Changing Leaf Colors Signal Beginning And End Of Seasons

Every year at this time, Mother Nature produces the brilliant fall color display on many of our native and planted species of trees and shrubs. As summer turns into fall, leaves turn red, orange and yellow before finally fluttering to the ground.

Some people credit Jack Frost with this annual painting of the landscape, but frost does not fully explain why leaves change color since some leaves change before the first frost.

Native Americans believed leaves changed because celestial hunters had slain the Great Bear — his blood dripping on the forest and changing many trees to red. They believed other trees turned yellow because of fat spattering out of the kettle as the hunters cooked their meat.

However, fall coloration is the result of chemical processes, which take place in the tree during preparation for winter. Weather and the pigments contained in the cells of the leaf are factors that influence fall color.

There are four types of pigments: chlorophyll A and B, carotene and xanthophyll. The chlorophyll are either green or blue-green. Carotene and xanthophyll are yellow. During the summer, the chlorophyll, which use photosynthesis to make food for the tree, dominate the other pigments and the leaves appear green. Chlorophyll is constantly being broken down during the summer, but it is just as constantly being replaced in the summer.

In the fall, when days begin to shorten, production for new chlorophyll diminishes, but the breakdown of old chlorophyll continues. Soon, all the chlorophyll is gone, and the leaf is essentially dead. Leftover food in the leaf is sent to the body of the tree for storage. All that remains in the cell cavities of the leaf is a watery substance containing a few oil globules, waste products and possibly yellow pigments. If yellow pigments are characteristics of the species, they are present all summer long, but only become visible when the overpowering chlorophyll dissipates. They produce the yellow coloring so familiar in autumn foliage.

Reds and purples are produced when more food is manufactured in the leaf than can readily be transported back to the tree for storage. When this occurs, excess food in the form of sugars may chemically react with other substances in the leaf to produce other pigments called anthocyanins. Anthocyanins account for the reds and purples, though some trees develop more anthocyanin than others.

Weather affects leaf color in many ways. Cool nights slow down chlorophyll synthesis and accelerate the breakdown of the green pigments. This allows the yellow colors of the carotene and xanthophyll to stand out. Bright, sunny days increase the rate of photosynthesis and result in excess sugars needed to produce anthocyanins or red pigments. Warm, rainy autumns generally produce dull colors. Below freezing temperatures may kill leaf tissues and prevent any colors from forming.

Red coloring in autumn foliages is produced when more food is manufactured in the leaf than can be transported back to the tree.

Each tree or shrub develops its own fall coloration depending on the proportions of yellow and red pigments present. Differences also occur within a single species. Soil also can influence fall coloration. Soils high in nitrogen seldom produce brilliant fall colors because surplus sugars combine with nitrogen to form proteins and vegetative growth.

Yellow fall leaves are most common. Trees that exhibit good yellow fall coloration include cottonwood, ash, basswood, honeylocust, elm, hickory and silver maple. Red fall color is common in red maple, pin and red oak, amur maple, dogwood and smooth sumac. Purple coloration is less common. White ash, gray dogwood and some viburnums develop a purplish cast.

Some trees, such as sugar maple, contain all pigments and create spectacular mixtures of orange, red and yellow. Other trees contain no red or yellow pigments and merely turn brown as the chlorophyll disappears from the leaves.

SOURCE: Dennis Adams, forester, NU/IANR (DJ)

Survive Rural Road Hazards

Farm equipment often clogs up the normal flow of traffic on rural roads.

Roads crowded with large equipment pose a hazard to drivers, many of whom don't expect the delays.

To cope, farmers and drivers alike must take safety precautions and use common sense when evaluating potentially dangerous driving situations.

When farmers need to move large and often cumbersome equipment, they should do so during full daylight hours when visibility is good. Supplemental lighting and reflective tape help drivers recognize the outline and size of machinery. If farmers must move their equipment when it's dark, they should use marker and road lights instead of field lights.

Unless absolutely certain, drivers can get around them, farmers shouldn't signal for them to pass. In addition, farmers should never encourage a driver to do something illegal, such as pass on a hill or in a no-passing zone.

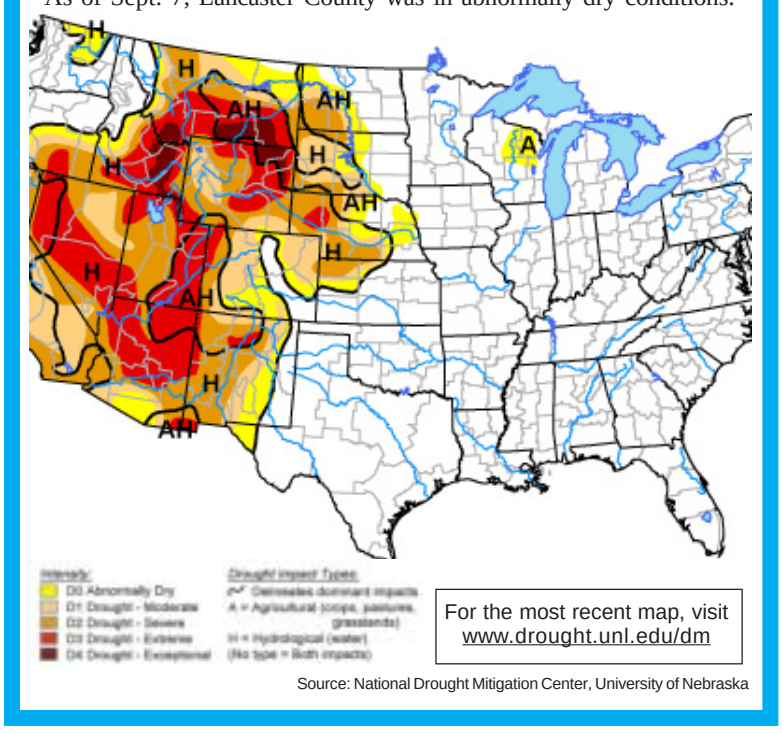
For people driving regular vehicles, slowing down is crucial. Slower speeds allow drivers to recognize what's ahead and estimate the speed and size of farm equipment. Drivers often underestimate how fast they're approaching farm equipment when they're overtaking it from behind.

Drivers should work with farmers when they try to move to the side of the road to allow them to pass. If the shoulder of the road is soft or has been washed out, farmers can't always get over far enough to the side. Patience and caution create a safe driving environment.

SOURCE: David Morgan, safety engineer (DJ)

Latest U.S. Drought Monitor Map

As of Sept. 7, Lancaster County was in abnormally dry conditions.



For the most recent map, visit www.drought.unl.edu/dm

Source: National Drought Mitigation Center, University of Nebraska

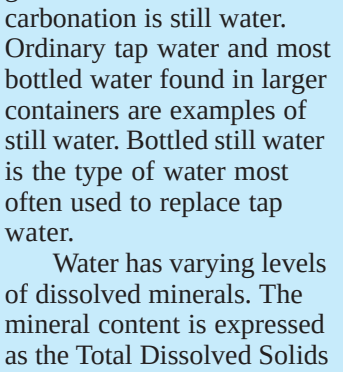
Can You Guess It?

Did you guess it? Find out at
lancaster.unl.edu

Did you guess it from the August NEBLINE?
The answer was a watermelon cut in the shape of a pig.

WATERWHEEL

What is Bottled Water?



Note: This is part of a series of articles related to rural water issues.

Bottled water is defined as water that is sealed in food grade bottles and intended for human consumption. There are several types of bottled water, depending on the type of water provided and the source of the water. This publication will address the type of bottled water most often used to replace tap water. Some bottled water is carbonated and is called sparkling water. This water has a "fizz" that is usually created by carbon dioxide gas. Water without the added carbonation is still water. Ordinary tap water and most bottled water found in larger containers are examples of still water. Bottled still water is the type of water most often used to replace tap water.

Water has varying levels of dissolved minerals. The mineral content is expressed as the Total Dissolved Solids (TDS) in the water. Bottled water sold as mineral water usually has a higher TDS content than tap water since people want and expect mineral salts in their mineral water. Distilled or demineralized water has been treated to remove nearly all minerals that occur naturally in the water, making the water taste flat. Natural water is unmodified by mineral addition or deletion. Groundwater will contain the minerals dissolved as the water moves through soil and rock materials. Natural bottled water or mineral water are the types most often used to replace tap water.

Bottled water can come from a variety of sources including groundwater from a well, water from a protected spring, or water from a public water supply. Groundwater comes from an aquifer, an underground zone of saturated sand, gravel or rock that yields significant quantities of water. In most cases a well is drilled in the ground and cased, and the water is pumped out. Spring water flows naturally to the surface from an underground formation. The source of water for a public water supply can be groundwater, surface water or a combination. Bottled water from all of the sources mentioned above is used to replace tap water. (DJ)