THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences

Trees Can Suffer Heat Stroke, Too

Extreme heat can injure trees. The north Georgia mountains average more than 20 days per year above 90 degrees, and the coastal heartland averages more than 100 days above 90. Such heat loads can influence the way trees grow.

As a rule, trees grow best from 70 to 85 degrees, according to University of Georgia experts. Their temperature normally runs just above that of the air. Trees cool themselves by reradiating heat, transferring heat to the air and evaporating water from leaves.

The latter is a major mechanism of tree cooling. Without this evaporative cooling, reradiating heat and wind cooling are the only means of keeping trees near air temperatures.

Heat makes the air much drier and causes leaves to lose water fast. As the leaf closes down, a tree can't cool itself as well, and its leaf tissues can heat up above the heat death threshold — around 115 degrees.

A compounding problem of rapid water loss and temperature increase is a delay in the roots' water intake. Leaves can lose water much faster than the roots can absorb it. A water deficit develops in the tree and can start many problems.

Heat injury is most prevalent during the midday and afternoon. The tree corrects the day's shortages over night if water is available. The roots' night uptake can amount to 40 percent of the tree's water needs.

Heat injury in trees includes scorching of leaves and twigs and sunburn on branches and stems. In leaves, wilting is the first major sign of excess water loss and heat loading. Then they'll turn fall colors, die and fall off.

Under heavy heat loading, leaves begin to take themselves apart, if they have time, and then brown out and finally fall. Leaves quickly killed by heat are usually held onto a tree by tough xylem tissue and the lack of a prepared splitting zone. Early leaf fall, even of green leaves, is a symptom of water and heat stress.

The bare soil surface, or other hard surfaces, reflects and absorbs heat. In full sunlight, the soil surface can reach 150 degrees.

Trees in containers in full sunlight can be under large heat loads that quickly injure roots and shoots. Depending on their color, exposure and composition, containers can quickly absorb large amounts of heat. For instance, black plastic containers can absorb radiation at 9 degrees per hour until they reach 125 degrees or more.

University of Georgia Cooperative Extension specialists say treat trees for heat stress syndrome using the following tips:

- Water, sprinkle and mist to improve the water supply and cool tree tissues.
- Partial shade to reduce incoming radiation and control hot, dry winds.
- Reflect and dissipate heat using colorants and surface treatments around the landscape and on trees.
- Use low-density, organic surface covers such as mulches, ground covers and hard surface blankets.
- Use well-designed active shade structures in the landscape, such as arbors and trellises.
- Establish better tree-literate design and maintenance practices that deal with heat problems.

Source:
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