



Medicine for Stressed Trees: Radial Trenching

Important trees can be susceptible to a number of hazards to their health. There are hundreds of types of insects and almost as many diseases (fungal, bacterial, etc.) available from time to time. But what's wrong when either there's no trace of either of these or their minimal presence does not account for the sickly look and condition exhibited by the patient?

A classic and very common example of this shows up when a tree is struggling in a less than good soil environment. It may appear sparse in its leaf canopy and even beginning to die back at the tips of the branches. Yet there may not be clear evidence of debilitating insect problems such as scale or fungal root trouble such as gano-derma or phytoththera. In many cases like this the problem is the soil itself.

In the Mid-South we commonly live with a heavy clay soil. The characteristics of clay soil are its small pore size which tends to hold water and preclude good aeration. It also is prone to serious compaction, which can impede the growth and function of fibrous non-woody root systems that pick up water and nutrient from the soil. While this problem can occur anywhere, it is most common on new sites where the topsoil has been scraped away to permit drainage and new trees are

planted in a hard nutrient-deficient subsoil. At the same time older existing trees on the



A small struggling oak after radial trenching. Grass will grow over and hide trench lines.
Photo: Fred Morgan

site lose their historic topsoil and the roots that are growing in it during those same grading operations. Oaks are especially susceptible.

Lacking the ability to entirely change out the soil in such a case, the next best thing is a procedure called radial trenching. The photographs and diagram illustrate how this is done. Beginning at a point approximately ten to twelve (10'-12') feet from the trunk of a large tree, a trench is created approximately eighteen (18") inches deep and extending outward and directly away from the trunk and to a

trenches and the excavated soil will be pulverized to a far greater extent.

Depending on the size of the tree and the soil area to be modified, four to eight of these radial trenches can be created. Enough of this pulverized excavated dirt should be used to backfill the trench after being mixed in a 50-50 ratio with Pro-Mix or some high organic content planting soil equivalent. The trenches should be tamped moderately as the amended soil goes in and the leftover soil can be discarded or used elsewhere. In many cases a light sprinkling of Milorganite into the backfill will also be helpful.



At another site the sod has been temporarily removed for installation of this larger six inch wide and eighteen inch deep trench. Hand digging is an alternative where trencher access is problematic.

Photo: Fred Morgan

point a few feet beyond the ends of the branches, commonly called the "dripline." The radial direction of the trenches is crucial to minimizing the damage caused by root severance. Use of a trencher may be preferable to hand-digging since there will be less glazing of the soil along the walls of the

In a season or two the stressed roots of the subject tree will grow to and cluster at these loose aerated soil trenches like a child runs to ice cream and cake at a birthday party. While somewhat labor intensive, radial trenching is usually a one-time prescription and will get a struggling tree over the hump and perked back up.



From My Journal: Riding the Katy



Ever since I was a youngster in a very rural 1954 Cordova steam-heated wooden-floored fifth-grade schoolroom I have loved history. I remember being particularly fascinated with the story of Lewis and Clark's 1804-06 journey to the Pacific and back with the Corps of Discovery. I never took a poll and it may be my own naïvete but I still believe that I was enchanted with this epic tale even more so than any of my other classmates. In those young and callow years, living where we did, my brother and I would often roam the then-off-limits pastures and woods and ravines on the back side of the Shelby County Penal Farm all the way southward to the banks of the Wolf River. Now, fifty-plus years later, that is all public land known today as Shelby Farms. But there, in those days and in our fertile imaginations we became avid re-enactors, always "explorers"; maybe I was Lewis and Tom was Clark or visa-versa.

However that was, the excitement and mystic of it continues indelible in my memory and my spirit to this day. So when my wife came up with the idea of a Fourth of July trip

up to St. Charles, Missouri to undertake a three-day bicycle ride along a trail that followed not only the banks of the Missouri River but the actual track of the first days of that fa-

on the Missouri before coming back home the next morning. The city expected 100,000 attendees for their impressively patriotic program. It looked to me like every one of them decided to come.

The Katy Trail is a 220-mile-long linear state park that was once the roadbed of the Missouri, Kansas and Texas Railroad. The initials MKT soon became popularly known as "The Katy." After the railroad suspended almost one hundred years of service the roadbed and right-of-way was acquired



Fred Morgan in front of first night's B&B in St. Charles, Mo.
Photo Becky Morgan

mous expedition, I jumped at it. Our kids and grandkids were going to be out of town for the holiday anyway, so why not.

In a flush of mutual enthusiasm we purchased panniers (saddlebags) for our bikes, "googled" information about the trail, the history and B&Bs along the way and then set out like two kids on the way to



Checking equipment on the trail
Photo Becky Morgan

Corps of Discovery's first night camp site along the Missouri, up the river from St. Charles.
Photo Fred Morgan



the candy store. We left our car for three days in St. Charles, there at our first B&B which was just a hundred yards from the trail-head. Our plan was to return back there for our fourth and final night. That fourth night would include St. Charles' RiverFest Fourth of July fireworks program

by the State of Missouri, which transformed it into a mostly flat limestone pedestrian and bicycle trail. That trail today extends from St. Charles westward to Clinton through towns like Augusta, Booneville, Sedalia and others. Maybe because we had no one to move our car we went out only forty miles and back . . . eighty in total . . . saving those tantalizing remaining parts for subsequent trips. In the sections we *did* ride the trail is largely shaded by over-arching tree canopies that, in part, run along both the edge of the river and the base of high limestone cliffs. As long as you keep moving the descendants of the mosquitoes that Captains Lewis and Clark com-

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plained about in May of 1804 won't get you.

the story. Even the marker there put forward the intriguing question of the impact on history of such a potential mishap in that first week. On the

tion on the west end of what can be another linear park that might potentially



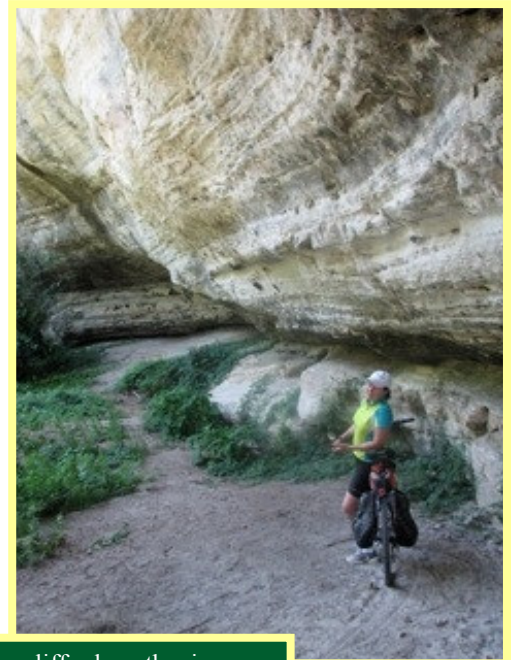
On an old bridge over a creek along the Missouri River.
Photo Becky Morgan

Along the way we visited breezy hilltop wineries and read historic markers in front of river scenes that decades before I could only *try* to imagine. One marker was located near the point where Captain Lewis nearly fell to his death in the first few days while climbing back down from his exploration of a cave up in the face of the cliffs. He barely saved himself by stabbing his knife into the steep shaly surface and so their journals immortalize

smooth surface of the pond of history, the ripples of such a pebble would have undoubtedly been unending.

And of course there are many other places to visit and stories to be told but for an easy and easy-to-get-to long weekend jaunt into history that is also scenic and fun, the Katy ride will be a memorable one for us. We surely plan to go back.

Many of the folks I have talked to about our trip have already heard of the Katy. I am convinced that is true because it is such a special and unique asset to the region and to the towns along its track. For that same reason it is also encouraging to me that Memphis is at long last also moving in a similar direc-



The high limestone cliffs along the river are full of caves, from one of which Merriwether Lewis almost died while descending.
Photo Fred Morgan

and eventually extend eastward far beyond Shelby Farms. Although different, there is history here too. We should make it available to ourselves and our children through a venue that is educational and scenic and fun.

Did You Know . . .



. . . that for many plants the symptoms of water deprivation and the symptoms of opposite over-watering can be similar. Yet in the summertime, when a tree's leaves begin to wilt or roll up, there's a strong inclination to just assume that lack of water is the problem. That may be the case, but it is also worth considering the soil, topography, and irrigation schedules on site (i.e., frequency and duration).

Clay soils have small pores that can be easily filled with moisture, driving out oxygen and ultimately causing roots to become dysfunctional. Also, while clay soils hold to water tightly, it takes some time for water to move in the soil. Therefore, frequent shallow (read "short") waterings of fifteen to twenty minutes may wet only the top inch or so. But if it's also fifteen minutes every day, the net effect is a kind of vapor barrier that prevents gas exchange and aeration of the soil pores. This pattern can seriously stress tree roots.

Annuals and shallow rooted plants in prepared beds may thrive on this water regimen but trees do not like it and will shortly tell you so. Mature trees should be supplementally watered once a week for several hours. The application should be done slowly, as with a soaker hose pattern, in order to let the water soak in and minimize runoff. And trees like their water inside of and just beyond the ends of the limbs (the "dripline"), NOT immediately around the trunk.

. . . that a black sooty residue on the twigs and branches of many trees, including maples and oaks, can be a tip-off that a scale infestation is getting out of hand.



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Watch Out For Root Rot!

As you might imagine, I get regular calls from folks who are concerned about the health of their important trees. One may report that they have seen a strange formation at the base of their tree that they believe just doesn't belong there. They are afraid that it may be harmful. Now and again their descriptions will go something like this: "Yes, it's a large brown to black and hard horseshoe shaped thing that is growing right on the tree at the bottom. It almost looks extraterrestrial, almost "spooky!"

As likely as not that is a layman's description of the reproductive above-ground parts of a soil-borne fungal rot called Ganoderma. It can sometimes be tan to orangy in color and the growth they report can range in size from a few inches to eighteen (18") inches across. This rot disease can infect many species of woody stem plants. However it is most commonly seen in the Mid-South around the bottom of mature large oaks that are in a frequently wet environment and whose base is shielded from sunlight and air flow by excess mulch, multiple seasons of rotting leaf accumulations and/or old and thickly surrounding ornamentals. These situations not only encourage the presence of Ganoderma but also frequently hide it from discovery until its damage is advanced.

Interestingly, this pathogenic fungus is also known to have beneficial properties for medicine and pharmacology. But for those of us who value our mature trees it is primarily a sign of serious and persistent trouble. The appearance fruiting bodies like these is a sure indicator that some root damage has occurred and/or is occurring to nearby buttress roots, those large diameter roots that support the entire tree. The question then becomes how many roots are impacted and to what extent. Root damage on the windward side (northwest to southwest) of large trees can be serious when people, houses or other property are located on the opposite side. The disease frequently does its damage from the bottom up, hollowing out a large support root from below while the above ground part still looks normal. Once established, Ganoderma is nearly impossible to eradicate and the best response is control and suppression through good cultural practices.

Another universal species of root rot that occurs locally is Armillaria mellea. Symptoms of this disease can be reduced growth and a slow decline characterized by yellowing leaves and twig and branch dieback. Another sign can be the appearance in the fall of tannish brown to cream colored toadstools around the base of an infected tree. Yet in some cases trees infected with Armil-

laria will exhibit few of these symptoms before falling over due to

root compromise. Armillaria is also characterized by white fungal "mats" under usually loose bark. These mats are seen with black shoestring-like rhizomorphs that carry nutrient to the white disease fungus and travel back to nearby rotted stumps, infected rotting leaf piles or to the soil itself.

Sadly, the innocent but contributory actions of the owner encourage this problem or make the situation worse. Avoid soil level grade changes near important trees. Do not plant thick growing ornamentals close around important trees. Supplementally water long and slow but only once a week during dry periods. Make periodic inspections, especially around on the backside of important large trees. And if you see evidence of Ganoderma or Armillaria that may affect a significant part of the basal circumference, consult with a certified arborist.

In almost all cases the key to prevention and remediation is a little knowledge and vigilance. And if a few changes are needed, sooner is better than later.

