

A tree checkup from the trunk up

Silver Spring man develops special X-ray device for noninvasive examinations

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by Meredith Hooker
Staff Writer

Tony Mucciardi walked around a towering tulip poplar in his Silver Spring yard recently, scanning its insides with a handheld machine attached to a computer, measuring the density inside the tree the way a doctor might use an X-ray machine to examine a patient.

The prognosis: Good.

Mucciardi, 64, and president of his home-based business Tree Radar Inc., uses noninvasive methods to assess the composition of trees and their roots and is able to produce a report that plots decay in the tree, which typically starts at the bottom and works its way up. He likens it to giving a tree a physical exam.

“You wouldn’t know,” he said. “They all look healthy.”

With a black handheld radar machine slightly larger than a shoebox and no heavier than a hand-weight, Mucciardi is able to fire electronic waves into a tree every two-tenths of an inch, digitizing the tree’s density at six different heights.

He records the results on a computer attached to the machine with a long cord.

From there, he’s able to run the results through software he developed and produce a report for a client that includes a cross-sectional picture showing the level of decay. Similarly, he can roll the machine over the ground and determine the layout, density and size of a tree’s roots, and map them on his computer. It takes about 20 minutes to scan the tree and about two days to get a report to a client.

“We’re the physician,” he said. “We do the initial physical and give the report to a ‘specialist.’”

In this case, the specialist is typically a certified arborist, who can use the report, along with other visual factors, to help determine the tree’s fate.

Using a noninvasive method to assess the health of a tree is preferable to drilling a hole in it to determine the amount of decay, because that method often provides a way for more fungus and spores to find their way inside a trunk, said Tolbert Feather, arborist for the Town of Chevy Chase and owner of horticulture consulting firm Feather & Associates.

If trees are severely decayed, eventually they could fall. Just a few houses up the street from Mucciardi, a tulip poplar fell on the house, literally slicing it in half, he said. The tree was so decayed that it was completely hollow on the inside.



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“Once they come down, you’re into some big bucks,” he said.

Mucciardi has a contract with the Maryland Department of Natural Resources to assess trees, and sells equipment to other organizations, like the University of Maryland, College Park, so they can assess trees. He did his first inspection in July in Annapolis at the Governor’s Mansion.

He has also worked with municipalities like the Town of Chevy Chase to determine whether or not a neighborhood tree needs to come down. In some county municipalities, there are laws that regulate what you can and cannot do with the trees on your property and when it is acceptable to remove a tree.

“It takes a lot of the politics out,” Mucciardi said. “You can go up to someone and say, ‘This is what your tree looks like.’ It’s an MRI-type thing. It takes a lot of the emotion out of it.”

The system has been helpful for Feather, who began working with Mucciardi shortly after Hurricane Isabel took down several trees a year and a half ago.

“I just started thinking that there must be ways to look inside trees,” he said. “And at that point, I met Tony.”

The Town of Chevy Chase was already taking down several trees, so Feather said he and Mucciardi set up trials on those trees so Mucciardi could refine his software.

“We cut down the trees in sections so he could see how his readings coincided with the trees,” Feather said.

Feather has referred Mucciardi to some of the town’s residents, he said, and he thinks Mucciardi’s method is effective.

“It’s probably the quickest and easiest way to get an assessment,” he said.

The ability to determine a tree’s root structure is also a valuable way to save a tree during construction, Feather said.

Brett Linkletter, Takoma Park’s arborist, said he met Mucciardi last year at a conference and discussed the merits of using radar to assess trees. Tree radar, he said, mainly determines the health of a tree’s structure, not its physiology.

“I think what it shows us is if a tree is dead or decayed, or rotten inside, which doesn’t necessarily have to do with the health of a tree,” Linkletter said. “...A tree can be doing really well physiologically and be a mess structurally.”

While Mucciardi’s system may help detect structural tree problems, it’s not something Takoma Park would likely use, Linkletter said. The city doesn’t have the money to buy the equipment and if it did, it doesn’t have the manpower to use it since it usually takes two people to operate it.

He also said the city has so many trees that it would be costly to hire Mucciardi and his small team to determine the health of every tree that posed a potential risk. Instead, Linkletter said, he uses a visual approach, checking for holes in a tree’s structure.

Mucciardi, a visiting professor at the U.S. Naval Academy and an adjunct professor at the University of Maryland, has been involved with non-destructive examination for more than 30 years. He began studying trees about five years ago after examining utility poles that fell down.

It took a while to create a radar and software system that would depict the inside of a tree, because “we don’t really know what a tree’s supposed to look like inside,” he said. But Montgomery County let him use trees it had taken down as a “test bed,” and through trial and error, Mucciardi was able to refine his methods and software.

“It’s a virtual excavator,” he said.