



Wichita County Tree News

May 2014

Extension Office * 600 Scott Ave, Suite 200* Wichita Falls, TX 76301* 940-716-8610



Tree Roots- Where Are They

The plant root system may be described as unseen and unappreciated. It is extremely difficult to study an entire root system because it produces a multitude of hair-like, non-woody roots (about 0.008 inches in diameter). Absorption of water and mineral nutrients is the function of these very fine, non-woody roots (the feeder roots). With continued growth, each root will lose its ability for absorption. These larger woody roots then function as the transport system for water and nutrients from the new feeder roots to the stem. They are also the tree's system of anchorage and a food storage area.

Because of the horizontal growth pattern of the tree root system, nearly 99 percent of a tree's root mass is usually located in the top soil. (*In Texas this is in the top 12-14 inches, due to shallow soils. Texas A&M Forest Service*).

When the soft feeder roots become woody, or if they are lost to insect feeding or other physical damage (*drought*), the absorption capacity is lost, and new feeder roots must be produced. This means that absorption is dependent on continued growth of new roots.

Roots only grow where the physical and chemical environment is correct – temperature, moisture, aeration, pH, nutrient supply, soil structure. Roots do not seek water; they grow where moisture is available. Roots also need oxygen and growth is restricted where oxygen is limited. The greatest proliferation of tree roots will be found in the transition zone at the soil surface, thoroughly intermingled with grass roots in a lawn. Because of this complex system, it can be two years or more before injury to roots will appear as dead branches or even death of the entire tree.

Originally published by Alan McDaniel
Department of Horticulture, Virginia Tech,
Blacksburg, VA 24061-0327
The Virginia Gardener Newsletter, Volume 6, Number 8.
Michigan State University Extension-Oakland County

Watering Tip

If you are able to water your trees or shrubs, use a long screwdriver to test soil moisture. If you can push it into the ground, you probably have adequate soil moisture for a few days. For a 3 minute video on this, from Texas Forest Service see:

www.youtube.com/watch?

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EFFECTS OF DROUGHT STRESS ON TREES AND LANDSCAPE PLANTS

Texas A&M Forest Service



During times of drought, trees and landscape plants often show the effects of the hot, dry weather. While green plants normally have a moisture content of 125% - 200% or more, during severe and prolonged drought, the moisture content of live, woody plants can drop below 100%.

Water deficits in trees have an adverse effect on many of the tree's growth processes. If the roots are unable to supply enough moisture and nutrients to the crown of the tree, the crown will usually begin to die back to bring the tree's crown and root system into a more favorable balance.

Plants breathe through a process called transpiration, whereby they release considerable amounts of water vapor through tiny leaf openings called stomata. Under normal conditions, transpiration is lowest during the hottest part of the day, greatest in the morning and late afternoon, and ceases at night. When soil water becomes limited, the plant will try to conserve water by closing the stomata in the leaves. But when the stomata are closed for extended periods of time, transpiration ceases and this causes photosynthesis to stop and the plant stops growing. If this goes on long enough, the plant will die. Plants try to protect themselves from water loss by closing stomata, slowing or stopping growth, and by prematurely dropping their leaves. It is common to see leaves falling from trees in mid-summer during dry years.

Soil type also impacts soil moisture. Soils with a high clay content will hold water much better than sandy soils. Trees growing in clay soils tend to be shallow rooted and may be more severely impacted by prolonged drought than trees growing on loamy or sandy soils where roots will grow deeper. Most of a tree's feeder roots that absorb moisture and nutrients are located in the upper 12-14 inches of the soil. When a clay soil dries out, the impact on the tree can be great since the tree is not "accustomed" to sending roots deep into the soil for moisture and nutrients.

TREATMENT STRATEGIES: WHAT YOU CAN DO

Most tree damage is due to a combination of factors including soil conditions, tree species, and weather patterns. It is unlikely that stress will be alleviated by simply altering a single factor. Rather, improvement will come from an accumulation of many moderate changes to relieve stress and increase vigor.

- ◆ Prevent soil compaction near trees. Clay soils are especially vulnerable.
- ◆ Reduce competing vegetation and **apply mulch to maintain soil moisture** (1-3 inches is usually sufficient).
- ◆ If possible, irrigate landscape trees during dry weather. **Apply water slowly** over many hours so it penetrates to tree roots or use drip irrigation lines.

(Use a long screwdriver to check soil moisture. If it won't penetrate the soil, it is too dry. Water to at least 12 inches deep. _ Texas Forest Service tip)

- ◆ If insect larvae or branch/stem cankers are evident, prune and destroy affected branches to reduce the spread of these agents.
- ◆ **Do not fertilize during drought conditions.** Fertilization stimulates foliage production and can increase a tree's water requirements.

Website: <http://oregon.gov/ODF/privateforests/fh.shtml>

TREE NEWS

From time to time, Wichita County AgriLife Extension will send educational material that addresses key issues at that time. It may include information on upcoming educational events that may be of interest. Your name is on our mailing list from a past AgriLife event. If you do not wish to receive information on this, we apologize. To have your name removed from our mailing list, simply send an email to our office secretary at Gina.Karbiner@ag.tamu.edu and your name will be removed. If you have other topics of interest that you would like to see addressed, please forward them to us.

Estimating Tree Water Needs

(David Graf, Extension Agent, Wichita County)

Determining water needs for any plant is at best a guess due to variance in soil type, soil depth, plant species, changes in wind and temperature... and on and on. But I feel it is very important we attempt to 'guesstimate' how much water we might need to help protect our trees, considering water hauling, rainwater (we hope), and well water of decent quality is available for some.

If we assume our NORMAL, AVERAGE rainfall of 28 inches per year has been adequate to keep our trees healthy and growing you might try this calculation to estimate water needs. I have a large, mature pecan tree that is 40 feet from one side of the canopy to the other. That is a 20 foot radius. To find square feet: Area = radius X radius X 3.14, so the square footage of this tree is: 20' X 20' X 3.14 = 1256 sq.ft.

A one inch rain yields .62 gallons of water per sq. ft. so a 1 inch rain would provide this many gallons to this tree: 1256 sq. ft. X .62 gallons = 778 gallons

If we multiply 778 gallons per 1 inch rain, times 28 inches per year, this tree theoretically has received about 21,804 gallons per year with NORMAL rain. If this tree has had access to lawn irrigation, that number goes up. By the way, tree roots need water in the winter as well as summer.

****Mature pecan trees may require over 2,000 gallons of water per week.**

Evaluating Pecan Problems October, 1995 by George Ray McEachern, Extension Horticulturist, Texas A&M University

****Gallons per week- Dwarf yaupon holly ½; Purple sage ½; Lantana 1; Crape myrtle 1 ½**

Plant Water Requirement Study, Keith Owens, professor of range ecology, Texas A&M University Ag Research Center in Uvalde



Mulch is Key

Beth Turlington, Wichita County M.G.

Mulching your trees is the most important step you can take to help them survive. It reduces evaporation, lowers soil temperature, and limits weed growth. It may also slow down water runoff and increase soil water uptake in a heavy rain event. Add a 3 inch layer of hardwood mulch out to the drip line of the tree, but do not pile mulch around the trunk. This aids insect access to the tree and in extremely wet conditions can increase the risk of fungi on trees.



What About the little Green Bags?

Beth Turlington, Wichita County M.G.

Treetrators work well on new and small trunked trees. They are easy to fill from a bucket or gallon size jug. Be sure you check the soil moisture of the root ball, as well as the soil around the ball.

Tree Borers

<http://ucipm.ucdavis.edu/QT/treeborerscard.html>

Numerous types of insects may bore into tree trunks and branches in their larval stages, producing sawdust or sap-filled holes and weakened trees. Most borers can successfully attack only trees that have been stressed by under- or over-irrigation, disease, lack of proper care, or injury by mechanical equipment. Usually by the time the tree is infested with borers, there is little you can do to manage them.

If borers are in your trees, identify them correctly. Confirmation of species requires finding the insect, although knowing symptoms and host plant species can help. Many tiny holes in tree trunks and branches may indicate **bark beetles**; larger open tunnels filled with sawdust-like frass indicate **clearwing moths**; **flatheaded or roundheaded borers** leave wet spots and dark stains and D-or 0-shaped emergence holes.



flat headed appletree

The flatheaded appletree borer, *Chrysobothris femorata*, is one of a complex of over 600 species in U.S. belonging to the family Buprestidae. The flatheaded borers, or metallic wood boring beetles, as a group, are perhaps the most serious pests attacking a wide range of tree species. The larval stage of the flatheaded borers is the most damaging to trees as they feed in the cambium layer just under the bark of the trunk and scaffold branches. They create galleries which may eventually completely girdle the tree under the bark. This type of feeding severs water- and nutrient-conducting vascular tissues and results in die-back of twigs and branches, and if severe enough, results in the death of the tree.

The following species serve as hosts for the flatheaded appletree borer: apple, basswood, beech, boxelder, cherry, maple, flowering crab apples, yellow poplar, oak, sycamore, hackberry, hickory, pear, peach, poplar, tuliptree, willow, rose, cotoneaster, hawthorns and serviceberry.

Nonchemical ways to manage tree borers:

Local infestations of bark beetles and other boring beetles on branches may be pruned out.

If the main trunk is extensively bored, remove the tree. Focus on protecting trees of the same species.

Clearwing moth larvae may be killed by probing tunnels with a stiff wire or with applications of beneficial nematodes in the genus *Steinernema*.

Insecticides: Seriously affected trees cannot be saved with insecticide treatments and should be removed. Insecticides must be applied to kill adults as they are laying eggs on trunks and branches of trees before they are seriously infested. Careful timing is essential for success. No insecticides are effective against larvae within trees, including systemic insecticides such as acephate or imidacloprid. If treatment is warranted, use persistent insecticides labeled for bark treatment such as carbaryl and certain pyrethroids. The most effective materials are available only to licensed applicators.

(some new chemicals may have been released since the writing of the article above. Borers attack stressed trees, so be aware. Treatment timing depends on the insect species, but in general it is not too late to treat for borers. David)

Helpful web sites with great drought information:

The Lady Bird Johnson Wildflower Center www.wildflower.org Click on the 'Native Plants' tab.

The Texas Forest Service <http://texasforests.tamu.edu> Click on 'Education Resources' on the left side.

The Texas A&M AgriLife Extension, Earthkind Landscaping <http://aggie-horticulture.tamu.edu/earthkind/drought/>