The Plant Doctor's LANDSCAPE TIPS

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GIRDLING ROOTS

INTRODUCTION:

Tree decline that ultimately results in death is often attributed to a variety of causes. Among many potential causes, construction injury, compacted soils, soil pH and nutritional imbalances, poor drainage, diseases and insects or combinations thereof are often associated with tree decline. Not often considered with tree decline is the impact of girdling roots (Photo 1 and Inset). A tendency for girdling roots to develop is very common among some tree species, Maple, for example, and with certain cultural practices. In some cases, the appearance of "girdling roots" may not be contributing to tree problems and is incidental to other tree issues. In many cases, however, girdling roots may be the primary cause of tree decline and may predispose trees to attack by other secondary agents such as insects and diseases.

SYMPTOMS AND CAUSES OF GIRDLING ROOTS:

Girdling roots are defined as roots that cut off or choke off other roots or the trunk/stems of plants, primarily trees. Girdling roots may begin as normal root development but because of their growth habit, constrict the growth of other plant tissues as the root expands and becomes restrictive. Girdling roots may be initiated by many factors. Improper planting is a major contributor to development of girdling roots (Photo 2). Not providing sufficient space for roots and/or failure to spread roots out during planting or planting into compacted soils which roots cannot readily penetrate are primary instigators of girdling roots. Excessive mulch also contributes to girdling root development; excessive mulch stimulates root development into the mulch where, over time, they invariably encircle the trunk (Photo 3). Another common landscape practice is to disturb the soil around trees to install perennials and annuals. Damage from construction projects may also stimulate girdling roots. As with most girdling root situations, the problem is not recognized until the tree begins to decline. Even when decline is recognized, girdling roots are probably not given sufficient credit for the observed damage. Admittedly, it can be difficult to accurately assess girdling roots because many girdling roots are below ground. Often, girdling roots create flat sides or depressions on tree trunks above the girdled area; in other words, normal trunk flare into the root collar is lacking (Photo 4). Invariably, symptoms of girdling roots result in tree decline and perhaps death.

GIRDLING ROOTS MANAGEMENT:

The first offense against girdling roots is prevention; avoid conditions that stimulate girdling root development. Proper planting efforts, avoiding excessive mulch and the avoidance of soil disturbance or construction damage in the vicinity of the trunk are cultural methods that may help prevent girdling roots.

Early recognition and detection of girdling roots is an important factor in correcting the problem; some girdling may be severed and removed to allow recovery and the resumption of normal growth by the tree. High-pressure hydraulic air tools, such as the air spade and air knife, can be helpful in assessing whether girdling roots are a factor in the stress or decline of the tree (Photo 5). Trees with advanced decline caused by severe girdling may not respond to remedial efforts.

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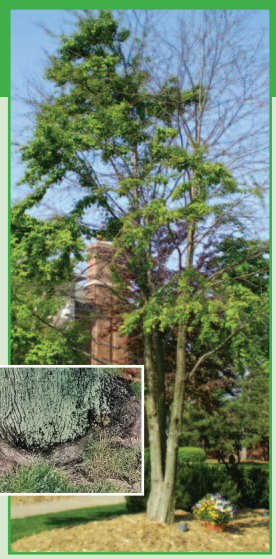

Photo 1. This tree shows the typical decline symptoms associated with girdling roots. Soil disturbance may contribute to the development of girdling roots and/or the introduction of diseases into trees. Inset: Typical "appearance" of girdling roots, which may or may not be causing problems.

Photo 2. In a particularly acute case of girdling, many Austrian Pines died after transplanting into landscapes. These girdling roots resulted in the nursery from improper planting when the trees were young.

Photo 3. Excessive mulch contributes to development of girdling roots by stimulating root growth in the mulch . . . these roots invariably begin encircling the tree's trunk.

Photo 5. The air spade was used to remove soil from around this declining tree, exposing severe constriction from girdling roots.

Photo 4. This tree exhibits the "appearance" of abundant root girdling. Note flat side of trunk (right side) which probably indicates a girdling root below grade.