
DETECTIVE DENDRO

THE DIAGNOSTIC SLEUTH

By Guy Meilleur



The Case of the Torched Tips

After viewing the International Tree Climbing Championship in Tampa, Florida, U.S., Codit and I were getting ready for the beach. He slathered on the sunscreen as I replaced the field test materials in our diagnostic kit. “We’ve been testing a lot lately; I’m glad these replacement chemicals arrived before we check out today’s southern live oak (*Quercus virginiana*). We never know when we might want to identify *Phytophthora* in real time, without submitting samples to a lab. Speaking of chemicals, do you know what’s in that stuff that your skin is absorbing as we speak?”

Codit turned the bottle around and tried to read from the label. “Oxybenzone can be toxic to reproductive systems or interfere with normal development. 4-methylbenzidyl camphor is also a hormone disruptor.” He snapped the cap shut and put the bottle on the shelf.

As we walked to the truck, I caught Codit up on the case. “The client has owned the property for three years. The landscapers say they use organic practices, and edge

the flowerbeds by trenching.” Codit winced as he turned the key and put the truck in gear. “A fiberoptic line was bored under the tree two years ago. Two large lower limbs have been removed to gain extra clearance to palms by the front door and the street. Removal of lower and interior growth was sold as “storm-proofing” the tree. The cuts were made at the collars. No branches were reduced. Another tree service saw a shiny mushroom on the trunk and recommended removal.”

Codit stopped at a red light, looked at the screen on the tablet, and observed, “So the tree is basically lion-tailed, huh? Collar cuts are not proper when they take off too much. Sure is a pretty lawn, huh?”

“Yup, that turf is pristine green St. Augustine,” I noted as we turned into a nice green neighborhood and parked under the live oak canopy at the curb. “And here it is. They do a good job on the weeds during their monthly visits. And you’re right about the overpruning; the wounds are too big, and the dose was too high for a tree that old. The owner realizes that, so she’s asking us to inspect the tree’s condition and list management options.”

The client met us at the tree. “Detective Dendro, I’m so glad you could make it over to help my tree today. Since I sent the pictures, the tree has sent out two- to three-foot (70 to 98 cm) sprouts from the pruning cuts.”

“Yes, the tree is starving, and that’s the quickest way for it to make food.” I aimed my binoculars upwards. “The top branches of the tree are sparsely foliated, and some tips have newly-killed, bright brown leaves reflecting the sunlight. A lot of that Spanish moss (*Tillandsia* sp.) is shading out lower foliage. The tree is slow to scar over that big pruning wound.” I pointed my laser to the measly margin of new tissue. “By climbing, Codit can send bird’s-eye images of the major forks down to us; collect samples of those dead tips; inspect associates, like lichens and insects; and inspect limbs for signs of response growth, cracking, or decay, and a good route for a lightning protection system.”



The brown branch tips are cause for concern for the detecting duo.

“Got it, boss!” Snapping the tool bag to his saddle, Codit nodded, and ascended.

I walked over to the trunk and bagged samples from the shiny fungal conk and decomposed wood. Six inches (15 cm) of fill soil, and some small circling roots, came out before I got to the bottom of the infection, at the root crown.

“It doesn’t sound hollow, and live oak wood is known to be resistant to colonization by this *Ganoderma applanatum*,” I told her, “so there’s still support down here. There’s no reason to remove this tree. We could get more information with a microdrill, which I could arrange.” I looked up to Codit clipping twigs and reminded him, “Be sure to cut below the dead parts, so we can inspect the transition zone.”

My assistant gave the thumbs-up. I made a few changes to the preprinted protocol on standard flare care and handed it to the client. “Orient sprinkler heads away from trunk. Remove soil—like I did here—all around the stem. Examine buttress roots. Cover the root collar, where the roots separate, with expanded aggregate for aeration—and perhaps encourage adventitious rooting. Under the branches, apply compost and aggregate in specified holes. Apply mulch made from leaves and twigs of healthy live oaks. Leave the trunk clear. Allow the infection to dry.

“No more green leaves should be removed until the top of the tree is greener, and wounds have more callus growth. After that, some of the lower sprouts can be selected to become branches. Excess moss should be removed, to get more sunlight to the leaves. Codit and some local associates may offer that service.”

Codit had slid down silently and now stood right behind us. “I pulled some of it out just now. The growth up there is very fragile. It’ll be hardened by August, when we’re back in Florida for the ISA conference. We could clean the crown then.”



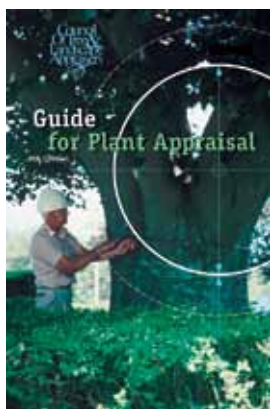
Torched tips are scattered throughout the crown, in a seemingly random pattern.

“Go ahead with crown cleaning, flare care, and microdrilling.” The client nodded, “But I am still concerned about these dead tips scattered throughout the crown. What do you suppose is the cause?”

“That’s a very good question,” I answered. “It’s possible that the tree “shed” this growth late last growing season because the energy needed to keep it alive exceeded the energy gained. There could also be a hydraulic deficiency as a result of root loss, or twig girdling insects cutting off circulation, though I see no signs of girdling with my hand lens. Please check on past landscaping records, and the location of irrigation lines. We’ll take these samples to the local extension office on our way to lunch.”

Will Dendro get to the bottom of this mystery of the torched tips? Turn to page 68.

Guide for Plant Appraisal, 9th Edition



Authored by the Council of Tree and Landscape Appraisers, Guide for Plant Appraisal, 9th Edition is the professional plant appraiser’s how-to manual for determining size, species, condition, and location factors that influence the value of plants. Not only is it an invaluable source for establishing the evaluation of plant casualties, but the book is also a reference for real estate transactions, insurance purposes, plant condemnation actions, and tree inventories.

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WHAT'S THE SOLUTION?

Lunch was delightful. The extension horticulturist helped us rule out twig girdling insects, and doubted the shedding and hydraulic hypotheses. When we got back to the job, the client confirmed our guess that the irrigation lines were not the problem, but she was still looking for landscaping records, so we went to work.

Codit used his hand pruners to demoss some declining branches, while I got the dirty end of the stick, shoveling away the fill. Reinforcing ribs rippled up and down the trunk. I pruned four girdling roots near the original grade, cleaned the trunk with phosphorous acid, and backfilled with expanded aggregate.

I sat down on the porch steps and watched Codit bag up the moss, for friends up north, and load the gear. Just then the client came out with papers in her hand. "Here are those bills showing what was applied in my yard."

I didn't recognize the name of the product used, so I searched on my phone as Codit looked on. "MSDS, what's that?" he asked.

"A material safety data sheet (MSDS) provides procedures for handling or working with that substance in a safe manner, and information from toxicity to PPE. MSDS formats vary with regional requirements, but the directions are typically found on the label.

"The active ingredient is metsulfuron-methyl, MSM. 'Injury to or loss of desirable trees or other plants may result from failure to observe the following: Do not apply ... Herbicide (except as recommended) on or near desirable trees or other plants, or on areas where their roots may extend. Avoid spray drift onto nontarget susceptible plants...' These landscapers should know that using these products around this tree is contrary to the label, and may violate federal regulations.

"It might be wise to let the root sprouts grow for a while, but we understand they might contrast with your

landscape goals. The next best approach might be to clip them as low as possible, spread expanded aggregate, then cardboard, then hardwood mulch. Lawn treatments must avoid the biggest broadleaf 'weed' around, this live oak tree."

The client shook her head. "Just as applicators must read the labels on pesticides they use, from now on I'll read the information on the bill, and make sure my tree is not poisoned any more. What can we do about it now?"

I studied the dead twig in my hand. "Codit, please try to contact the Florida extension pathologist. I have a feeling he's familiar with this problem. Ma'am, the landscape company may have misled you, but as you say 'Buyer Beware' is only prudent. We could send samples to a lab to find out how much of this poison is in the plant, and in the soil. If levels are high, inoculating the soil with activated charcoal can draw some of it out, but the testing and treatments are costly."

Codit switched to speaker on his phone. "Hi, this is Jay Filios, state pathologist." The voice was loud and clear. "We get dozens of reports of branch and tree death every spring as a result of this herbicide. In field tests we have confirmed this chemical is toxic to trees, but the chemical industry denies responsibility. The chemical can stay active in the soil for over a year. It's hard to prove with absolute certainty, but the circumstantial evidence is overwhelming."

"Thanks Jay, that's very helpful," I replied. "We'll send samples and details of this case to your office, for your information. We'll also check the state website about landscaping practices in general. The environmental cost of these pretty green lawns must be significant, not just directly to trees, but also the groundwater that lies just beneath this sandy soil."

I later saw an article on MSM in an ISA Texas Chapter newsletter. The author reported "generalized dieback in crapemyrtle (*Lagerstroemia* sp.), but on live oak, it was always localized branch death. Parts of the crowns look great, while adjacent branches suddenly brown and die. Those cases occurred in soil with a higher clay content, and involved applications made in September. When uptake is slow, MSM may accumulate in the phloem, thereby killing specific leaders or branches."

We returned in August on our way to the ISA conference. Codit and his friends prepared to demoss more branches and remove all the dead tips from specified sections of the crown. I met the client at the flare with my highlighter in hand. "The state lab found *Phomopsis* sp. on the dead leaves," I said. "But it's probably a scavenger, not a pathogen. After the crown cleaning, you will be able to see whether there is any future tip dieback. Specified soil modification should help vitality, and buffer any residual chemical activity in the soil. I see that the lawn is managed differently. It may not be as pristine as it was, but the tree will thank you for it! The mulch where roots were sprouting was very well done."

"Thank you, Detective—it feels good to do the right thing by my beautiful tree. I hope you can visit us once a year, to make sure it stays on the path to good health."



Root sprouts abound, presenting a challenge. A rib of reaction wood extends from the cavity concealed by the staghorn fern, *Platyserium* sp., and rocks cover the slope left after exposing the root collar.

“I’ll do my best,” I promised. “Since fungal spores are present throughout the air, soil, and water that surrounds the tree, it is the arborist’s first and constant task to make trees more resilient, to help them resist any attack. Please send pictures any time you have a question about what you see in your tree. I’ll be happy to observe this tree’s progress, and see it grow as an asset over time.”

As she went back inside, Codit gave me his summary. “I have two more acronyms to remember: MSM is an herbicide to watch out for, and an MSDS has vital information. Whether it’s sunscreen or pesticides, it’s key to read the label before applying chemicals, and use them only when needed.”

“You got that right—up you go, laddie!” I stepped back and reexamined the site. “We may never know how the tips got torched, but with regular monitoring, who knows what the tree will tell us?”



Guy Meilleur is an ISA Board Certified Master Arborist with historictreecare.com. This is his 31st episode in this series. Photography courtesy of the author. Thanks to Gregory David and Jason Smith for the contributions.



After crown cleaning, the leaves get more sunlight, increasing vitality, and hope for restoration.