Horticulture Diagnostic Laboratory

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Normal Needle & Foliage Shedding On Evergreens

Fig. 1. White pine exhibiting normal shedding of 1-year old needles. *Note that this photograph was taken on October 12, 2006*. (Thomas Kowalsick, Senior Horticulture Consultant, Cornell Cooperative Extension – Suffolk County)

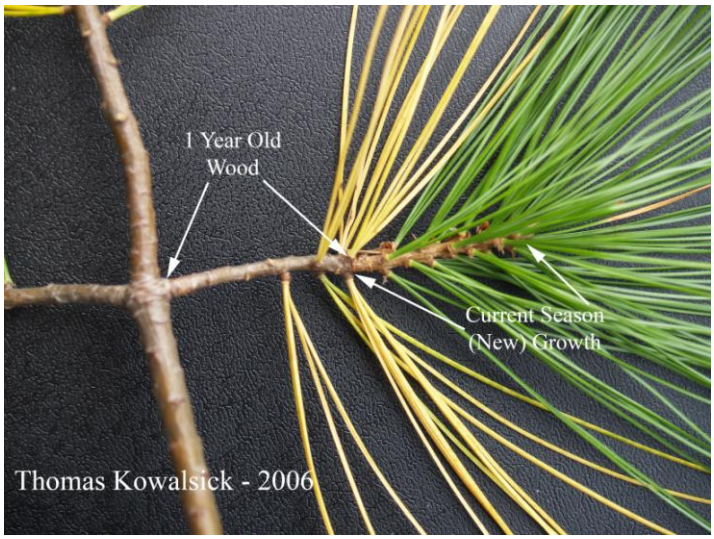

Fig. 2. A close-up photograph (October 12, 2006) showing yellow 1-year old white pine needles in contrast with the current season (new) needles. *Note the difference in bark color/texture between the 1-year old wood and the current season growth. This is a helpful diagnostic toll to determine where the current season growth begins and the 1-year growth ends.* (Thomas Kowalsick, Senior Horticulture Consultant, Cornell Cooperative Extension – Suffolk County)

As the summer days become shorter and autumn approaches, the trees and shrubs in our landscapes begin to take on changes as they slowly progress towards dormancy. Most of us are quite familiar with the foliage color changes of autumn which take place each year on the various deciduous (leaf losing) trees and shrubs in our landscape. Oak leaves turn red or brown, maples yellow, dogwoods red and the list goes on. But what about the evergreens – how do they change in color during the late summer-autumn period?

A common inquiry to the Insect & Plant Disease Diagnostic Lab during autumn concerns the color change and shedding of evergreen needles or leaves. Quite often it is difficult to convince the plant owner that yes evergreens do shed old foliage like the deciduous trees or shrubs during autumn. Sometimes the changes are so dramatic or occur so quickly that one will mistakenly blame a pest or other malfunction for normal foliar senescence and shedding.

Each year evergreen trees and shrubs will produce new foliage and they will shed some of their old foliage. Since the foliage of an evergreen can live from one to several years, the amount of shedding will vary with the individual evergreen species. In most cases the foliage will first turn yellow, then straw colored and eventually brown, at which time it drops to the ground. When viewed from a distance it appears as though the interior sections of foliage are yellow or brown and the only green foliage remaining is closer to the terminal end of the branch.

Pine (*Pinus*) trees produce needles in sets of 2 to 5 per fascicle (bunch). All of the needles contained in an individual fascicle will turn color and be shed off at roughly the same time. Pines shed their oldest needles in autumn. Most pines retain needles for 3 to 5 years. An exception (**Fig. 1** & **Fig. 2**) is the white pine (*Pinus strobus*), which retains its needles for only 1 year. Hemlock (*Tsuga*) and yew (*Taxus*) produce individual leaves (needles) which are attached to a twig. These leaves will drop individually sometimes over an extended period of time. Hemlock and yew can retain needles for 3 to 5 years. Spruce (*Picea*) and fir (*Abies*) also produce single needles on twigs. Many of these

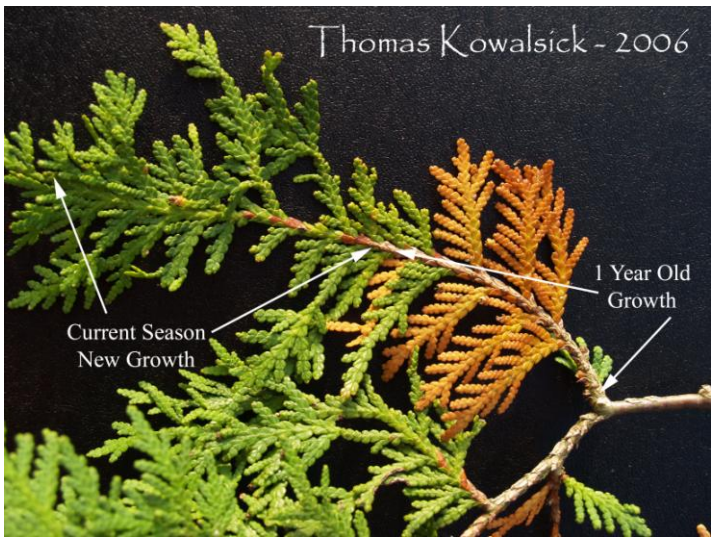

Fig. 3. A close-up photograph of brown 1-year old scale-like foliage on arborvitae in contrast with the green foliage of the current season new growth. *Note that this photograph was taken on October 19, 2006*. (Thomas Kowalsick, Senior Horticulture Consultant, Cornell Cooperative Extension – Suffolk County)

Fig. 4. Rhododendron exhibiting yellowing and leaf shedding of 1-year old leaves. *Note this photograph was taken on September 28, 2006*. (Thomas Kowalsick, Senior Horticulture Consultant, Cornell Cooperative Extension – Suffolk County)

species will retain needles for up to 5 or 6 years. On spruce and fir the shedding of foliage is not always restricted to the oldest needles but it does concentrate in that area. Arborvitae which bears its foliage as scale-like leaves that cover a tiny twig retains its leaves for only 1 year (**Fig. 3**).

What about the broadleaf evergreens such as rhododendron and azalea (*Rhododendron*), holly (*Ilex*) and Mountain laurel (*Kalmia*)? These plants produce leaves individually on their stems. Holly and laurel will retain their leaves for only one year. The rhododendrons and azaleas will sometime retain their leaves for 1 or 2 years. Holly, unlike most other evergreens shed their one-year-old leaves in the spring as soon as the new leaves start growing. Many species of rhododendron shed leaves in autumn (**Fig. 4**), but it is not unusual to find some species shedding leaves at other times during the season. Leaf shedding on these plants is often influenced by environmental factors such as drought stress and severe winter weather.

Often leaf or needle shedding goes unnoticed in some seasons. This can occur when new leaves or needles conceal old foliage which is shedding on interior sections of the plant. But in some years it may be very noticeable, especially on white pine and arborvitae and this is often due to varying rates of growth from season to season. The length of stem and needle growth may be reduced during years when drought conditions prevail in comparison to a season when maximum stem and needle length occur. When this scenario occurs it is not uncommon to find that more than 50% of the needles/foliage wound shed in autumn. Some other factors which can affect the length of stems, needles, and leaves in any one season are recent transplanting, root damage from construction or trenching, soil compaction, and poor soil drainage as well as disease and insect pests.

Old yellow and brown foliage/needles that shed and appear on interior sections of evergreens during late summer and autumn seldom indicate a serious problem. Occasionally, pests are involved. But more often than not we will diagnose this yellowing to be a normal phenomenon. Remember that normal leaf and needle drop occurs every year on every evergreen.

Prepared by Thomas Kowalsick, Senior Horticulture Consultant, Cornell Cooperative Extension – Suffolk County, 11/92, revised 11/2006.

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