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**RELEASE DATE: August 30, 2012**

**TREES AND DROUGHT**

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One of the things that separate plants from animals is that plants are stationary. If their environment becomes hostile, they have to stand and take it. An animal can move to a friendlier place but the trees have to endure or not whatever nature dishes out. As a result, trees have developed survival strategies that work well in their natural ecosystems. Our Aransas County live oaks bend with the wind. Mangroves can tolerate salty, brackish, or fresh water depending on species. Cypress lives in flooded swamps.

Because trees can’t move, their endemic insect populations number in the hundreds of species, both good and bad. Introduced, non-native trees will harbor a much smaller number of species. It is the non-native insects that are the pests that endanger the native trees. They seldom bring their enemies with them. Woolly worms, white marked tussock moth larva are the insect problem for live oaks in Aransas County. The myriad number of native insects only becomes a problem when humans upset the balance of nature by attempting to reduce the population of the invading species.

We love our live oaks, *Quercus virginiana,* the dominant tree of the Aransas County sand dune. These trees have been here a long time during which they have adapted to and developed strategies to survive the vicissitudes of this soil and climate. Natural changes in the environment usually occur slowly and gradually and the tree’s responses are likewise slow and gradual. When people enter the scene, the picture changes. We cause abrupt change to the tree’s environment but the tree can only respond with the slow and gradual strategies that worked so well through its thousands of years of history.

One of the ways live oaks survive drought is by dropping their older, less productive leaves. These are the leaves in the interior of the canopy. This reduces the tree’s need for soil moisture. But with fewer leaves to produce photosynthate (sugars to feed the roots), roots die from starvation. This process continues in an unseen feedback loop until the soil moisture level, canopy, and root system come into equilibrium. What we see is our tree is now covered with lichens because the canopy has opened up and let in enough light for them to thrive. The branches in the inner canopy die. The outer branch tips may have no leaves on them. We raked up a lot of leaves at the wrong time of year and the grass under the trees is the best it’s ever been. Our tree or trees are definitely stressed.

If we love our trees so much and they are so important to us we should at least take as good of care of them as we do our lawns which are ephemeral compared to the past and future life time of a tree.

Trees need a lot of water. They use it in photosynthesis, converting atmospheric carbon dioxide and sunlight into sugars, which are then converted into everything that the tree is: wood, leaves, roots, acorns, etc. Water is also the cooling medium for the tree as it is for people. Transpiration, the evaporation of water from the leaves does two things: it cools the leaves and it pulls water up the vascular system of the tree from the soil, high in water, to the atmosphere, low in water. The hotter and drier the air around the leaves becomes, the more water they demand from the soil. If they aren’t satisfied, the stomates close, the leaves heat up and die, then fall off. The tree ends up with an open canopy and bare twig tips around the outside of the tree.

If this water deficit situation continues long enough, the moisture level in the wood is reduced to the point that Hypoxylon canker fungi can thrive. As this endemic fungus starts to grow, it plugs up the vascular system of the tree, exasperating the water problem. Thus, a seemingly healthy tree can literally die with its leaves on in a matter of days or weeks.

What can be done to prevent or alleviate this dire situation? First, realize that for many trees human’s activities create a temporary, if not permanent drought, a restriction of moisture less than the tree requires for optimal growth and health. We have to compensate for what nature cannot provide. When nature compounds the problem with lack of rainfall, we as caretakers of our personal ecosystems must take over.

During manmade or nature induced water scarcity the following steps should be taken to provide valuable trees with adequate moisture:

1. Water the trees first, before the shrubs and lawn. A whole lawn can be replaced for the cost of removing a single large tree.
2. Apply water at and beyond the drip line of the canopy. This is where the feeder roots are located. The trunk does not absorb water.
3. Water every two weeks without significant rainfall (at least one-half inch). Set the hose at medium pressure. Let it run at least five minutes for each inch of trunk diameter. If several trees are in close proximity, add up each of their diameters and multiply by five minutes to get the length of time to water.
4. Water should soak in at least eight inches. You must apply enough water to get below the grass roots. Use a shovel and dig a hole the depth of the shovel blade at the edge of the canopy. The soil should be moist to the bottom of the hole.
5. Apply mulch, such as the mulch available from the Transfer Station, in a layer two to three inches deep starting one foot from the trunk and extending out as far as the drip line—if you have enough mulch material and energy to spread it. If you can’t spread it all the way to the drop line, go as far as you can—any amount is helpful to conserve soil moisture by reducing evaporation from the soil surface. It is very important to keep the mulch off the trunk.
6. This all needs to be done before water restrictions go into effect.

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