

# DETECTIVE DENDRO THE DIAGNOSTIC SLEUTH

By Guy Meilleur



## The Case of the Stubborn Streaks

*The chase goes on, across the years and around the globe. As soon as I get a glimpse or a grasp it streaks ahead, to a new vision of a new version of truth about trees. I tossed and turned and strained to rediscover it; a stubborn streak of stamina sustaining my quest.*

The phone on the bedside table woke me gently, playing the tune programmed for my favorite urban forester, Ashley Greene.

“Hey Ashley, what’s up?” I got up and stretched as I looked at her cheerful face on the telephone screen, too long unseen in the flesh.

“Not much, Dendro,” her voice sang out. “Working for the city has its ups and downs, and its curious reports. We’ve been getting a lot of calls lately about streaks of paint on our street trees, black and brown and orange. It’s probably a seasonal prank, kids spray-painting Halloween colors for kicks. Our public works and police departments are on it, and I’m researching solutions for scrubbing the streaks off without poisoning the earth.”

“Maybe they’re Thanksgiving colors.” I regretted the lame joke as soon as it came out. “At any rate, I’m ready to see the big city, so I’d like to check them out with you, no charge. Lunch tomorrow? Codit can join us after his morning class.”

“Absolutely,” she agreed. “Let’s make it Joe’s Place at 11.”

The next morning was radiant as I drove into the city. The streets were lined with a blend of tree species, not long rows of the same cultivar. The invisible hand of a sustainable plan showed in their intermixture, at once resistant to epidemic and aesthetically refreshing. As I pulled into the parking lot and found a parking spot, I saw her standing there at the door. She smiled to see me, but her brow was knit with tension.

“Now we’re getting reports of trees with those streaks also having health issues,” she said. “There’s one with dieback right around the corner from here.” We sat down and ordered pasta with onions and walnuts. “Tree food is so good... will walnuts cost the same as pine nuts when that ‘thousand cankers disease’ hits the orchards?” she wondered.

“Maybe more,” I shook my head. “But I read in *Arborist News* that field arborists are working with researchers, so there is hope. I do believe I’ll stock up on walnuts though, just in case.”



**Halloween coloration causes confusion. Purple arrow points to old branch stub. Brown arrow points to shriveled sprouts. Green arrow points farther out on the collar of that node, to a dormant bud releasing. Accessory buds formed in branch collars are part of the tree’s survival system.**

I paid the bill, bought a sack of nuts at the store next door, and tossed my gear into her pickup. “Wow, they’re even making hybrid trucks now!” I said, enjoying the quiet ride. “What’ll they think of... Eww, look at the streaks on that southern red oak, *Quercus falcata*—is that the tree?”

“Yup, and there’s Codit, with a bucket and a brush,” Ashley answered, as she steered to a stop by the tree. “Hey Codit, I got the right stuff for removing paint.”

“Ready to go, Ashley. Those kids sure did use some nasty paint, and they put it on with a tool that damaged the trunks.” He pointed to an ugly streak. “Look at this, Dendro—never seen this kind of damage before.”

“Not from paint, partner.” I shook my head as I dropped my bag of diagnostic gear next to the trunk. “Let’s set down that bucket and brush and take a closer look.” Codit moved aside larger tools in my gear bag while hunting a hand lens.

“Still using that blowtorch to melt the ends of your ropes, huh Dendro?” he asked as he unfolded the lens. “In safety class this morning they told us to avoid breathing the fumes.”

“That’s not all he’ll need it for, and you’ll also need that knife in there, and a couple of bags,” Ashley said grimly, pulling out her phone. “We’ll call in Arbor Cop on this job: he’s a CPA. We also may need to get the crew to bring their chipper truck. For now, please bring us a bag of shredded mulch from the back of my truck. Dendro will work on the black streaks, and I’ll work on the others.”

“Knife and bags—oh, you guys must have leftovers from lunch to share—that’s great, I’m starving!” Codit’s eyes crossed as he tried

to look at us both at the same time, grabbing his belly. Ashley and I shook our heads. “You guys are messing with my mind! What else do we need fire for, or a knife and bags, or a bag of shredded mulch, and why does the city need a Certified Public Accountant? I knew Arbor Cop was good at math, but not bookkeeping; maybe I can get him to help me with my taxes... and this tree does not need pruning—why will we need the chipper crew? And why are you guys picking colors—isn’t all paint treated the same?”

“Here you go.” Ashley handed him a big apple and a handful of walnuts. “Enjoy this snack while you chew your questions over, and answers will arrive.”

*Will tree food give Codit the brainpower to understand tree work?  
Turn to page 68.*





## WHAT'S THE SOLUTION?

Arbor Cop pulled up just as Codit was finishing his snack. “Hey Ashley, I hear you need a CPA. I have my license and my CEUs are current, so I’m still a Certified Pesticide Applicator. Have you identified the pest yet?”

“This tree has more than one stubborn pest problem. I collected what looks like frass that came out of an insect’s... backside,” she said, passing a bag to A.C. “I’ve tried to dig out the invaders that broke through the bark,

but their holes take sharp turns so I have not been able to stab one yet. Codit, how about bringing that garden hose over here—maybe we can flush them out.”

“Well, all right,” Codit grumbled, dragging the hose behind him. “Now I know what the knife and bags were for, and I’ll get other help with my taxes. So Dendro, why do you get the small black streaks—are you specializing in small insects?”

“**Not quite**, I’m studying infectious diseases, and these black bleeding lesions indicate fungal or bacterial activity,” I replied. “Lesions typically break out after root damage, but now they are showing up on the trunks of undamaged beech and oak and other trees, sometimes 50 ft (16 m) above

the ground! They’ve never tested positive for *Phytophthora ramorum*, but these symptoms resemble ‘sudden oak death’. In Europe, the bacterium *Pseudomonas syringae* is present in similar bleeding cankers on horse-chestnut, *Aesculus hippocastanum*. Injecting those trees with garlic extract has shown some success.”

“Well, that makes sense. After all, garlic necklaces can prevent bleeding from vampire bites!” Ashley added. Codit held his nose. “My experience is with infestations, and those streaks are big and wet because an insect drilled through vascular tissue and sap is flowing out. Frass stains it brown and orange—feel the sharp bits of freshly cut bark and wood,” she said as she smeared some between her fingers. Codit hesitated, then did the same. “Some of that discoloration at the bottom of the streaks may also be due to fungi growing in the fluid that has been out for a while. Whatever the pest, the procedure is the same.”

“First, we excavate all dead and loose tissue, to expose the extent of the damage,” I began. “As you can see, we spread the mulch under the work zone, to buffer any pathogens before they can enter the soil and roots. If there’s a lot we use a tarp. After examining, we probe hidden areas, and decide whether the benefit of discovery will be worth the cost of excising live tissue. It looks like Ashley is holding off on excising for now, but I’ve cut into the margins to collect the sample; that’s standard diagnostic technique for infections. Next, we expedite our excavation with water, and extract anything interesting that is newly exposed.”

“**Now it’s PPE time!**” Ashley exclaimed, pushing her platinum waves into her helmet and fitting her goggles over her sky-blue eyes. She aimed and squeezed the nozzle; first soft, then hard. The jet of water pulsed through the wounds and streamed down the stem, soaking into the mulch below. With needle and tweezers she extracted odd bits from the holes, but nothing exciting. “No damaging insects to identify, A.C. What’s our next step?” she asked.

“All ready,” Codit answered, waving a hammer in one hand and revving a drill in the other. “Time to check for decay and assess tree risk. Checking stem strength is Step 1 in risk assessment, right A.C.?”

Arbor Cop grimaced. “Ashley, maybe I can use the frass and pictures of the damage to narrow down the identity of the pest. Codit, let me see the drill, please—but first



At the flare, crevices between buttresses are often prone to attack by insects and disease. Red arrows point to coarse frass falling from above, orange arrows to finer frass. Ants benefit trees by aerating soil and by carrying away dead material.

lock the trigger.” He grabbed the handle carefully, ran his fingers along the 1/8-inch (3.2 mm) bit, then set it aside. “This tree has sustained enough drilling already, by insects. You can tap the trunk if you want to, but all these surface wounds appear fresh, and there are no signs of deep decay. Besides, stem breakage accounts for less than 10 percent of tree failures, so risk assessment naturally focuses more on the roots and the branch unions, where most failures occur.”

“Exactly,” I agreed. “But this inspection is for health, and it is over. These lesions may be caused by a species of *Phytophthora* or some other soil-borne agent. They are typically hard to identify, but I have collected tissue from the margins to send to the lab. We could use this torch on the lesions in an effort to cauterize the infections. This method has proven successful on infected trunks of walnut trees, which are also in the Order Fagales, along with oaks and beeches, and this disease is hard to get out by other treatments once it has set in. For the insect damage, these holes are now clear for monitoring, and for possible chemical treatment.”

“Right,” Ashley nodded. “I’ll decide on management options when the lab results are in, and I’ll determine how much of our tree population is affected. For now, basic arboriculture is the best treatment, and that starts with mulching the entire root system that is not paved. Over here, guys,” she waved to the pruning crew as they drove in, backed up, and dumped a load of woodchips next to the tree. “These are pretty coarse; checked your chipper blades lately, guys? After the loader distributes it, let’s

spread them about six inches (15 cm) deep, but not against the trunk.”

“Well, that answers all my questions, except I thought wood chips had to be composted first or else they would be bad for the roots.” Codit scratched his head.

“Ideally perhaps, but our city budget is far from ideal. Research and experience tells us that fresh chips do no harm,” Arbor Cop answered. “So Codit, what did you learn about streaks today?”

“Streaks can be stubborn. The 5X plan is: Excavate, Expose, Examine, Excise, and Extract. A hole within the streak suggests insect infestation, no hole suggests disease infection. Damage living tissue only if justified, such as cutting out margins for disinfection or analysis. Lesions can be treated with trunk drenches, injections, and/or cauterization. For risk, look first to the flare and the forks. Improving tree health is a universal treatment.” Codit turned to Ashley, “How’d I do?”

“Excellent!” she exclaimed. “You’ve earned a pizza dinner, with any topping that you choose.”

“I never choose to do any topping... oh, you mean on the pizza.” Codit stroked his chin. “No mushrooms—we’ve seen enough fungi for one day—but extra garlic, please. We don’t want to catch any diseases.”

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*Photos courtesy of the author.*

## **SRC News (continued from page 67)**

during consulting, through service-learning projects (where practitioners and faculty work together to provide real-life experience for students and get things done at the same time), and even chance discussions at professional meetings. Generating more than just research ideas, partnerships make significant progress possible. For example, a partnership of the state forest service, an ISA chapter, and with university researchers greatly improves effectiveness on all fronts—information dissemination, solving specific urban forestry and arboriculture problems, addressing specific crises (such as emerald ash borer), continuing education, educating and galvanizing volunteer groups, and keeping research questions focused and efficient.

We can’t talk about partnerships without mentioning the TREE Fund ([www.TreeFund.org](http://www.TreeFund.org)). In the competitive world of government-funded research, the TREE Fund makes arboriculture research possible. The enthusiasm of the Tours des Trees bicycle riders, our ISA chapters, and the dedicated leadership of so many ISA members make this possible. As past recipients of Hyland Johns and Duling grants from the TREE Fund, we are very appreciative of this support and treasure the camaraderie of the arboriculture and urban forestry community.

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