The Plant Doctor's LANDSCAPE TIPS

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CONIFER NEEDLE BROWNING: IS MY TREE DEAD?

Photo 1: This interspersed group of pines along a roadway demonstrates the susceptibility of white pine to salt spray and high wind desiccation, resulting in brown needles by the end of winter and early spring. Note that Austrian pine is more tolerant of this harsh environment, but, similar to other species of introduced conifer, may be more prone to diseases and insect pests.

Photo 2: These potted spruces at a nursery were presumed to be dead after a harsh winter. Examination of the buds and cambium showed viability; these trees would return to good health and appearance despite the needle browning.

Photo 3: These arborvitae were severely damaged from salt spray and winter desiccation. Despite their appearance, they are still viable and would likely recover.

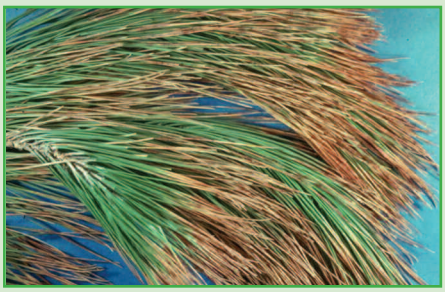

Photo 4: This is typical needle browning (desiccation) on Austrian and Red pine. The symptoms closely mimic those caused by the disease, Dothistroma needle blight.

INTRODUCTION:

Conifers are viewed by the general public as "evergreen." However, some species of conifers, such as larch and dawn redwood, are deciduous, meaning they lose their needles every year, just as most deciduous trees (maple, elm, ash, etc.) do. Even so, many "evergreen" species, such as spruces, pines, firs, etc., may encounter pests, diseases, environmental stresses and cultural problems that cause needles (conifer leaves or foliage) to become brown or to be cast from trees. Conifer needle browning is most often noticed in the spring when many individuals mistake conifer needle browning for death of their trees (Photos 1, 2, and 3). In the present usage, conifer needle browning will include those problems caused by cultural and environmental problems, rather than those caused by diseases and pests.

CAUSES OF CONIFER NEEDLE BROWNING:

Depending on the cause and location, all species of conifers may be affected with conifer needle browning. Deicing salt is one of the most common causes of needle browning (Photo 3). Salt spray desiccates needles, causing them to turn brown after repeated exposure. This problem is especially prevalent along roadways where high-speed travel creates frequent salt mists. Deicing salt and fertilizer salt may also build up in soils or irrigation water; high salt levels around plant roots may create an osmotic imbalance to such a degree that roots are injured or cannot take up moisture from the soil. Such osmotic stresses may reduce growth and cause needle browning. In extreme situations, trees may die. High winds also may contribute to needle browning. Corridors of increased wind speeds that contribute to needle browning may develop around buildings or through various landscape designs. In order for conifer needles to remain green and succulent, they must be replenished with moisture after transpiration losses of water. Frozen ground during the winter months may prevent the uptake of moisture; needles will often desiccate and become brown (Photo 4). Severe drought may cause similar symptoms. Many of these factors may be working in unison to cause needle browning.

CONIFER NEEDLE BROWNING MANAGEMENT:

One of the first considerations when managing needle browning is being certain of a correct diagnosis of the problem (Photo 5). Brown foliage on conifers may be caused by a variety of diseases and insects, in addition to environmental and cultural issues. Of utmost consideration is that needle browning induced by a variety of factors is often not lethal to conifers. Prevention is a key factor for managing needle browning by considering the right plant in the right place. White pines, which are very susceptible to needle browning, should not be planted along highways or in wind corridors, where their delicate needle structure makes them more prone to needle browning. Austrian and Scots pines tend to be more resistant to wind and salt spray and are better adapted to such harsh environments; however, Austrian and Scots pines, as introduced species of trees, are more prone to diseases and insects. Obviously, avoiding high salt levels in the soil and irrigation water will help to prevent needle browning. Avoid drought if possible. Physical methods can also be adopted that help prevent needle browning; these include erection of barriers in special locations for protection during the winter months. Another consideration may be foliar applications of anti-desiccants, such as the product Wilt Pruf, for protection of vulnerable plants during the harsh winter season or at other times. Many conifers exhibit intermittent and chronic needle browning year after year; most survive just fine despite their appearance.

Photo 5: A good sign that these brown conifers, white pine in this case, are viable can be witnessed by the new growth emerging in the spring. With white pine, the brown needles will be naturally cast from the tree within a year or two. Other conifers react similarly. Another test for viability is to check for a green, succulent cambium layer directly beneath the bark on twigs.