



DETECTIVE DENDRO THE DIAGNOSTIC SLEUTH

By James Komen and Thea Komen

The Case of the Decaffeinated Morning

Codit blearily trudged into my office the morning after we returned from our travels abroad. Eyes half open, he was clearly jet-lagged and in need of a few more winks of sleep.

"Hey, Dendro," he inquired. "I think the coffee maker is broken. I can't get it to turn on."

I got up to check. I knew that if Codit didn't get some coffee this morning, he would have a rough day. En route to the office kitchen, my cell phone rang. It was insurance adjuster Dean Johnson with a new assignment. As always, he was in a hurry to get his claim processed.

"Good morning, Detective," began Dean. "For this assignment, I need you to determine why a tree failed. If there was a pre-existing condition, I need you to also determine if the property owner should have known about it prior to failure. The emergency tree removal company has already dismantled the tree and taken it off the roof, but I told them to hold their work until you could have a chance to view the site."



The trunk of the failed tree with a pile of branches next to it.

"Thanks, Dean. Do you have any photos for me to look at?" I asked while I fiddled with the blank display on the coffee maker.

"I didn't get a chance to go to the site today," Dean replied, "and I don't have anything on file. Since we're in a bit of a rush to get this all cleaned up, do you think you could stop by today?"

"Of course, Dean. We're on it!" I said.

I looked up to see Codit peering over my shoulder. "Did you figure it out?"

"Yeah," I chuckled. "It's unplugged."

He gave me a look that said, *It's going to be one of those mornings.*

"Let's hop in the car, and I'll get you some drive-thru coffee," I offered.

When we pulled up in the front yard, it was plain that there was a sizable chunk taken out of the roof of the house. A large temporary tarp was affixed over the hole. Codit and I gathered our data collection tools and headed towards the back yard. Codit was a little slower this morning, but he was careful to ensure he was wearing the appropriate personal protective equipment (PPE) before approaching the tree.

The rear yard dropped off down a steep slope away from the house, populated by trees of a variety of sizes. A patio deck extended out in cantilever away from the house over the precipice. I saw on the other side of the yard the remains of the root crown of the tree that had failed. The trunk had snapped off about six feet (1.8 m) above grade. Some of the branches were stacked near the base, and it was evident that the tree removal crew had taken a large amount of material offsite already. I could see that there were some branches with fresh needles in the pile, but most of it must have been cleaned up already. I snapped some photos of the scene.

Codit picked up a few pieces of the stacked wood and squinted at them. "I see some entry and exit holes in

these branches. It looks like there may have been some bark beetles present in the tree.”

“That may be an indicator of stress,” I explained. “Most bark borers are secondary pests that become established in already stressed trees. The damage they cause tends to be near the surface, leaving the interior heartwood intact in most cases, so their presence does not necessarily tell us why the tree failed.”

Codit nodded and started climbing down the slope to take a look at the area where part of the tree had landed.

I turned to the root crown. The bark texture indicated the tree was an Aleppo Pine (*Pinus halepensis*). I got up closer and saw a number of boreholes in the trunk, too. This tree was being eaten up. I wondered what the canopy had looked like before it was all cleared away by the tree removal company. Perhaps there had been some decline in the foliage that would have indicated a problem? Even then, just because borers are present doesn't mean that the tree is likely to fail in the short term, let alone that a layperson should have known about the imminent failure.

I went over to my bag and pulled out a mallet. A sounding mallet is a good diagnostic tool for detecting decay in the upper three to five inches (7.5 to 12.5 cm) of the surface of the bark. If the wood sounded hollow, then maybe there was some pre-existing decay below the surface.

I heard some rustling of the bushes coming from down the slope. Codit was still carefully making his way downhill, just out of view from where I was standing.

Mallet in hand, I walked up to the trunk and struck it. *THUD*. A dull, surficial, hollow sound. I struck the tree again in a different place. Another dull *THUD*.

Just then, Codit called up to me. He had found a 20-foot (6-meter) length of the trunk towards the bottom of the slope. It had traveled quite a way, steamrolling some understory bushes as it fell. Thankfully nothing else had been caught in its path.

“Wow, Detective!” he exclaimed. “This must have been a catastrophic failure! All of the bark got knocked off the trunk when it fell!”



The tree was growing on a steep slope.

I took one look over the edge, down to where he was standing, and saw what he was pointing to. I immediately put my hand over my face. Oh, Codit. So close, yet so far.

What did Codit miss? Turn to page 54 to find out!



...Where Arborists Tie-In

TreeBuzz

WHAT'S THE SOLUTION?

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"No bark?" I called down to him. "That's a dead tree."

Even from 60 feet (18 m) away, I could see that there were galleries of bark borers all the way around the section, with spots of white, fungal fans. There wasn't a spot of living tissue on that trunk. That Codit! I decided to save his admonishment for later; he was doing his best on only a few hours of sleep.

Clearly embarrassed, he replied sheepishly, "I'm just going to...I'm going to just take some photos and head back up."

This was a single trunk tree. There was no remaining conductive tissue over which to transport water and nutrients to the canopy. I began to suspect that the cleanup crew didn't actually clean up any foliage. There couldn't have been any to begin with!



A large section of the trunk rolled down the hill. It had no bark, and there were galleries from a history of bark borers.

I returned to the pile of brush. The branches with fresh green needles must have come from a neighboring tree. I looked up and realized that I had missed a 4-inch (10-cm) tearout on a neighboring healthy Aleppo Pine in the path of the failure. It appeared that when the dead pine failed, it took a branch of a neighboring tree with it. That explained the green foliage in the pile. Same species, different tree.

Back at the trunk, I pried off a piece of bark where I had tested with my mallet earlier. Underneath, the bark had separated from the heartwood; it just hadn't sloughed off yet. I probed the heartwood with my screwdriver. It went about three inches (7.5 cm) into a soft, discolored outer layer of xylem tissue. There were many things wrong with this tree!

At this point, the cause of the tree's failure seemed obvious to me. The structural integrity of the trunk had been severely compromised by decay. The recent wind event was just the final nail in the tree's proverbial coffin. The tree had been dead for so long that I wasn't even clear as to why it had died in the first place. Perhaps the drought?

But as to the second question for Dean: should a layperson have known of the pre-existing defect?

Codit appeared again, huffing and puffing up the slope. "Phew! How long do you think this tree's been dead, Detective?"

"There were no needles on this tree, including dead ones," I pointed out. "Dead needles don't usually persist for longer than one year following the death of an Aleppo Pine because of the annual wind events we have around here. All of the branches were dry and brittle, and the bark was barely hanging on. Not to mention the ring of decay around the entire circumference of the trunk! This tree was likely dead for a number of years."

Codit finished my thought. "Right. And even a layperson should have known that a dead tree was a problem."

He saw me give him a look and he protested. "I would have gotten it!"

We took some final photos and measurements for the report and then put away our tools. Codit swung himself into the passenger's seat and stuffed his jacket behind his head as a pillow.

As we drove, I summarized. "It's a fair conclusion that a dead pine tree near a residential structure, devoid of needles for more than one year, and with a trunk riddled with boreholes is a pre-existing condition that even a layperson should have been able to identify. But I think the real lesson for today is to come to work well-rested and



The bark on the lower portion of the trunk was barely attached. Pulling off a section of the bark revealed substantial decay and soft heartwood.

ready to make observations. We don't want to miss anything obvious."

When Codit didn't respond, I looked over. He was fast asleep.

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