

## Nature's Van Gogh

by Edwin Wollenberg, Retired Supt.

It seems like only yesterday that Mother Nature gave birth to our trees again. And all summer long we watched with concern and hope that the new plantings would survive and mature into stately and admired trees, and eventually take their place among those we have enjoyed for so many years.

But now the time has come where the painters are assembling their brushes and are picking their color schemes, and very shortly will present us with a panorama of fall colors that will leave us all breathless with beauty.

I am sure we have all wondered what causes the phenomena of the fall colors of our trees. From what I've read, it is the chemical changes in trees, brought about by changes in day length and temperature, which triggers changes in leaf color. During spring and summer the green pigment, chlorophyll, dominates other pigments and is the one you see mostly in a healthy growing tree. The chlorophyll is needed in the process by which the leaf uses sunlight and carbon dioxide to manufacture carbohydrates — sugars and starches. But as the days become shorter in the fall and the temperature begins to drop, the leaves stop making food and the chlorophyll breaks down. As the green color fades away, yellow pigments that have always been present in the leaf become noticeable for the first time.

Meanwhile, other chemical changes may occur that cause the formulation of other pigments. These vary from yellow to red to blue and accounts for some of the red, orange, yellow and purple in fall foliage.

Colors are more brilliant some years than others, and this depends on the weather. Such trees as red maples, silver maples, sweetgum, red oak and sassafras will be redder when fall days are warm and sunny and nights are cool — below 45 degrees. Under these conditions, sugar that forms in the leaves during the day remains in the leaves at night. A red pigment is formed from this sugar. The more sugar that is trapped in the leaves, the more red pigment there is. During a warm, rainy fall, what little sugar the leaves make on cloudy days moves out of the leaves during warm nights. No excess of sugar remains in the leaves to make the red pigment.


Leaf color also varies not only from year to year, but from tree to tree and from one side of a tree to the other. Leaves exposed to direct sun may turn red, and leaves in the shade turn yellow. Healthy trees may be more brightly colored than trees under stress, although sometimes sick or injured trees will develop color earlier.

Leaves drop from the trees because a special layer of cells, which develops at the base of the leafstalk, severs the leaf from the twig. And the same time, the spot on the twig where the leafstalk was attached is healing. When the leaf drops off, only a leaf scar remains on the twig and lots of clean-up work for you and me.

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