

Drought Stress and Trees, Larry Figart, Urban Forester

This spring has not been so good for trees. The hotter and dryer than normal weather has caused many trees to become stressed. We do not think of having to provide supplemental irrigation to mature trees, but in certain cases it may be warranted. There are three primary reasons why trees are stressed this time of year. The three factors are drought, heat, and root disease. If you notice your tree not looking like it should, it may be from one or more of these issues.

Drought: In Northeast Florida, we typically have a dry spell March through May. This year it seemed a little worse than normal. From the beginning of 2012 to date, we are almost eight inches below normal according to data from the National Oceanic and Atmospheric Administration. Add the almost seven inch deficit from last year and you can see why our landscapes are dry. Trees need water to perform many of their basic functions. For example, trees use carbon dioxide and water in combination with sunlight in photosynthesis. In other words they use water to make their own food. If there is a shortage of water, the tree produces less food for itself. So in other words trees starve during droughts.

Heat: If you have lived in N.E. Florida very long you know that our summers are hot. In a typical summer we have at least ten days where the temperature exceeds 95 degrees. In plants, and our trees as well, hot temperatures can increase water loss through the leaves. The process by which water is evaporated through leaves is called transpiration. Transpiration is why we feel much cooler under the shade of a large tree. A large tree has been estimated to transpire 120 gallons of water a day during the summer. Trees are impacted when temperatures stay hot for long periods of time and the trees have trouble replacing the water lost during transpiration. If more water is lost than the tree can pick up through its roots, it is stressed. The roots cannot extract water from very dry soil. Periods of persistent stress cause rapid decline in trees.

Root Disease: Root disease is the factor that ties all this together. Root diseases are caused by fungi. Common root fungi are Armillaria, and Ganoderma. Armillaria and Ganoderma are naturally occurring fungi that cause decay in wood. They are found in

the soil and enter trees through root wounds. Frequently the root is wounded during some sort of activity of man. This can include lawn-mower damage, roots cut during construction, or roots severed through utility installation. These root fungi can colonize the root system and persist in the tree unrecognized for years or decades in some cases. Bit by bit, year after year, the root fungi compromise the trees' ability to take up water. At some point in time the tree root system is compromised where it cannot supply adequate moisture to the crown of the tree and the tree dies. This death can appear "sudden" during periods of high heat and drought. However, in most cases, trees colonized by root decay fungi often take months or years to die. Their foliage progressively becomes thinner and thinner with an increasing amount of branch dieback until it is obvious that the tree must be removed.

What Should We Do? While there is no solution for root disease, we may be able to give our trees some relief from the stress. Add an inch of water through irrigation to wet the top 12 inches of soil every two to four weeks in extended drought. Apply water to all soil under the canopy if possible. This may take several hours or more depending on what type of application devices are available to you. If you have limited time to devote to your trees, we think it is better to completely wet a small area than to only wet the surface a few inches over a large area. Limit pedestrian, mower, and vehicle traffic under the tree. Be sure you comply with local water restrictions.



Southern magnolia dropping leaves because it is under severe drought stress. Photo Credit: Ed Gilman