

Just-In-Time Rain

Before the rain we got back on August 18th and 19th, things were looking pretty bad around our place. The grass had long since turned brown and many of the perennial flowers and shrubs were in a serious condition of wilt. Most worrisome was that a number of our large post oaks were beginning to drop leaves and the ground under them was beginning to turn brown with all of the leaves that had fallen off.

My records indicated that we had had only around 9 inches of rain so far this year and it had been over a month since the last rain in July. To make matters worse, we had just used up almost all of the rainwater in our tanks just trying to keep the most seriously threatened plants alive in the near 100 degree heat of mid-summer. (We try to use as little well water as possible from the aquifer so as not to use more than our share of the ground water.)

The first response of most plants to a lack of water is to close the stomata (microscopic openings in the surface of leaves) to prevent the loss of water by evapotranspiration. This helps to keep the water the plant already has in its tissues, but it also shuts down the process of growth and renewal—the plant remains alive but nothing is happening inside its cells. Closing the stomata prevents the loss of water, but it also prevents carbon dioxide from entering the leaf cells, and without carbon dioxide, photosynthesis can't take place so no new carbohydrates are produced which means no new roots, leaves, stems, seeds or flowers.

If the conditions of the plant don't improve, over time the leaves may continue to lose what little moisture remains and chlorophyll may begin to degrade and the leaves turn from green to brown. For some plants like grasses, if moisture returns to the roots and is taken up by the leaves, chlorophyll production can resume and the leaves turn green again and the chemical processes within the plant return to "normal". For other plants like trees, once the leaves are brown, those particular leaves are probably dead and unlikely to green up again.

So the dropping of leaves from some of our post oaks indicates that the tree has insufficient moisture to carry out normal functions—the more leaves it drops, the more serious the situation. It doesn't necessarily mean that the tree is dead or even that it is going to die, but it is clearly severely stressed. We had one post oak last year that lost 80-90 percent of its leaves late last summer, but came back apparently healthy this year. That tree again began dropping leaves before the last rain.

It is not uncommon for otherwise healthy trees to drop leaves in dry times and to recover the next year—cypress trees are one species that does this fairly often. But the more often it happens and the greater the amount of leaves affected, the more damage is done to the tree's resources and the less likely the tree will recover completely. My

greatest concern is that stressed trees, especially blackjack, post and Spanish oaks are susceptible to hypoxylon fungus (which tends to strike mainly stressed trees), so that even if the tree were otherwise capable of recovering, it could later succumb to hypoxylon.

The nearly 2 inches of rain we got last week certainly served to green up the grass and to brighten up the wilting perennials. Two inches of rain might have been enough to soak deep enough into the ground to reach tree roots and that may have been in time to prevent the further loss of leaves and to ward off further stress for a few weeks anyway. Only time will tell.

Trying to grow things on the edge of a desert is a certainly a challenge. Growing only plants native to this area or to adjacent areas to the west makes the task easier. But trying to keep trees that have survived the drought of the 50s and everything since healthy is difficult because large native trees require a lot of water—water we may not have anymore.

We all love our trees and the thought of losing any of them is not pleasant. But this beautiful country once had fewer trees than it does now and it was beautiful back then as well.

Until next time...

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