



The Plant Doctor's LANDSCAPE TIPS

By Dr. David L. Roberts, The Plant Doctor LLC a.k.a. The Tree Doctor

WHEN SHEET HAPPENS: THE CASE OF Mn DEFICIENCY IN MAPLE

INTRODUCTION

In this great industry of ours, matters usually go according to plan, and we are happy. Sometimes, however, we get caught with our plants down. We all make mistakes, and we hope they are not catastrophic ones that can lead to plant loss or, gulp, injury to our clients, industry, and our company. Sheet happens.

Some of the more common problems are related to soil conditions and nutritional issues, specifically high soil pH and micronutrient deficiency. In many areas of Michigan, soil textures contain abundant clay, little organic matter, and are poorly drained . . . especially in new home sites. In combo with the poor drainage, these soils are often in the higher pH range, usually pH 7.0 and above. Two of the most common species affected by poorly drained soils and high pH are the commonly planted Red Maple (*Acer rubrum*) and Pin Oak (*Quercus palustris*). These two species are so widely planted that Landscape Architects and others in our industry fail to perform soil tests at proposed planting sites, that might foretell how a particular species will likely perform (Photos 1A & 1B).

I thought it might be interesting to relate a recent experience I had regarding a red maple.

ANNA'S RED MAPLE DILEMMA

Anna and her husband moved into their new home approximately 30 years ago. They established a landscape containing a diverse variety of plants. One tree they planted was a red maple. It was the only tree they installed between their home and a small lake in this affluent community. It is important to note that all residents in this community maintain their landscapes to the highest degree. Anna, like her neighbors, devotes significant resources to maintaining the healthiest landscape possible. They have enjoyed the red maple maturing over all those years and especially the brilliant crimson colors it emanates every fall.

Last year (2023), some neighbors noted to Anna that her red maple appeared a little peaked. Although the tree had probably exhibited a slightly yellowish appearance in previous years, Anna was not very concerned until it was brought to her attention. After all, the tree had been doing just fine for the previous 30 years. She sought assistance from an arborist company whose representative informed her about the Manganese (Mn) deficiency issue in her red maple. The company offered to treat the tree in the spring of 2024.

Not long after treatment, the leaves on the tree began to curl up and turn brown, especially towards the top of the tree. Anna and her family became very concerned about the health of their tree, believing it might be dying. The only thing that had changed in all these years was the injection of the tree by an arborist to help correct the Mn deficiency. With panic, Anna contacted the arborist who had performed the treatments for his assistance. The arborist diagnosed the problem as frost injury. Equally interesting, the

arborist's company offered to cut the tree down, grind the stump, and plant a new tree. This series of events seemed odd to Anna and her family.



Photo 1A



Photo 1B

Photos 1A & 1B: Typical of bad architectural designs, this boulevard was planted with red maples as far as the eye can see (1A). Apparently, no soil tests were performed to make sure this species is good fit for this site. All trees were showing signs of Manganese deficiency at this young age; the deficiency will only worsen as trees mature, turning red maple from a potentially low maintenance tree into a high maintenance species on this site.

A SECOND OPINION

Because the company representative had diagnosed frost injury, had not admitted to the possibility that their treatment may have caused the tree's rapid decline, but offered to remove the established tree and replant the site with a new tree, Anna was perplexed. Why would a company voluntarily offer to remove her tree and plant a new one when frost injury was involved? Is a company responsible for frost damage to trees? Things were moving way too fast for her. Anna knew she needed to slow things down a bit and obtain a second opinion. Smart move. Enter The Plant Doctor, aka The Tree Doctor.

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Upon arriving at the site, I listened to Anna's review of the circumstances and the long-term history of the tree, which is a favored specimen with the family. I examined the tree in a very meticulous manner. The tree appeared very unhealthy and in a serious state of decline (Photo 2A). The leaves were indeed curling up and turning brown just as Anna had described during our phone conversation. But these symptoms were not typical of any disease on red maple that I had encountered. I also examined the trunk. I noted the injection sites where a Mn product had been administered (Photo 3). Perhaps there were too many injection sites? Which could relate to an overdose of the Mn product? I also checked around the neighborhood for frost damage. I witnessed no frost injury on any tree, regardless of species. Even other red maples in the area appeared quite healthy. In Photo 2B, another very healthy red maple appears in the lower right-hand corner of the picture, across the pond.

In the meantime, the arborist collected tissue samples for tissue analysis; very high levels of Mn were found in the red maple samples. Concurrently, upon my request, Anna sought the product label used to treat her tree and presented it to me. For this particular product, a 3X label rate is recommended for



Photo 2A

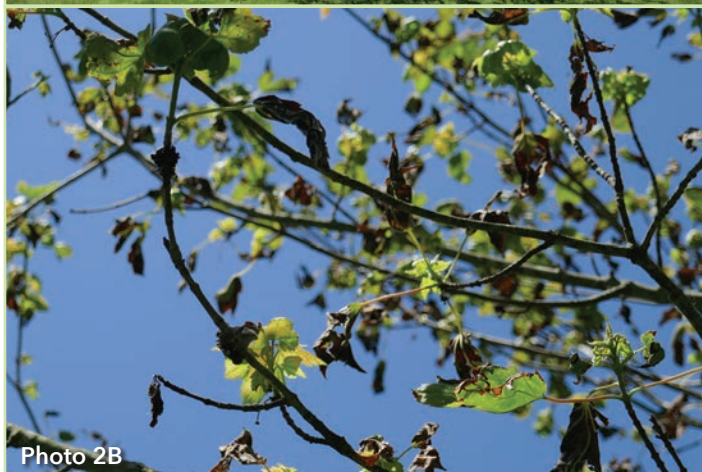


Photo 2B

Photos 2A & 2B: Anna described the symptoms on her red maple accurately when she contacted me for a second opinion (Photo 2A). The company had treated the tree with Manganese injections to ameliorate the micronutrient deficiency. Foliar curling and browning ensued (Photo 2B). Frost injury was diagnosed by the company, which also offered to remove the 30 year old tree and replant with another tree . . . perhaps in a panic response. I'm hopeful the tree will make a full recovery. We'll keep our fingers crossed. Replacement can always occur in the future.

injection in the fall when foliage is about to senesce anyway. However, only 1X rate is recommended during the growing season (spring) because rates greater than 1X are likely to cause foliar burn. *OOOOPA!* That's exactly what we observed. I had reached the rather obvious conclusion that the injection of the tree caused a phytotoxicity reaction to the Mn product. In my opinion, as I informed Anna, I suspect the tree may recover. It may take a year, but I think it has a good chance of not only tree survival but complete recovery.

RECOMMENDATIONS WHEN SHEET HAPPENS

By most industry standards, including my own, the company that performed the treatments to Anna's red maple would be considered a top-notch company for providing arboriculture services. So, what happened? Any number of things could've



Photo 3

Photo 3: The product label warned that using too much product could cause foliar burn (Photo 2B). In my examination of the stump, I wondered if there were too many injection sites, which could lead to the possibility of overdosing the tree.

happened. Technician error in mixing the chemical and/or application to the tree. Local weather conditions complicated the treatment. This particular red maple may react differently to the injected chemical, even the carrier solution, than other red maples. Or a combination of weather and chemical reaction to the injected product. I could go on and on with speculation. However, I think the arborist company, Anna, and I found the most likely culprit. Sheet Happens.

As most people in the industry know, I never reveal companies or clients I interact with. It is not my role to point the finger; we all make occasional mistakes. I am not the Arboriculture Police. Having been a scientist at Michigan State University for over 40 years, my mission in representing the university is to solve problems and provide educational materials. I continue that role in my small business, The Plant Doctor, in my semi-retirement. The following list represents some tips that might help us prevent or resolve problems when Sheet Happens.

Quality Control/Treatment Protocol: From a company standpoint, it is important that employees receive the best quality training, so mistakes are held to an absolute minimum. Quality control is extremely difficult today with the shifting labor issues. However, we need to do the best we can.

Don't Panic: If a problem does occur, we must never panic. It is reasonable for our clients to become alarmed because, from their perspective, they hired us to take care of their tree(s). When the tree appears to be suffering or declining, often after our treatments, it is logical for us to receive the blame. However, the problem may not have been caused by the arborist. There are very few problems in our industry where we must act within hours. In my opinion, the recommendation to remove the red maple, grind the stump, and plant a new tree after a diagnosis of frost injury was jumping the gun, especially if the tree has a chance of recovery. A slow and methodical approach to finding the causal factor is advised. Trees are tough. Sometimes procrastination may pay off; I've witnessed many full recoveries of trees when they were believed to be on their last legs (limbs).

Perform a Thorough Diagnosis: This tip is used in conjunction with "Don't Panic" (above). Testing may be necessary. There are private and public laboratories which can help. If uncertain, perform as many tests as possible. Examine other plants and other trees in the area, especially the same species of the afflicted. Scrounge as much information as possible. Sometimes, people will not come clean regarding what they have done.

Obtain Other Opinions: Obtaining other perspectives and opinions, as Anna did, is strongly recommended. We are fortunate to have so many experienced people in our industry. The Plant Doctor, aka The Tree Doctor, makes house calls and takes texts and phone calls.

Make Things Right: Anna had advanced my diagnosis and recommendations to the arborist company, whose employees agreed that watching and waiting might very well be the best advice for now, even into next year. I think all parties involved would be better served if the tree was given the opportunity to recover, even if it took some time. No starting over with a new tree for Anna and her family. No extreme expenses of tree removal, stump grinding, and replanting for the arboriculture company. In fact, the arborist agreed to plant a tree of Anna's choice from a stellar nearby nursery next year if the red maple does not recover to Anna's satisfaction. A great gesture by the arborist. 🌱

Dr. David Roberts has retired from Michigan State University but remains active with the industry. He can be reached at 248-320-7124 or treedoctordave@gmail.com.