THE DECLINE OF SUGAR MAPLES (ACER SACCHARUM)

Sugar maples across the northeastern US and eastern Canada are in decline. The problem is not new, but the incidence and severity of maple decline have increased markedly in recent decades to include urban, sugarbush, and forest environments (Horsley et al., 2002). Symptoms include reduced foliage and reduced twig growth, and the eventual dieback of branches in the upper canopy. The first noticeable symptom is usually premature yellowing or reddening of the foliage. The exact causes of sugar maple decline are hard to pinpoint. The current consensus is that maple decline is a progressive disease condition that begins when the trees are altered initially by stress and continues as they become invaded by organisms of secondary action (Bauce and Allen, 1992). It is the activity of these secondary pathogens on an already weakened tree that eventually leads to the death of the tree. Sugar maple decline does not spread like a disease, but if one tree is affected because of environmental conditions, chances are that other trees near it are, or will become, affected. There are cases, however, possibly due to differences in soil topography (Sauvesty et al., 1993), where the relative declines of adjacent trees vary dramatically. This month’s Hot and Classic examines some of the controversies surrounding the cause of sugar maple decline and its ecological consequences.

Eco logical Consequences

In addition to its importance to the maple syrup industry and in horticulture, sugar maple is a keystone species in the forests of the northeastern and midwestern United States and eastern Canada. The decline in the health and numbers of sugar maples appears to be altering the local ecology of those areas affected. For example, leaf flycatchers (Empidonax minimus) nest-
in the health of sugar maple stands in an area of study after the 1980s suggested to them that the severe maple decline in the 1980s was not due to anthropogenic pollution. Studies that have examined the effects of altering the soil pH on the progress of maple decline have yielded mixed results. Liming (e.g. Moore et al., 2000) and K fertilization (Ouimet and Fortin, 1992) increase the vigor and growth of sugar maple in an acid soil, poor in available Ca and Mg. Four years after the lime application, improvements in foliar concentrations of N, P, Ca, and Mg were noted. Liming also increased the radial growth of sugar maple compared with control trees. Acidifying fertilizer, however, did not produce the visual symptoms of maple decline (Hutchinson et al., 1998). Thus, while acid rain may be contributing to the stress and decline of sugar maple, it may just be one of many factors.

LITERATURE CITED


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