



# Why Do Some Bare-root Seedlings Die?

*By David Mercker, University of Tennessee Extension Forester*

**M**illions of seedlings are planted each year in the U.S. – some as part of large scale forest management projects - others in urban or yard settings. Typically, the easiest and therefore least expensive seedlings to plant are those that are “bare root.” Bare-root seedlings are devoid of any attached soil. Once planted, landowners and homeowners sometimes are discouraged over the less-than-favorable survival. Below is a brief summary of why bare-root seedlings might perish. These reasons apply regardless of the intended purpose of planting or the location of planting.

**Care** – Seedlings are living, growing organisms, even if they are dormant at the time of arrival. If not properly protected during transport from the nursery to the planting site, and during the planting operation, they can die. The most common problems are over-heating and desiccation [lack of moisture]. In some cases, without proper care, they may already be dead by the time of planting.

**Inadequate Planting Depth** – Young seedlings should be planted equal to or slightly deeper than the depth previously planted at the nursery (note, this is not the case with larger balled and burlap trees). Normally the original planting depth will be apparent by the appearance of a root collar, a slight swelling where the above-ground portion previously met the soil line.

**Planted Too Late** – Early planting allows time for the soil to settle as well as the initiation of root development prior to

warmer temperatures. It is well documented that survival declines as planting date is delayed.

**Precipitation Throughout the Growing Season** – Moisture is vital for all vegetative life, but it is critical for new plantings. Unlike established trees, newly-planted seedlings will not have developed expansive root systems capable of seeking and finding scarce sources of water.

**Excessive Root Damage** – In the lifting, processing, and planting of seedlings, roots can be accidentally torn or intentionally pruned (to make planting easier). Neither is desirable. Before a seedling can grow, it must have a functioning root system to supply moisture and nutrients to the top. Damaging roots hinders this process.

**Wildlife and Insect Damage** – The energy stored in trees is a potential source of nourishment for wildlife and insects. Sometimes damage is minimal, such as removal of a few leaves or buds; other times it can be substantial. Feeding occurs in three regions: the growing (expanding) points, the cambium (located just beneath the bark), and below ground in the roots.

The death of tree seedlings occurs from a variety of reasons, and those reasons are not always apparent. Yet in most cases, with a little detective work, the cause of mortality can become evident. And more often than not, the leading cause of mortality is water-related. For additional information on the proper tree planting procedure, see: [http://www.forestry.alabama.gov/PDFs/Seedling\\_Care\\_&\\_Reforestation\\_standards.pdf](http://www.forestry.alabama.gov/PDFs/Seedling_Care_&_Reforestation_standards.pdf) or <http://www.utextension.utk.edu/publications/spfiles/SP663.pdf>. ☎