



Extension Gardener

NC STATE UNIVERSITY

NORTH CAROLINA COOPERATIVE EXTENSION

Fall 2009

Empowering gardeners. Providing garden solutions.

Why Do Leaves Change Colors?

Society is profoundly affected by autumn. Every year as the days get shorter, nights grow longer and the temperature outdoors becomes cooler, the leaves in our abundant deciduous forests across the state and country begin to turn bright hues of gold and crimson. Millions of tourists come to visit our national and state forests every year to experience fall's brilliance. Perhaps the warm coolers are nature's way of warming our spirits in preparation for the cold temperatures that follow.

The changing of color in leaves is largely connected to the change in day length. As days grow shorter, photosynthesis and chlorophyll production in the leaves slow down until they eventually come to a stop. Chlorophyll is what gives leaves their green color. When chlorophyll is absent, the other pigments present inside the leaf begin to appear. These pigments are known as carotenoids. They produce colors of yellow, orange and brown.

In addition to being influenced by the change in day length, a plant's fall color is affected by the weather and the intensity of light. Anthocyanins are red and purple pigments that are produced when excessive amounts of sugar in the leaves combine with bright light. Scientists hypothesize that the anthocyanin pigments in

leaves help to protect the photosynthetic system as plants prepare to go dormant and nutrients are being transferred to other areas of the plant. The anthocyanin pigments produced in some leaves depend largely on the pH level of the cell sap (sugar) in the leaf. Leaves with highly acidic cell sap produce very red hues, while leaves with lower pH levels produce purple hues.

The changing fall weather causes a corky membrane to develop between the branch and the leaf stem. This membrane reduces the flow of nutrients into the leaf and begins the leaf-changing process, which is completed when a layer of cells at the base of each leaf is clogged, sealing the foliage from the environment and finally causing the leaf to fall.

Nature creates this magical canvas every fall, which is an inspiration to gardeners and outdoor enthusiasts. Consider incorporating a few tree specimens into your landscape that have stunning fall foliage. The United States National Arboretum has a wonderful list of plants with fall foliage colors that range from yellow to brilliant red. Visit www.usna.usda.gov/PhotoGallery/FallFoliage/FallColorList.html. To find more information on planting trees and shrubs in North Carolina, visit www.ces.ncsu.edu/depts/hort/hil/hil-601.html.

—Michelle Wallace

in this issue

MOUNTAIN NEWS

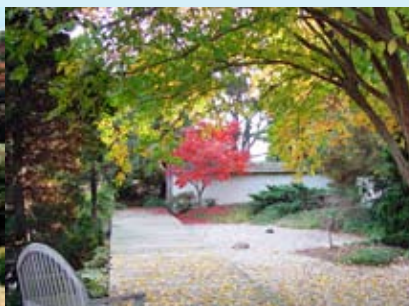
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STATE NEWS

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- Hemlock Woolly Adelgids



C. Schneider, USDA—NRCS



JC Raulston Arboretum



C. Schneider, USDA—NRCS



JC Raulston Arboretum

Upcoming Events

September 12

Fall Plant Sale & Open House

(10 AM – 2 PM)

Bullington Center, Hendersonville

- Fall vegetables, spring-flowering bulbs, perennials and shrubs. Take a tour of the gardens, and enjoy some refreshments. Bring friends and introduce them to the Bullington Center!

September 12 - 13

Annual Dahlia Show, Carolinas

Dahlia Society

The North Carolina Arboretum, Asheville

- Exhibitors from five states, including commercial and amateur growers from our local mountains, upstate South Carolina, metro Atlanta, southeast Tennessee, southwest Virginia, and the N.C. piedmont, will participate.

October 10 - 11

Carolina Bonsai Expo

The North Carolina Arboretum, Asheville

- The city of Asheville transforms into the bonsai capital of the Southeast the second weekend of every October when The N.C. Arboretum hosts the Carolina Bonsai Expo. Visitors to the show will find an abundance of miniature trees and landscapes, creatively displayed at the Arboretum's Education Center.

Oct. 14,

Growing Orchids (3:30 - 5:00 PM)

Bullington Center, Hendersonville

- Cynthia Giloolly, the well-known "Orchid Goddess" at B.B. Barnes Nursery, takes her show on the road to Bullington in a program about the basics of growing and caring for orchids. \$15

Sustainable Gardening — Reduce waste through composting

Almost 13 percent of the solid waste generated in the U.S. comes from yard and garden waste, which represents 32 million tons a year that we send to landfills. With composting in mind as a way to reduce waste, let's look at what can and can't be added to your compost bin.

Almost anything that grows outside can be added directly to your compost bin. Compostable items include grass clippings, hay, straw, leaves, wood chips and other yard trimmings. There are some limitations. Weed seeds can survive decomposition. Remove seed heads before placing weeds in your compost. Diseased plant material can harbor pathogens that survive composting and re-infect plants when the compost is used in the garden. Fireplace ashes can raise the soil pH for acid-loving plants. Some wood ashes are fine. I prefer to play it safe by not using ashes in my compost bin.

Do not add meat, grease or dairy products, or dog and cat feces. Meat bones or scraps, fats (grease, lard, and oils) and dairy products create odors and attract pests, such as rodents

and flies. Pet wastes might contain parasites, bacteria, germs and viruses that are harmful to humans.

You've probably been told that it takes the right ratio of carbon (browns) and nitrogen (greens) to produce compost quickly. This is true. Composting, however, happens in nature without help from us. It takes longer for materials to compost without the proper ratio, air and moisture, but the materials will compost eventually. If you don't have time to provide the exact ratio of brown and green materials, simply keep some of both working all the time. Particle size is a key factor. Whatever is added should be smaller than 2 inches in diameter. The decomposition rate can be accelerated by keeping the compost pile moist and by turning it often to provide oxygen.

By following these simple steps, you can help decrease the need for landfill space and enjoy a free soil amendment.

—Tim Mathews

Food Production — Our love affair with tomatoes

The tomato has long been the most popular vegetable grown in American gardens. Our love affair with the tomato is alive and well on many different levels. A myriad of different flavors are available, and hundreds of different varieties are grown each year. Shape, color, size and harvest date offer something for everyone. Whether you are a tomato sandwich purist or a salsa maker, the appropriate tomato is out there, just waiting to be planted in your own backyard.

Anyone who tries to grow the perfect tomato can encounter all sorts of roadblocks, everything from weather issues to good intentions that turn into one's own worst enemies. Let's look at what it takes to grow this premier fruit (or vegetable).

First, a well-drained, sunny location is essential for healthy, long-lived vines. At least 6 hours of full sun each day is necessary to

produce a good crop of tomatoes. Choose healthy plants that have not yet started to bloom or form small fruits. Consider delaying your initial planting until after the danger of frost is over. Stagger plantings so that you will have some vigorous plants in late summer, and choose your plants based on the amount of available space. Determinate plants grow to a certain height and quit, whereas indeterminate plants can reach the roof of the house and keep going.

Be aware of disease and insect problems, and be ready to combat them. One of the best ways to prevent diseases is to plant resistant varieties. Frequent inspection of plants is also helpful. The earlier problems are noticed, the easier the solution. The 2009 season has been challenging for the tomato, but it still reigns as the "king of the garden."

—Donna Teasley

Garden Spot — *The EnergyXchange*

After the landfill that served Yancey and Mitchell counties closed in 1994, a non-profit organization called the EnergyXchange was set up to use the landfill gas. Energy Exchange developed greenhouses to cultivate endangered flora and a craft studio “incubator” program that supports entrepreneurs in starting, managing and operating new businesses in the crafts of glass blowing and pottery.

The horticultural program at the EnergyXchange is known as Project Branch Out. Its mission is to propagate the rare and native flora of western North Carolina and provide educational opportunities for local students, growers and plant enthusiasts. Helping farmers create cash crops as alternatives to raising tobacco or Christmas trees was the driving force behind Project Branch Out. One major push for the project came from restrictions being placed on harvesting these plant species from the wild by the U.S. Forest Service

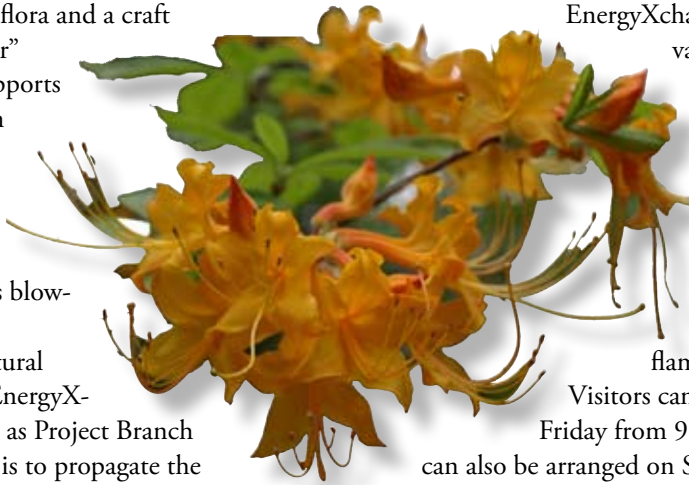
due to declining populations. Now growers are propagating these plants from wild-harvested seed and tissue culture. Growers can obtain the native plant species they want, and native populations are protected for generations to come.

EnergyXchange grows several varieties of evergreen rhododendrons and deciduous azaleas. The best-selling and best-known native plant grown at EnergyXchange is the flame azalea.

Visitors can drop in Monday – Friday from 9 AM – 4 PM. Tours can also be arranged on Saturdays throughout fall and winter by calling 828.675.5541. Find more information online: www.energyexchange.org

—Jeremy Delisle

Project Branch Out at the EnergyXchange propagates native flora, including mountain laurel and flame azalea (pictured above). (Photo courtesy JC Raulston Arboretum)



Environmental Stewardship — *Fertilizer overuse*

Applying too much fertilizer not only affects our environment; it also damages the plants we are trying to maintain. Heavy fertilizer applications can lead to nitrogen leaching into groundwater and phosphorus washing into surface water. Excess fertilizer washed into lakes and ponds can result in algae blooms that deplete oxygen in the water and cause fish kills. Fertilizer runoff is not easy for people to see, but over-fertilization can be readily seen in plants.

One common overuse is lawn fertilizers. Homeowners may think if a little fertilizer is good, then more is better. On the contrary, over-fertilized lawns are prone to diseases, such as brown patch, pithium and helminthosporium. Over-fertilizing fruit trees can have negative effects. Trees putting on excessive growth from too much fertilizer will develop a dense canopy. Too much shading leads to dead limbs and fruit that will not ripen properly. Diseases are also problems on trees with dense canopies because of limited

sunlight penetration and air movement. Fruit trees should be pruned every year, and trees with excessive growth require more time to prune.

Research conducted on fertilizer rates and insect pests has shown a correlation in some instances. Scientists have found that tomato plants with the highest fertilizer rates were significantly more attractive to thrips, which carry tomato spotted-wilt virus. Other studies have shown that whiteflies reproduce more rapidly on plants with high nitrogen levels than on other plants, making biological control difficult.

Over-fertilization makes an impact on our plants and the environment. Soil and foliar sampling are good ways to determine what plants need and, more important, what they do not need. “If a little works, then more is better” is a concept we need to discard for pesticides and fertilizers.

—Bill Hanlin, Ph.D.

Tips & Tasks

Avoid Common Landscape Mistakes

Lawn Care

- Seed tall fescue and Kentucky bluegrass lawns in early September. Mulch seeded areas with wheat straw to protect seedlings from drying out.
- Fertilize and lime tall fescue and bluegrass lawns according to soil test results. This is the second feeding for the year.
- Do not fertilize warm-season grasses in the fall.
- Homeowners can apply an insecticide for grubs in the lawn in early September if not done in August.

Ornamentals

- Do NOT prune shrubs in September – early November!
- Check azalea and pyracantha for lacebugs; euonymus for scale; juniper, arborvitae and hemlock for spider mites.
- Control weedy blackberries, trumpet creepers, and wiregrass with glyphosate herbicide.
- Shop for spring-flowering bulbs to plant in November. Consider trying something new, such as leucojum or galanthus.

Edibles

- Monitor fall vegetables for insects. Fall gardens are productive; they also have insect pests.
- Begin cleaning up vegetable plots so debris can decompose before next spring. Till plant debris into the soil.
- Clean up garden sprayers and lawn equipment if not in use.
- As the vegetable garden finishes, add composted manure or mushroom compost to improve the soil.

—John Vining



JC Paulston Arboretum

Showstopper — 'Rose Creek' abelia

Clusters of tubular-shaped, dainty white flowers cover this dwarf form of abelia. 'Rose Creek' (*Abelia xgrandiflora*) was selected by the University of Georgia for its low mounding growth habit, crimson stem color, mildly fragrant white flowers and exceptionally long blooming period – from May until frost. Since its release in 2001, this shrub has excited gardeners and commercial growers with its landscape potential. Growing 3 feet high and 3 to 4 feet wide, this abelia can be used as a low hedge, foundation plant and in outdoor containers. Truly a four-season plant, this evergreen shrub's leaves emerge in spring with a pinkish cast and turn a lustrous dark-green in summer. A pink calyx remains after the white flowers fade, and the leaves transition to a verdant purple in winter.

Wonderfully compact, 'Rose Creek' abelia will grow in full sun to partial shade. Once established it is very drought tolerant.

—John Vining

Incredible Edibles — Grapes

Do you have muscadines growing in your yard? If you live in the lower piedmont or coastal plain, you should! The fruit has a distinct aroma, and is popular for making wine, pies and jellies. The juice is sweet with a light taste. Throughout the lower piedmont, try 'Magnolia,' 'Carlos' or 'Sterling' varieties. In the coastal plain, try 'Cowart,' 'Noble' and 'Triumph.' Muscadines can adapt to a range of soil types, but prefer a soil pH of 5.5 to 6.5 and well-drained sandy loam. The grapes are tasty, and studies show they are high in healthy antioxidants. Although muscadines do not grow well in the N.C. western mountains, gardeners there can consider 'Niagara' or 'Concord' grapes.

Visit www.ces.ncsu.edu/depts/hort/hil/hil-8203.html.

—Della King

Pest Alert — Hemlock woolly adelgids

Although the native range for hemlocks includes the N.C. mountains and foothills, the eastern hemlock is frequently planted in landscapes throughout the state. A tiny introduced insect, the hemlock woolly adelgid, has spread from New England through the southern Appalachian Mountains and has occasionally been reported in other parts of North Carolina.

The hemlock woolly adelgid resembles an aphid and sucks sap from the needles. A heavy infestation drains so much energy from the tree that even a large tree can be killed in a few years. An infestation is easy to identify by the white cottony masses along the twigs, at the base of the needles.

Homeowners can treat infested trees. Small trees can be sprayed with insecticidal soap or horticultural oil. The best time to spray is Sep-

tember through November. Fair control can also be obtained by spraying in February or March. Trees probably will need to be sprayed every year. Large trees can be treated with a systemic soil drench using either imidacloprid (Merit or Bayer Advanced Tree and Shrub Insect Control) or dinotefuran (Safari). Measure the circumference and diameter of the tree trunk. Using the measurements, carefully follow label directions to calculate how much product to mix per gallon of water. Scrape a shallow trench around the tree's base, and pour in the mixture. Treated trees should not need to be re-treated for 2 to 4 years. See this insect note: www.ces.ncsu.edu/depts/ent/notes/O&T/trees/note119/note119.html

—Linda Blue

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White cottony masses indicate a hemlock woolly adelgid infestation. (Photo courtesy USDA—NRCS)

Sustainability

Barnyard Chickens

Backyard chickens can be rewarding and sustainable. They dispose of vegetable scraps, reduce insect populations, lay fresh eggs and produce rich compost. In return, chickens require safe shelter, food and access to fresh water. Rid your garden of pesky insects by locating your chicken tractor over a vegetable bed prior to planting. Letting the chickens feed can reduce the population of borers and other soil insects. Feed all vegetable kitchen scraps to chickens to enhance their diet. Put chicken waste in the compost pile to make it heat up and the materials break down. After collecting fresh eggs in a variety of colors, with deep golden yolks and fresh taste, you won't want to go back to grocery store eggs. So consider adding chickens to your garden.

—Cyndi Lauderdale