

## FIERY FOLIAGE OF AUTUMN

It is Fall and a kaleidoscope of autumn color has already begun to spread across the Midwest.

While usually attributed to the artistic ability of Jack Frost, Autumn color is controlled by a combination of chemical, genetic, and environmental conditions. Leaves are green because of the chlorophyll in them. It is chlorophyll which captures the rays of the sun, transforming carbon dioxide from air and water from soil into food for the plant. New chlorophyll is continuously produced in the leaf while, at the same time, it continuously breaks down. As long as the rate of breakdown nearly equals the rate of production, the leaves stay green. Genetics control the production of chlorophyll along with the production of carotene (yellow coloring pigments) and anthocyanin (red coloring pigments). During the growing season, carotene and anthocyanin are masked by the green of the chlorophyll.

As days shorten in late summer or early autumn, the plant gradually stops producing chlorophyll and that already produced is eventually depleted. As the chlorophyll disappears, the yellow pigments, carotene and xanthophyll, which had previously been masked, become apparent. Suddenly appear the golden yellows of birch, ginkgo and many other plants, the brilliant rich ruby-reds and fiery scarlets that set aflame the autumn forest. Sassafras and many of the maples are outstanding for their brilliant red coloration.

Anthocyanin, the pigment responsible for the red colors results from an accumulation of sugars and tannins in the leaf. Anthocyanin is made of sugars. Weather conditions that favor accumulation of sugars in the leaf also increase the amount of anthocyanin in the leaf. This in turn increases the intensity of autumn color.

Bright, sunny fall days provide an ample supply of (sugars) through the process of photosynthesis. Such days must be then followed by cool nights (40-45° F). Cool nights trap the sugars in leaves. The accumulation results in the manufacture of the anthocyanin red pigment. It is these conditions which create nature's masterpiece of hues and tones.

Autumns made up of cloudy days and warm nights result in less sugar being produced, most of which is translocated out of the leaves to the roots and trunk. This produces less intense fall color. Prolonged drought, such as we have experienced this summer, causes autumn color to appear earlier. It is also interesting to note that the western side of a tree usually displays the deepest and most vibrant of fall colors. This seems logical knowing that it is the western side of the tree which gets the most sunshine.

These conditions explain why the brilliance of fall colors varies from year to year and from one location to another.

It is this complex phenomenon of sunshine, temperature and sugar which sets aflame the forested countryside in autumn. Plan to take time this fall to get out and enjoy one of nature's masterpieces. It should be most spectacular this year.

**James A. Fizzell, Extension Advisor  
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At the intersection, when the light had turned green, the woman driver was still unable to get her car started. The man in the car behind was impatient, so he honked his horn, and then again and again. Finally the woman went back to him and said, "If you will go up there and start my car, I will stay here and honk your horn."



### **JAMES R. BROOKS JOINS HARVEST PUBLISHING AS NATIONAL SALES MANAGER FOR GOLF BUSINESS MAGAZINE**

The Harvest Publishing Company is pleased to announce that James R. Brooks has joined the company as national sales manager for GOLF BUSINESS, the magazine for golf course management and turf maintenance. According to Richard J. W. Foster, Group Publisher of Harvest's Business Publications Division, Brooks will have over-all responsibility for the sales and promotion activities associated with GOLF BUSINESS. In addition, he will be personally responsible for the southern sales region. Brooks will be based in the Business Publications Division's new Atlanta sales office.

Brooks, 39, is well-known among golf course superintendents, turfgrass educators, and the turf maintenance industry. For the past five years he has been associated with the Golf Course Superintendents Association of America, serving most recently as director of marketing and sales.

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