

TREE ROOTS AND FOUNDATION DAMAGE

By Gary Watson

Reports of building foundation subsidence have been increasing since the drought in 2005. Cracking of walls or windows is usually the first symptom noticed. Trees are sometimes blamed for subsidence of foundations. While trees can occasionally contribute to foundation subsidence by extracting water from the soil beneath them, very specific 'conditions' are required (These conditions are not often encountered in the Midwest.):

- The subsoil beneath the foundation must have a moderate to high shrink-swell capacity.
- There must be unusual soil drying from severe drought.
- Roots must be growing near the base of the foundation, extracting soil moisture.

Soil surveys such as those found at <http://soils.usda.gov/survey> provide much information (including shrink-swell capacity and suitability for dwellings prior to development) about the native soil. In some cases a building could be built entirely on fill soil; therefore interpret the surveys carefully. A soil test may be needed. Furthermore, when soil is rewetted it will swell again causing the foundation to return to its original position. Any cracks created by the subsidence will remain.

Foundation depth is important. The shallow foundations of older buildings in England subside frequently in drought years because the shallow soils dry faster and the tree roots have easier access. In the United States and particularly in the Midwest, full basements are common and it takes significant drought to dry these deeper subsoils sufficiently for the soil to shrink and cause damage.

It is not easy for roots to grow down to the base of a basement foundation and survive the seasonally wet conditions. Aggressive rooting bottomland species (i.e., willow, honeylocust, silver maple, and elm) are more likely to cause subsidence than slow growing upland species (i.e., oak and sugar maple).

Subsidence is more likely to occur with shallower foundations, more severe droughts, and higher tree water requirements. Since the drought of 2005, companies have been advertising foundation repairs for damage caused by the drought. City arborists are receiving calls to remove trees circumstantially blamed for the damage. Foundation damage can occur from subsoil shrinkage during drought in the total absence of roots.

CONFIRM THE INVOLVEMENT OF TREE ROOTS FIRST

Before any tree is cut down, the presence of tree roots at the base of the foundation should be confirmed. Many trees have been cut down needlessly just because they were nearby. Roots normally grow horizontally and not very far beneath the soil surface. Sometimes when roots encounter the looser backfill soil near the foundation, they can abruptly start growing down. You may be able to locate these roots, if they exist, by digging a foot or two deep within a few feet of the foundation. If you find a suspect root, cut it off. Unfortunately, in some cases excavation down to the base of the foundation may be necessary. This may have to be done anyway to repair and stabilize it. Cutting the roots should prevent future problems, especially if a root barrier is installed to prevent re-growth.