



The Color Guard

As New England's foliage season begins, we are commonly asked why trees change color. Historically, it was believed that autumn colors were simply a byproduct of dying leaves. However, recent research suggests that fall colors may have an expanded role in the life of trees.

During spring and summer, leaves get their green cast from chlorophyll, the green colored pigment that captures the energy in sunlight for photosynthesis. Leaves also contain other pigments, but whose colors are masked by the super-abundant chlorophyll. During autumn, chlorophyll begins to break down. Formerly, it was widely held that autumn colors were simply the expression of the remaining pigments, now unmasked by the absence of chlorophyll. In other words, fall colors were a tree's gray hair.

Recently, this belief has come into question. Interestingly, research suggests brilliant autumn colors may actually contain a visual message warning insects.

For example, in the fall certain insects choose trees on which to lay their eggs. In the spring, the eggs hatch and the juvenile insects feast on their host tree. It has been theorized that the production of brilliant autumn colors essentially announces the tree's lethality to insects. Over time insects have evolved to avoid these bright leaves and through natural selection, trees evolved to produce even brighter foliage.

This 'leaf-signal' hypothesis proved so provocative among researchers that multiple worldwide studies were conducted to test its legitimacy. Preliminary results found that trees with strong fall colors indeed tend to suffer less insect damage. However compelling, there are a number of details about insects and trees

that conflict the leaf-signaling hypothesis. Namely, when bright autumn colors appear, insects that feed on foliage may not be present to warn off.

Other research argues an alternative explanation suggesting that changing colors serve as a sort of leaf sunscreen. The interior of an autumn leaf is a frenzy of activity. Much of the chlorophyll and other molecules necessary for photosynthesis are carefully dismantled. Therefore, the leaves are inherently less efficient. Autumn leaves cannot capture all the sunlight striking them and any remaining energy can build up in the leaf, causing damage. Red and orange colors, produced by pigments called anthocyanins, appear to protect the leaves by blocking excess sunlight.

Interestingly, recent evidence in favor of the 'leaf-signal' hypothesis actually supports the 'sunscreen' hypothesis. The link found between bright fall colors and a lack of damage in the spring may be a result of the trees doing a better job of protecting their leaves in preparation for winter dormancy. Further research has helped explain why some trees have bright colors and others do not. Some trees, like birch for instance, produce no anthocyanins. Their yellow leaves are produced by a class of pigments called carotenoids which help chlorophyll absorb sunlight, but do not shield the leaves in the fall.

This new debate and research has continued to raise questions rather than provide definitive answers. The discussion is an example of the complexity of tree physiology and lends deeper reverence for the beauty displayed in fall's foliage. ■



Photo: Seymour Levy

Building Blocks

Sometimes it's not easy to be a tree. Trees in landscapes often live under stressful conditions due to low moisture availability, compacted soil, physical damage, construction activity, and competition from other plants. A prescription based fertilization program can be a key component of a complete and effective plant health care program.

Fertilization is an important tree care practice providing plants with the basic building blocks to maximize their genetic potential. The purpose of supplemental fertilization is to provide soil minerals needed by plants, that may not be readily available or are simply limited in landscape soils.

Nutrient deficiencies occur for a number of reasons in the landscape environment. Deficiencies may be diagnosed through visual symptoms, such as leaf color, twig growth, or soil and foliar nutrient analysis. When deficiencies occur, trees will be more susceptible to insect and disease problems and will not reach their full potential.

It is important to understand fertilization. Fertilizer is not food, but is a method providing the essential elements plants need. Fertilization is often necessary in landscapes because natural decomposition and resulting nutrient cycling does not take place. Often, landscapes have leaves carefully and methodically removed each fall. Under forest conditions, these fallen leaves and other organic matter would remain onsite creating a protective blanket which ultimately releases nutrients back into the soil.

Trees, like all other living things, have specific nutritional requirements for sustained growth and reproduction. When nutrients are unavailable, fertilizers help correct those deficiencies.

Trees require large quantities of six macro-nutrients and lesser quantities of ten equally vital micronutrients. One of the most important macro-nutrients is nitrogen, which coincidentally is often the most

limiting nutrient in soils. Micro-nutrients are needed in smaller amount and can generally be found in sufficient amounts in properly pH balanced soils.

Many environmental factors affect the need for various nutrients. Higher concentrations of plants increase competition for resources like water, space, and nutrients. Plant species also influence the need for fertilizer. For instance, grasses use large amounts of nitrogen, reducing the amount available for trees. Young, vigorous trees may use more nutrients than older, slower-growing trees. Large trees require greater resources to support their mass.

Nutrient deficiencies increase susceptibility to environmental stress.

In order to minimize nutrients being taken up by grasses and other surface-growing plants, fertilizer is often applied directly into a tree's root zone through a method called sub-surface soil injection. This activity also benefits trees by additionally watering and fracturing the soil which helps to alleviate compacted soils.

Often overlooked, but an effective component of supplemental fertilization is the proper

mulching of trees. The decomposition of plant material returns nutrients to the soil naturally. This also has the added benefit of reducing competition from other plants, moderating soil temperatures, and reducing water loss.

A fertilization program, as part of regular ongoing maintenance, can help alleviate problems, common in the landscape and significantly improve overall plant health. ■



Good Fences Make Good Neighbors

Evergreens are often planted to increase privacy and can be an important part of a landscape's character. When planting these natural "fences", it is important to select the proper plant for the site to achieve the desired objective. Whatever the species, hedging plants usually require pruning to maximize their effect and usefulness.

As evergreens grow, typically the oldest foliage is shed each year. This natural needle drop, combined with the lack of light to the plant's interior, can reduce the density of foliage. Further, since the lower branches are the oldest parts of the plant, they are often the weakest and the first to die. After time, it is all too common to see the lowest limbs on a hedge thin or die, reducing or eliminating its function and the original intent of the planting. Just picture a mature white pine with its long, bare trunk and thick canopy high overhead.

Through tested experience, we have developed pruning techniques to influence evergreens' architecture in a manner which retains the lower foliage, keeping it alive and dense. We refer to these pruning techniques as 'A'-shaping. This concept includes reducing the height of a plant and proportionally tapering the sides. This allows increased sunlight to filter through the plant's canopy, but most importantly allows the bottom bows to receive enough sunlight to keep them vigorous and full.

Occasionally, new clients may be initially concerned about the reduction in height and the sparse appearance of the plants immediately after pruning; this look is fleeting. By removing the terminal tips of the branches, we remove the source of new growth inhibitors called auxins. We refer to this as breaking the plant's apical dominance. Without the presence of

auxins, hundreds of pre-existing buds along the branch sprout and cause the plant to thicken.

Some species respond more aggressively after pruning than others. Yews, white pines, and hollies are examples of the best species that produce new foliage reacting to the loss of apical control. Conversely, without proper pruning, the interior of the plant will die.

In every instance, it is important to recognize the intent of the original planting to develop the proper pruning prescription. As arborists, we naturally take a long-term perspective when managing plants to preserve the desired character of landscapes. Robert Frost said, "Good fences, make good neighbors." Similarly, we believe proper pruning can make good neighbors hard to see. ■



'A' shaped pruned white pine hedge retains and thickens its lower foliage preserving this property's privacy.

Winter Moth Treatments

Many area trees experienced devastating damage from the winter moth this past spring. We expect the impact to unprotected trees to be more severe and widespread in 2006.

Further, our ability to treat trees during the limited treatment window, in early Spring when these insects are most vulnerable, is forecasted to be at full capacity. These treatments are designed to protect 80% of the foliage on the tree. To ensure clients needing treatment can be efficiently accommodated, your program confirmation notices will be mailed early in 2006. We find it necessary to require pre-payment by February 28, 2006. After this date, we will accept work for new clients only if additional capacity exists.

Thank you for your understanding. Please feel free to call with any questions. ■



Winter moth: Male adult moths (top) seen in late early winter and resulting spring leaf damage (bottom).

CERTIFICATION

An arborist, by definition, is a trained professional educated in the art and science of managing and maintaining individual trees and shrubs. Arborist certification is a voluntary process by which individuals document their base of knowledge. Certification provides a measurable assessment of one's skill and competence required to perform proper tree care. Certified arborists are required to continue their education to maintain certification status.

The Massachusetts Arborist Association, a professional trade organization founded in the 1930s, has maintained a rigorous certification program initiated in 1957. Hartney Greymont currently employs over 30 Massachusetts Certified Arborists. The International Association of Arboriculture began certifying arborists worldwide in 1992. Many of our arborists are additionally certified by the ISA. While we are moved to be certified, we recognize certification as a baseline level of expertise, and is only the beginning of the proficiency and experience needed to care for our clients and their properties.

GUARANTEE OF SATISFACTION

If you are not satisfied with any treatment or completed job, let us know. We will resolve the situation to your satisfaction; no questions about it. Our goal is to not only make sure your trees, shrubs, and lawn are as healthy as possible, but also to provide you with the peace of mind a satisfaction guarantee can bring.

Did You Know?

Hartney Greymont provides:

TREE AND SHRUB CARE SERVICES

- Shade Tree, Ornamental & Shrub Pruning
- Cabling & Bracing
- Tree & Shrub Fertilization
- Insect & Disease Diagnosis
- I.P.M. & Plant Health Care Programs

LANDSCAPE SERVICES

- Design
- Installation & Construction
- Large Tree Transplanting

LAWN CARE SERVICES

- Fertilization, Weed, Insect & Disease Control Programs
- I.P.M. Lawn Health Care Program
- Seed & Sod Installations
- Over-Seeding, Aeration, Thatching
- Organic Treatment Programs



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