

## Ohio State University Fact Sheet

### Horticulture

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### Girdling Roots -- A Problem of Shade Trees

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Trees can slowly weaken and die over a period of years or decades because of root girdling. Roots begin to grow around the main stem of the tree and cut off or restrict the movement of water, plant nutrients and stored food reserves.

Over time, growth of the branches on the side of the plant affected by the girdling will be slowed. As injury progresses, leaves will become smaller and lighter green, fewer leaves will be produced, and eventually the branch will begin to die back. Death of the entire plant can occur in five to 20 years; watering, fertilizing and pruning will do little to correct the problem.

Certain trees are more prone to this problem than others. Lindens, magnolias, pines, and maples other than the silver maple are susceptible to root girdling. On the other hand, oaks, silver maple, ash, and elm are well known for their ability to form functional root grafts and are rarely adversely affected by girdling roots.

Normal trees have a gentle trunk flair or buttress at their base (Fig. 1). Trunks that grow straight up from the ground as though they were a telephone pole can be suspected of having girdling roots (Fig. 2). Trunks with a straight side or a concave depression on one side may also have a girdling root (Fig. 3).

Development of girdling roots is not well understood but is normally thought to be the result of unfavorable conditions which prevent roots from growing out in a normal spreading manner. A good example is a container-grown plant, where the roots are often forced to grow in a circular fashion. If these trees are not pruned at the time of transplanting, this growth pattern can cause **girdling roots**.



**Figure 1**



**Figure 2**



**Figure 3**

Root pruning is an absolute must for any container-grown tree or shrub at the time of transplanting. Three to five slashes are made vertically down the rootball and about an inch into the rootball. One or two slashes into the bottom of the rootball are made at a depth of three to four inches. Some people go further by fraying out the pruned roots.

Restricted root space--such as tree pits in urban areas--also may result in girdling roots. There is some suggestion, too, that constant mulching--a desirable practice in many respects--may cause the formation of girdling roots.

For plants susceptible to root girdling, an inspection should be made when the tree is approximately six inches in diameter. A positive diagnosis can only be made by exposing the roots. Soil is carefully removed to a depth of at least 12 inches, with care taken to prevent serious mechanical injury to the roots. If girdling roots are found on a plant with known susceptibility, the girdling root must be removed, a process normally carried out with a chisel.

Removing a girdling root is a wound in its own right. Yet, while the correction of the problem can kill the desirable plant, the likelihood of the plant dying is greater if no action is taken. Conducting a preventative inspection when the tree is about six inches in diameter will assist in correcting the problem before it becomes serious.

If the inspection reveals girdling and a considerable amount of damage, the most prudent move may be to replace the tree. Spending money on a weakened tree which subsequently dies can be an extremely frustrating experience; because correction of this problem is so labor intensive, the costs and benefits should be weighed carefully prior to making any decisions.