The Plant Doctor's LANDSCAPE TIPS

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BOO BOOS: WHEN GOOD COMPANIES DO BAD

INTRODUCTION

We all make mistakes. In fact, mistakes help us learn things we might not have considered important previously. Have you ever read the book, "*The Logic of Failure*", by Dietrich Dorner? Much of the time, those mistakes are minor; sometimes however, they are humdingers. Yikes! As I recall, NASA's motto during the Apollo Program for "Man's" trip to the moon was, "Failure is not an option". That is the same motto I adhere to when I ride my motorcycle in this dangerous world of aggressive drivers. That motto could also be helpful in our individual businesses for quality control in our plant industry.

I thought it might be interesting to review just a few of the mistakes I have encountered in recent memory and then offer some advice for avoiding such kerfuffles. While concentrating on unwanted plant removal, it can be really dangerous to apply chemicals to landscapes when we try to eliminate weeds or invasive plants. While we might expect homeowners to make the bulk of the boo boos with chemical herbicides, realistically, about half of the problems I encounter occur with professional applicators. Why is that? I suspect some of the professionals do not read the labels thoroughly. Furthermore, professional applicators sometimes have problems with herbicides with which they have little to no experience; in some cases, they may never have utilized that particular herbicide before. Furthermore, I find that some herbicide labels are notoriously vague, not only to homeowners but to professionals as well. Perhaps the biggest blunder I can recall was DuPont's release of the "wonder herbicide", Imprelis, for broadleaf weed control in lawns around 2011 . . . before they had thoroughly tested the chemical's safety to trees and shrubs. Millions of trees east of the Mississippi were harmed or killed by Imprelis (Photo 1). A more local example occurred at a governmental award-winning landscape; a company that won the "Lowest Bid" applied an herbicide containing Imazapyr for long-term weed control to mulch rings and landscape areas. Many trees and shrubs, and even lawn grasses, were killed (Photo 2). This mistake, as with many herbicide misapplication situations, ended up as a litigious matter.

Sometimes, it is suppliers who recommend chemicals to nursery, landscape, and lawn professionals with good intentions for weed control, that may not, however, be appropriate for their intended use. Two examples readily come to mind. A supplier recommended an herbicide known as Milestone (Aminopyralid) to a company specializing in weed control in industrial and commercial businesses. When the herbicide was applied to cracks in the pavement (not landscape areas) at a strip mall, most honey locust died in the parking lot islands (Photo 3). Why? Milestone was developed primarily for use in pasture lands. Buried deep in the label's precautions is a warning that the herbicide is especially toxic to leguminous plants such as clover, alfalfa, honey locust, and redbud. In yet another example of a supplier snafu, an herbicide known as Mohave was recommended by the supplier to control weeds in paths and driveways in a retail nursery. Plant discoloration, distortion, stunting, and death ensured. Mohave herbicide also contains Imazapyr that moved with water into plant holding areas, into root zones, and, in this case, to the nursery's retention pond, from whence plants in the nursery were irrigated. Initially thought to be a nutritional disorder, a plethora of nutritional tests were performed to no avail. When I was called to

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Photo 1: When Dupont released Imprelis for broadleaf weed control in lawns in 2011, there had not been sufficient research to determine any collateral impacts on landscape plants. Millions of trees east of the Mississippi River were harmed or killed. Conifers and leguminous trees (i.e. honey locust) were especially affected.

Photo 2: When a company won the lowest bid to manage an award-winning landscape at a government facility, an herbicide containing Imazapyr applied to mulch rings and landscape areas harmed/killed many trees and shrubs. In this photo, most tree lilacs were destroyed.

Photo 3: A supplier recommended that a weed management company apply Milestone herbicide to pavement cracks for weed control. Most Honey Locust trees were killed at this strip mall. Buried deep in the label was a warning that plant death is likely to occur with leguminous plants.

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investigate, I immediately recognized the telltale signs of Imazapyr herbicide damage (Photo 4). In yet another example, a government entity decided that invasive Phragmites needed to be controlled in a lake. The government's winning bid subcontractor decided that application of an Imazapyr-containing herbicide by helicopter would be most efficient to control the phragmites. Unfortunately, many trees and shrubs in landscapes of private properties were harmed or killed (Photo 5).

Photo 4: A supplier suggested the application of Mohave herbicide to paths and driveways in a retail nursery for long term weed control. This herbicide contains Imazapyr, which leached into holding areas and eventually into a retention pond from whence potted plants were irrigated (Inset).

Photo 5: A government contractor authorized a company (subcontractor) to control Phragmites along a lakeshore. The herbicide, which was applied by helicopter (blurred inset), drifted into landscapes killing or harming many trees and shrubs.

INVASIVE PLANT REMOVAL BY MECHANICAL MEANS

Herbicides are not the only means for weed or invasive plant management. While herbicides may be extremely dangerous, especially if they are not well understood, the following example shows how dangerous other means of unwanted plant removal can be . . . in this case mechanical removal.

After purchasing another 10 acres adjoining her homestead property, Catherine decided she needed help in removing the invasive vine Oriental Bittersweet that had infiltrated her trees and shrubs in her woodland. Arborists at a tree care company reviewed the site and recommended mechanical removal of the invasive vine. The tree care company (contractor) contracted with another company (subcontractor) that had all the equipment necessary to accomplish the physical removal of the invasive vine (Photo 6). Work was performed in late May. Within a month or two, some of the oak trees on Catherine's property began turning brown with accompanying leaf loss. Catherine contacted the tree company asking them why the trees appeared to be dying. Apparently uncertain of the cause for the decline of the trees, the company nevertheless suggested that Catherine have them remove four trees that appeared to be dying (Photo 7). Subsequently, the company sent Catherine an invoice for the removal of those four trees. Confused about the tree issues on her property, Catherine contacted another arborist who immediately identified the problem as Oak Wilt, caused by damage to the trees when the bittersweet was removed almost two months earlier. Subsequently, I was asked to assist the arborist and Catherine with Oak Wilt remediation; when visiting the site, I witnessed severe injury to many trees on the property (Photos 8A & 8B). Apparently, the subcontractor had injured many of the trees on the property by their aggressive use of their equipment. The injury consisted of grinding into tree trunks, mechanical gashes on the trunks and lower branches, grinding roots in soil, and destruction of root collar areas on the lower trunk of many trees. Frankly, the 100's of scraping wounds created on the

Photo 6: Physical removal of Oriental Bittersweet from a woodland property required a variety of equipment such as rotary cutters, scrapers, and, in this photo, a Fecon-style tilling unit.

Photo 7: Mechanical injury to many species of trees including oaks on this property occurred when a subcontractor physically removed invasive bittersweet; as a result, at least six Oak Wilt epicenters over the 10+ acre woodland developed. In this photo, two months after the subcontractor's work, the contractor removed four oak trees dying from Oak Wilt, which caused the infection to spread to the lone standing tree. The removed trees are represented by the visible, blue-painted stumps.

bark when pulling the vines from the trees would be enough injury to attract sap beetles, the transmitters of Oak Wilt. But the large injuries (Photos 8A and 8B) ensured sufficient injuries for contraction of the lethal Oak Wilt disease.

So, what happened that led to these disastrous results for Catherine? I think several factors summarize the mistakes:

A. Mechanical removal and, hence, oak tree injury occurred during the high-risk period for Overland Spread of Oak Wilt. If mechanical removal was the preferred method of invasive plant removal, it should have been scheduled during the dormant period when little risk of Oak Wilt was possible. Two different companies (contractor and subcontractor) who work in Michigan arboriculture apparently did not consider the risks of Oak Wilt.

B. The contractor failed to accurately diagnose Oak Wilt before removing four trees on Catherine's property, likely resulting in more rapid spread of the Oak Wilt fungus when the four trees were removed (Photo 7).

C. In my opinion, physical removal was probably not the best management option for Oriental Bittersweet. The invasive plant may have been invigorated according to my observations (Photo 9). Careful use of an herbicide would likely have been more effective without introducing Oak Wilt to the property and without severely injuring all of those different species of trees on site.

D. Trees on the property were severely injured by the mechanized equipment. Apparently, trees at Catherine's property were considered to be of secondary importance to the primary objective of the removal of the bittersweet vines by subcontractor machine operators while Catherine considered the trees of primary importance. Even if many of the injured trees did not contract Oak Wilt, there would be long-term damage to surviving trees.

E. Apparently, the contractor did not vet the subcontractor and their capabilities nor convey specific instructions of its expectations to its subcontractor for the desired outcome(s) for the property owner.

F. The contractor in this present example would normally be considered a highly reputable company by most of us in the industry. I have worked with some of its arborist employees whom I consider top notch arborists. Something fell through the cracks and quality control of its services was absent.

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Photos 8A & 8B: These two photos represent the typical injuries to many species of trees on the property injured by the equipment of a subcontractor when removing invasive Oriental Bittersweet. Such wounds attracted sap beetles and the deadly Oak Wilt fungus to many oak trees.

Photo 9: Attempted physical removal of invasive plants can invigorate them and cause them to spread with greater aggressiveness.

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AVOIDING THE POTENTIAL FOR BOO BOOS

I initiated this article with the sentence, "We all make mistakes". Except for Dupont's Imprelis, which was frequently covered on national and local news, it is my policy to never reveal the name of companies who are involved in making boo boos. It is not my place to do so. I am not the ethical arbiter of business practices nor of policing companies. I must always maintain my integrity so businesses can trust me. My role as a scientist at Michigan State University for over 40 years was to perform research and extend that knowledge to Michigan citizens and professionals, not to embarrass anyone or point the finger. We all make mistakes, and I think we all learn from our mistakes. There are several factors that may help us avoid making serious boo boos. I am, perhaps, a little hesitant to make these suggestions because my occupation for over 40 years was as a scientist in academia, not as a successful businessperson. Nevertheless, since retiring, I have started a small business (The Plant Doctor, LLC, aka The Tree Doctor), so I can visualize aspects from a variety of perspectives. I think some of my suggestions for avoiding mistakes relating to the present topic are simply common sense:

1. If considering application of a "new" herbicide, ensure you know everything possible about it. Do other professionals have experience with it that could help you? For example, when Imprelis was released, some turf professionals converted completely to the new "technology" while others were more cautious and treated only a few lawns the first year. Those professionals who went full bore with Imprelis were likely less trusted by their clientele base than those who were careful.
2. When a new herbicide is recommended by a supplier, make sure that its use is fully understood as safe for its intended purpose. It might be good to obtain testimonials from other applicators.
3. When considering weed or invasive plant removal, be sure to explore all possible options and discuss these options with your clients. It might be wise to explain the risks and cost of each option so that your client can make the decision on which option they prefer.
4. Be sure to be aware of other ancillary issues that may result from your plant management strategy. Will application of an herbicide have impacts on non-target plants as, for example, Imazapyr often does. Many herbicides may affect other plants in the landscape or nursery that are not targets of plant management. Regarding removal of invasive plants such as Bittersweet from trees in woodland, it is wise to consider other impacts such as the potential for Oak Wilt.
5. When utilizing subcontractors, it is advisable to ensure that the contractor has conveyed the expected outcome of the relationship to the subcontractor. Is the subcontractor knowledgeable and qualified to perform the necessary work and not just the lowest bidder?

Be careful out there! Good luck!

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