

How Does the Weather Affect the Color of Fall Leaves?



Article as seen on Accuweather.com
Photo courtesy of Yvonne Lashmett

As the weather turns cooler, the trees will once again put on their show of brightly colored leaves. Many weather factors play into how intense the colors will be and how long the vivid leaves will be around.

After the leaves are fully developed on trees, they begin making and storing the carbohydrates that will be needed for the new tree growth in the following year. As the season progresses, in late summer or early fall, the trees enter a growth process that produces the colorful fall leaves, according to Usna.usda.gov.

As the tree grows throughout the spring and summer months, chlorophyll is constantly replaced in the leaves. The chlorophyll gives the leaves their green color. As the nights get longer in the early fall, the cells near the juncture of the leaf and stem divide rapidly but do not expand. This action of the cells form a layer called the abscission layer. The abscission layer then blocks the the transportation of materials from the leaf to the branch and from the roots to the leaves. As the chlorophyll is blocked from the leaves, it disappears completely from them. The lack of chlorophyll allows the yellow (xanthophylls) and orange (carotenoids) pigments to be visible. The red and purple pigments (anthocyanins) are manufactured from the sugars that are trapped in the leaf. These pigments in leaves are responsible for the vivid color changes in the fall.

Temperature, sunlight and soil moisture all play a role in how the leaves will look in the fall.

- **Abundant sunlight and low temperatures** after the abscission layer forms cause the chlorophyll to be destroyed more rapidly.
- **Cool air** (especially at night) with a lot of daytime sunshine promote the formation of more red and purple pigments.
- **Freezing conditions** destroy the leaf's ability to manufacture the red and purple pigments. Early frost will end the colorful foliage.
- **Drought** during the growing season can cause the abscission layer to form early and cause the leaves to drop before they change color.
- **The best weather** for brilliant fall foliage is a growing season with ample moisture followed by a dry, cool and sunny autumn with warm days and cool but frostless nights.
- **Heavy wind or rain** can cause the leaves to fall before they fully develop color.