Fall Colors of Trees—in Kansas

By Kansas State University

Part of the allure of fall foliage is the variation in color. We have trees that turn red, purple, yellow, orange and brown. Specific colors are caused by specific plant pigments. The normal green color of foliage is from chlorophyll, the substance that captures the energy of the sun. Fall colors are caused by other pigments. Reds and purples are caused by anthocyanins, yellows are due to the presence of xanthophylls, and oranges are caused by a combination of carotenes and xanthophylls. Browns are the result of tannins present in the leaf. Most of these substances are present throughout the growing season but are masked by the green color produced by chlorophyll. Anthocyanins are the exception and are produced after the chlorophyll is destroyed in the fall.

If you have ever seen pictures of New England in the fall, you have probably wondered why trees in Kansas usually do not color as well. This difference is partly due to the species of trees prevalent in New England. Certain oaks and maples naturally produce good color. Coloring is also due in large part to the weather.

Warm, sunny days and cool nights are ideal for good color. The sunny days encourage photosynthesis and, thus, sugar accumulation in the leaves. As fall progresses, each leaf develops an abscission layer at the base of the petiole, or leaf stem, that prevents these sugars from being transported down the trunk to the roots for storage. This high sugar content in the leaves produces more intense colors. Cloudy days and warm nights prevent some of the sugar accumulation in the leaves and results in less vibrant colors.

Weather during other parts of the growing season can also have an effect. Heavy rains in the early spring or hot, dry weather during the summer can both have a deleterious effect on fall color.

The length of time a tree maintains fall color also depends on weather. Reds, yellows and oranges are short-lived when trees undergo frosts and freezes.

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