Residents Concerned About Rotting Norway Maple Trees

Nature Notes

By Patricia Martin

I've had a lot of interest and feedback on last week's column on the problem of rot in Norway maples *(Acer platanoides)*. It seems after the fall of the tree in front of La Chance Cottage, a lot of people took a close look at their own trees. One question I've been asked is, how to tell a Norway from a sugar maple.

The Mackinac Island Community Foundation has a handout with illustrations showing the difference between the two species, available for those who would like to pick one up.

The easiest way to tell the difference this time of year is to look at the sap. Simply break a leaf off the tree and note the color of the sap that pools from the petiol (the leaf stem). If it's white, you have a Norway; if it's clear, it's one of the other maples.

Last week, I mentioned some of the signs to detect rot in a tree. I neglected to mention a couple of fairly obvious signs. If shelf or other types of fungus are growing on the tree, you have problems, or if leaves are growing smaller, looking weaker, or are not being produced at all on some branches, it's also indicative of problems. I've noticed several Norway maples with these signs as I've been walking through town.

There are now devices to detect rot in trees. The U.S. Forest investigated a number of machines to detect rot in a publication called "Tree Defect Detection." Foresters looked at a number of methods, grouping them as either invasive or non-invasive. I will mention just a few.

In the invasive group (meaning a hole has to be made into the xylem, the fluid-conducting tissue of the tree, for the device to work) one is the increment borer, the device used to help age lilacs, which I wrote about a few weeks ago.

The tool is inexpensive, costing $100 to $150, and the holes it makes range from 4.3 to 12 millimeters (mm) (0.169 to 0.500 inches) depending on the size selected. These borers have to be screwed in by hand, which takes time and effort, and multiple holes would have to be drilled, and still one could miss a rot pocket.

Similarly, the borescope requires a hole or multiple holes to be drilled into the xylem, for a small scope with a light to be placed into the tree to visually inspect the inside for defects. This, again, takes someone who knows what they're doing to operate this equipment, and kits begin at about $1,000.

Another xylem-invasive device is known as the shigometer. It was developed by Alex Shigo of the U.S. Forest Service Northeastern Forest Experiment Station. It's a battery-operated, lightweight field ohmmeter and was mentioned to me several weeks ago by one of the members of the Lilac Society. This instrument generates a pulsed direct current and registers the resistance to the current as it passes through the wood or bark.

To understand how it works, you need to understand some of the changes that take place in wood as it rots. Before wood begins to decay, it becomes wetter and contains more ions, which will directly affect the resistance to electrical current, and the current moves more easily through the tree.

To measure the resistance of the wood and therefore the presence of rot, a small hole, 0.1 inch or 2.44 mm in diameter is bored into the tree or branch. An electrical twisted wire probe is inserted into the bore hole and resistance readings are monitored. In sound wood tissue, relatively high resistance readings are obtained; as the wood becomes discolored or decayed, electrical resistance progressively decreases.

This is a fairly quick method of detecting rot with a portable, battery-operated drill, which can drill to a depth of 12 inches in less than a minute. These small bore wounds heal quickly in trees. Shigometers must be operated by a skilled technician, and who has a good understanding of the biology of the material being evaluated. The cost of these machines begins at about $1,708.

There are some non-invasive techniques for detecting rot in trees, and they include X-ray and gamma ray scanning. There are no good, portable, practical X-ray systems at this time that can be used on live trees. Gamma ray scanning is expensive, and for safety reasons, not easy to use (the technicians would have to stand back at least 200 feet for each shot).

There is an ultrasound technique, which seems to show promise. The device is called the Arborsonic Decay Detector (ADD). It is specifically designed to find decay in trees. It was designed in Japan to detect decay in telephone poles. It was recently modified to assess live trees, and is being developed and tested in England.

The device is about the size of a car radio, with two leads to a small transmitter and a receiver. The receiver and the transmitter are placed on opposite sides of the tree trunk. An ultrasonic pulse is "fired" through the xylem to the receiver, and the elapsed time is displayed digitally on the screen in microseconds. The signal has a velocity of approximately 2,000 meters per second via the cell walls in the tree.

The diameter of the tree is then measured in millimeters and divided by two to give the expected reading in microseconds for a sound tree.

If the tree is sound, the ultrasonic pulse can pass in a straight line to the receiver, giving a predictable reading. If the tree is decayed, the ultrasound cannot pass through decay and will have to pass around the rot, taking longer and giving a higher reading.

This machine is fairly simple, and takes only about 15 minutes to test the stump of a tree. It must be operated by someone who knows trees and decay types and mechanisms.

All of these technologies are useful for professional arborists and foresters, and the technology will become more user friendly and readily available as time goes on.

Most of us, for the time being at least, will probably use the age-old method of looking for outward signs of inward problems in trees – cracks, splits, dead leaves and limbs, foreign plants growing in crotches, woodpecker holes, signs of previous concerns (evidenced by cabling or other repair of trees), and fungal growth.

It's beneficial that professionals will have the option of using various technologies to scientifically support their opinions based on mere observation. It may help them to detect problems that might otherwise be missed.

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