associated with winter dormancy in all perennial plants. A chemical called phytochrome triggers plants to go into the dormant period when nights get long enough. Therefore, day length does trigger leaf color change. One of the things that happens when dormancy begins is development of a corky layer of cells between the leaf stalk (petiole) and the woody part of the tree. This “abscission layer” slows the transport of water and carbohydrates. As this happens, the manufacture of chlorophyll is slowed and the green color in the leaves begins to fade, allowing the other pigments to show through. Since the transport of water is slowed down, food manufactured by the remaining chlorophyll builds up in the sap of the leaf and other pigments are formed which cause the leaves to turn red or purple in color, depending on the acidity of the sap.

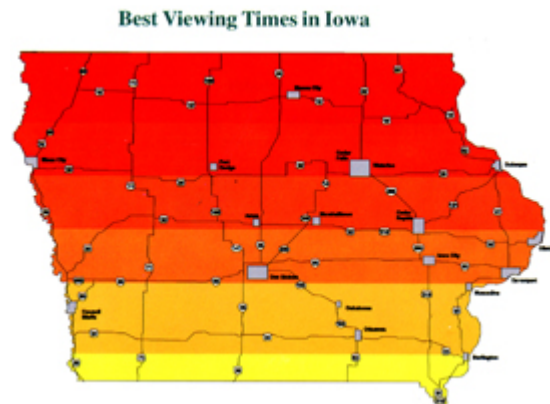
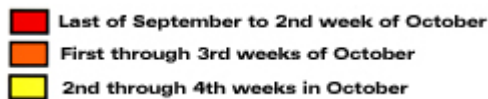
For example, sumac almost always turns red because red pigments are present and its leaf sap is acidic, while many of the oaks and sometimes ashes will get a purplish color because the sap is less acidic. Trees like birch and aspen don’t have much orange pigment, so they appear mostly yellow in the fall. Others don’t have much yellow pigment, and turn mostly orange or red. Some trees have a balance of pigments and look pinkish. The brown color of many oaks and hickories can be attributed to a buildup of tannin which is a waste product in the leaves. There are endless variations of pigmentation in trees which changes as the fall season progresses.

Effects of Fall Weather

Weather throughout the fall season has much to do with the development of fall color in trees. Cool night temperatures destroy chlorophyll quickly, but below freezing temperatures inhibit production of red pigments. The brightest displays of color occur when we have an early fall of bright sunny days and cool nights. These are excellent conditions for the development of red pigments. Cloudy days and warm nights will produce less brilliant colors because chlorophyll breaks down slowly and the red pigments are not formed quickly enough. Dry weather causes a greater buildup of sugars in the leaves, enhancing the production of the red pigments. Windy, rainy weather causes many leaves to fall prematurely, lessening the intensity of the display. A killing frost will destroy the leaf cells and the coloration process will not function effectively.

When do the Colors Peak?

Peak fall color occurs in Northeast Iowa, on the average, on the weekend closest to October 10th. Peak fall color occurs later in the more southern parts of the state, however, as explained above, it all depends. Perhaps the most important thing about fall color is having the time to enjoy it.



Leaf color characteristics of some common plants:

Walnut: Turns yellow in fall. One of the first to turn and drop leaves. One of the last to leaf out in spring.

Red Oak: Brilliant red leaves in fall. Color probably not as intense as some hard maples.

White oak: Subdued red color of leaves in fall. Then turning brown and often staying on the tree until new leaves begin to grow in the spring.

Bur oak. Buff to yellow. Turning brown before falling.

Hickory. Leaves turn yellow, then brown before falling.

Ash. Leaves turn yellow, but some have a purplish cast. Leaves fall after walnut but earlier than oaks and maples.

Elms. Leaves turn yellow, some turn brown before falling, others while still yellow.

Soft maple. Leaves turn yellow. They don't turn brown before falling.

Hard Maple. Brilliant red hues. Red pigmentation of some leaves breaks down before falling.

Sumac. Redder and anything, but often overlooked because it is a small tree confined to openings and edges.

Virginia Creeper. Bright red. Very spectacular when it grows on dead snags.