



Extension FactSheet

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Yellowing, Dieback and Death of Narrow-Leafed Evergreens

Stephen Nameth and Nancy Taylor
Department of Plant Pathology

Jim Chatfield
Ohio State University Extension

Each year various narrow-leafed evergreens such as pines, Taxus and spruce are affected with needle yellowing and browning, dieback, poor vigor or death. These are problems often associated with one or more environmental stress factors. An explanation of some of these stress factors follows.

Wet Soil

Excessive amounts of water can result in a saturated soil, reducing oxygen levels to a point where small roots weaken or die. This root decline can be sudden or gradual and the roots may be invaded by various soil-borne fungi. Continuous wet conditions lead to progressively worse situations. If the top of the plant is unable to obtain the necessary water and nutrients, it declines or dies. However, the evidence of death (needle browning) often occurs at a much later date. An example is Taxus, or yew, planted in a heavy clay sub-soil with no sub-surface drainage. In fall, winter and spring, water accumulates and literally drowns the roots. The tops of the plant may not succumb until the following spring or summer, when hot weather first arrives and stresses the plant. Some evergreens appear to lose vigor and die back after 15 to 20 years. This often is the result of injury to the root system from moisture stresses. Heavy soils may limit development of the root system; root damage easily upsets the top-to-root ratio. Dieback and poor growth are often evident. Changes in sub-soil drainage caused by construction will often cause roots on older plants to die back.

Drought or Dry Soil

The lack of water for long periods may result in symptoms similar to those caused by excess water. Clay soils often pull away from the roots as they dry, drying or breaking the fine roots. Drought stress may be especially noticeable in the summer on evergreens planted on well drained sites (sand or gravel), or where roots are in the top layers of heavy compacted soil. Excessive needle drop and poor vigor are often evident as a result of drought stress.

Winter Damage

Evergreen plants transpire or lose water from leaves during winter. If the soil moisture is low or roots are unhealthy, moisture in the needles is not replenished and needles are killed. Again, visible symptoms often do not appear until spring or early



Figure 1. White pine planted in a poorly drained, wet site.



Figure 2. Road salt damage on white pine.

summer. Damage often appears on one side or on one branch of the plant, usually the side facing prevailing winds. Needles may turn brown one half or one third of the way from the tips. The extent of browning will be similar on all the needles on the branch.

De-icing Salt Damage

Injury from exposure to de-icing salt can occur on plants. Salt sprayed by traffic on wet roads can cause browned foliage, usually on the side nearest the road. Salt solution runoff also can injure plant roots. Entire plants may die. Needle yellowing and browning often begins at the tips and gets progressively worse. Sometimes soil tests conducted in late winter indicate high salts and confirm the diagnosis.

Herbicide Damage

Injury to evergreens by herbicides is difficult to assess. Symptoms are not always pronounced. Needle distortion may be slight, but root damage could be enough to limit water uptake. Tip damage to new growth is a common symptom with some herbicides. Look for needle distortion and twisting, or needle yellowing or browning, depending on the type of herbicide. On spruce, needle purpling and drop is common.

Air Pollution Damage

When atmospheric conditions allow buildup of smog or air pollutants, narrow yellowed bands may develop on the needles of susceptible plants. In other cases, the tips of the needles may turn brown. Ozone injury to white pine will cause a severe reduction in growth. If this continues for years, it is considered chlorotic dwarf disease. Trees under drought stress may be more prone to damage by air pollutants.

Low Light Needle Drop

Most narrow-leaved evergreens need full sunlight. Low light conditions may result in a slow decline of some evergreens such as junipers or arborvitae. An early symptom is foliage drop in the center of the plant. The condition is common on plants existing in overgrown, old landscapes. Sometimes two plants will grow together. Both will begin to decline. In other cases, a deciduous plant nearby may begin casting a shadow on the evergreen plant during the morning or evening hours.

Transplant or Establishment Problems

Improper planting and poor after-transplant care may result in plant decline several years following transplanting. Common problems associated with planting and establishment include: burlap, especially synthetic burlap, left intact around the root ball; strings or wires left around the trunk; planting a containerized plant without disturbing the root mass; inadequate or inappropriate watering following transplanting; support wires left on the tree too long; setting the tree or shrub deeper than originally grown; and settling following transplanting. These problems are difficult to correct after symptoms have become apparent.

Managing Environmental Stresses

It is difficult to develop a control program for environmental stresses. A wet soil suggests need for a better drainage system or that less watering is required. A dry soil indicates the need for a better and more uniform watering program or using an effective mulch. Mulching, proper watering, use of a wind barrier or spraying with an antidesiccant in late fall helps lessen winter damage. Vertical mulching or core aerating will improve landscape soils. It will hasten drainage of excessive water, preserve necessary aeration during wet periods, allow sub-soil water penetration during dry periods and promote the formation of fine feeder roots. Drill 1 or 2-inch wide, 18-inch deep holes in the soil on 12 to 20 inch centers under affected trees. Fill holes with a mixture of equal parts of peat and a coarse aggregate, such as pumice or calcined (baked) clay particles. Control de-icing salt damage by re-directing runoff water, installing splash or spray guards or by using tolerant plants in injury prone locations.

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Keith L. Smith, Associate Vice President for Ag. Adm. and Director, OSU Extension
 TDD No. 800-589-8292 (Ohio only) or 614-292-1868

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