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2005 UPDATE ON THE EASTERN RED CEDAR PROBLEM

Last year, in late March and early April 2004, The Plant Disease Information Office received an unusual number of phone inquiries and samples of ailing Eastern red cedar, *Juniperus virginiana*, from throughout the state. The calls and samples continued into May. This year, we received more calls and samples from symptomatic trees, some of which showed symptoms last year and continued to decline and some of which were on trees exhibiting symptoms for the first time. During 2004, similar symptoms were reported on red cedars from northern New Jersey into southern New York (Long Island) and southern Massachusetts. No symptoms were reported from more northern eastern states such as New Hampshire, Vermont, or Maine.

SYMPTOMATOLOGY AND POSSIBLE CAUSES

Although this native species is usually considered relatively trouble-free in Connecticut, for the past two years, dramatic and conspicuous damage was visible on trees in all age and size classes, care regimes, and locations, including natural stands and managed landscapes. Severely affected trees appeared distinctly off-color from a distance. Upon close inspection, a range of symptoms could be observed, which included needle browning and drop, primarily of older, inner needles, tip and twig dieback, and branch death. In extreme cases, entire trees turned brown. These symptoms were not distinctive or diagnostic. We have had reports of trees without a history of symptoms or problems exhibiting extensive symptoms in both spring 2004 and 2005. Trees in compromised sites (e.g., exposed to road salt, increasing levels of shade) also exhibited a range of symptoms. In some cases, new growth was observed at the bases of small, dead twigs. This suggested that cambial tissues were still viable on some of the larger-diameter wood, despite extensive needle browning, drying, and premature drop.

After two years of examination of samples, no pathogens, insects, or mites have been directly associated with these symptoms. However, efforts to further characterize and identify the cause(s) are still ongoing. The occurrence of symptoms in a localized area of New England during 2004 provides further evidence for an environmental phenomenon or series of events. One possible scenario to explain the development of the symptoms includes damage from weather conditions of this past winter that occurred on trees previously stressed by several years of dry conditions and the extremely wet conditions of the 2003 and 2004 seasons. Although most years, some level of winter damage can be observed on red cedar in spring, the proposed scenario suggests the cumulative effects of these weather factors resulted in greater than usual damage. Both winters of 2004 and 2005 were quite severe. Winter injury results from many

environmental factors, which have little in common other than they occur during the winter. Examples of these diverse factors include cool summers followed by warm autumns and sudden drops in temperature, dramatic temperature fluctuations, freeze-thaw cycles, unusually warm, midwinter temperatures, extended periods of extreme or abnormally cold temperatures, and drying winds. Winter desiccation is common on red cedar and results from factors that create a water deficit in the tree. Injury occurs when water evaporates from needles on windy or warm sunny days during the winter or early spring. Drying occurs because this water is not replaced since the roots cannot take up enough water from cold or frozen soil. Lack of water, or drought, normally doesn't cause problems for red cedar since they are considered to be drought-tolerant. However, extended dry periods for several consecutive years can result in root damage. This damage is often observed in groups of trees rather than in isolated individuals. Excess water can also create periods of waterlogged soils and short-term anaerobic conditions. Red cedar has low anaerobic tolerance. Fact sheets with more detailed information on drought, excess water, and winter injury are available on the Experiment Station website (<http://www.caes.state.ct.us/FactSheetFiles/IndexHeadingFiles/FSlisting.htm>) or upon request.

The damage to the red cedars that we've observed for the past two years is significant but also serves to predispose and weaken the affected trees. This makes them more vulnerable to secondary or opportunistic pests. Among these less serious or secondary problems are tip and twig blights caused by *Phomopsis* and *Kabatina* and cankers and diebacks caused by *Botryosphaeria*. In addition, stressed or weakened trees are more attractive to a number of arthropod pests, including the smaller Japanese cedar longhorn beetle. Consequently, it might be wise to check for infestations next season. Infestations of this longhorn beetle can be recognized as serpentine tunnels on the main trunk or on larger-diameter branches.

Last year, many trees appeared to recover, as evidenced by new growth. However, other trees continued to decline and had substantial and permanent damage, often leading to tree death.

STRATEGIES FOR MANAGEMENT:

Although the weather can't be controlled and there are no obvious "cures" once the damage is done, there are steps that can minimize the impact of this problem. These include:

- Use sound cultural practices to promote tree vigor;
- Have sufficient moisture in the root zone before the soil freezes-- this can be accomplished by giving the trees a deep watering before the ground freezes in the fall; mulching also helps to increase moisture retention in the winter;
- Avoid late summer and early fall fertilization-- this stimulates and encourages growth late in the season which may not harden-off properly for the winter;
- Prune and remove any dead twigs or branches;
- Scout for secondary invaders and/or opportunistic pests.

Since we are continuing to monitor this new problem, you can contact the Experiment Station for the most current information.

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