



The Plant Doctor's LANDSCAPE TIPS

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

BMPs = BEST MANAGEMENT PRACTICES

INTRODUCTION

Members of our industry face many challenges. Plant Health Care Providers are, perhaps, among the most challenged. How do we attain the goals of beautiful and healthy landscapes the public expects from us while doing so with efficiency and safety in mind (Photo 1)? The variable weather conditions play a huge factor, much like farmers gambling on crop production. Can we get our treatments on before the rain starts? Will the rain wash our treatments off before they have a chance to dry on the foliage, potentially rendering our treatments ineffectual? Is the wind speed too high to make the required applications? We typically have narrow windows of opportunity for treatments, especially with respect to the significant number of clients we service during that narrow window; if we can't complete the treatments our clientele are paying for, some will not be happy with the results. Should I have done a soil test to make sure I've applied the correct fertilizer analysis for a particular landscape? How many of us perform soil or plant tissue analysis? Are my herbicide applications the correct ones to target the weeds or invasive plants in a particular landscape? In consideration of all these and many more variables, we are sometimes plagued with the notion, "The Customer is Always Right".

Recently, I received an email from Lauren Gott, Pesticide Certification Program Specialist with the Michigan Department of Agriculture and Rural Development (MDARD), who raised concerns about "Best Practices" in our industry, which was the impetus for this article on BMP. Please allow me to discuss a couple of disease issues that exhibit the importance of BMPs in our daily activities.

TRELLIS RUST ACROSS MICHIGAN

During the past year or so, I've stepped up warnings about the invasive disease, "Trellis Rust", because it has advanced from southeast Michigan, its initial site of introduction into Michigan, to western Michigan and north to the Saginaw Bay area over the last several years. It may be far more widespread than we currently know, which is why I have asked people in our industry to keep vigilant and report sightings to me during their travels. Trellis Rust can be quite debilitating to ornamental (and fruit) pears (Photos 2A & 2B), which was likely the most common replacement species

Continued on page 14



Photo 1

Photo 1: In our industry's effort to provide our customers with beautiful, healthy landscapes, the adoption of Best Management Practices can be a daunting but necessary consideration in our daily activities.



Photo 2A



Photo 2B

Photos 2A & 2B: The introduced Trellis Rust (aka European Pear Rust) can be debilitating to ornamental pear trees, likely the most substituted species for ash trees after the Emerald Ash Borer destroyed *Fraxinus* species in North America. In Photo 2A, the trees appear reasonably healthy in the spring even though they are highly infected with Trellis Rust lesions (Inset). Photo 2B shows the same trees by mid-summer and the withered foliage (Inset).

Through all these deliberations, we must bear in mind "Best Management Practices" (BMPs), often referenced as Best Practices (BP) by some individuals and entities. BMPs entail following the best protocols and procedures that enable us to achieve our goals while having little to no impact on people and the environment. Well, at least those should be our goals. BMPs usually involve practical, logical, and ethical decisions. Often BMPs are not clear cut; decisions are sometimes made spur of the moment, under pressure to achieve daily quotas and to satisfy our sometimes persnickety and highly expectant customers.



The Plant Doctor's LANDSCAPE TIPS

BMPs = BEST MANAGEMENT PRACTICES

Continued from page 13

for ash trees (*Fraxinus* sp.) after the Emerald Ash Borer decimated ash tree populations in Michigan.

At the 2023 MGIA Trade Show in late February/early March, I devoted a full hour program to Trellis Rust to hopefully help us minimize the plethora of misunderstandings about the disease. Because there is little information about disease control, I have relied heavily upon our knowledge about our native rust diseases (on cedar-apple, -hawthorn, and -quince) with similar disease cycles to advise Plant Health Care Professionals in Michigan about managing Trellis Rust by fungicide applications. I have also relied, at my request, on many of you to provide feedback about Trellis Rust management based upon your experiences. In one of these scenarios I presented at the 2023 MGIA Trade Show, I described the application of fungicides to *half* of a tree because the arborists saw an open window to an apartment near the landscape where the tree resided; the arborists did not want to risk pesticide drift into the open but screened window. This scenario raised some concerns from MDARD personnel who believed no application should have been made until the window was closed. Hence, the recent email from MDARD specialist, Lauren Gott.

To back-track a bit, when I learned of the results of Trellis Rust control by the arborists at this site, I visited the apartment complex on June 26, 2018. What I saw was quite interesting. Photo 3A shows the tree in proximity to an apartment building and an open window (red arrow). The side of the tree that was not sprayed with fungicide (left in Photo 3A, towards the building) exhibited abundant Trellis Rust lesions (Photo 3B). Some of the infected foliage had already dropped to the lawn; more was likely to follow as the disease is known to cause defoliation. Severe cases will eventually result in twig/branch death and ultimate tree decline

(Photos 2A & 2B). On the sprayed side of the tree (right in Photo 3A, away from the building), there were no lesions of Trellis Rust whatsoever (Photo 3B), indicating 100% efficacy by the fungicide application. In careful examination of the tree and the site, I noticed that there was a sharp demarcation between the treated and non-treated sides of the tree, indicating pinpoint application of the fungicides. The absence of disease control on the building side of the tree, as discovered in a "forensic manner", also indicated no likely drift of the fungicide application which had been made on May 18, 2018. I think it is important to understand that when the application was made, the arborists noted a potential problem and adjustments were made with very good intentions in mind. Nevertheless, the lack of evident drift plus the clearcut evidence of suppression of Trellis Rust on one side of this tree at this site does not negate MDARD's concerns for BP.

MDARD's legislative mandate is to ensure that pesticides, their storage, and their applications are done properly and have minimal impact on people and the environment. With that, I am glad that they contacted me so I could convey our need to be mindful of BMPs when dealing with pesticide issues in our industry. While MDARD emphasized the open window aspect in their email to me, there are innumerable other variables about which we need to be aware. For example, will someone emerge from a building while we are spraying pesticide into the air? Will a curious child run across the parking lot to see what the arborists are doing? Is our application near an operating air conditioner intake? In Photo 3A, there is a parking lot just to the right of the tree; is someone smoking a cigarette while sitting in the car with the windows rolled down? In our industry, arborists and landscapers are frequently asked to perform services in very difficult situations.



Photo 3A

Photos 3A, 3B & 3C: At this apartment complex in 2018, arborists applied a fungicide treatment to one-half of the ornamental pear because the applicators noted an open window (Photo 3A, arrow). While this procedure might not be consistent with Best Management Practices, we gleaned some highly useful information. The untreated half of the tree towards the building exhibited abundant Trellis Rust lesions and leaf drop (Photo 3B) while the fungicide-treated half (right, away from the building) demonstrated 100% control of the disease with only one application (Photo 3C).



Photo 3B



Photo 3C

While there are concerns about BMPs at this location (Photo 3A), we learned significant information about this Trellis Rust situation, which I felt was important to convey to the industry and the reason I discussed it in my program at the 2023 MGIA Trade Show. I need to qualify my statements that application of fungicides and the resulting outcomes are by no means a replicated scientific research endeavor. It is observation, which in my opinion can nonetheless be useful. Too many times I receive testimonials that indicate a treatment was applied and very little disease occurred . . . when in fact, there may have been little disease that year anyway. It is rare that treatments are

made to halves of trees, which provides a better understanding of “disease pressure” in the area and the efficacy of the treatment. In this situation, the arborists demonstrated that one, well-timed application of fungicides provided 100% control of the disease. Too often, several applications are made several weeks apart because that is the planned schedule. I have often stressed the narrow window of opportunity for control of Trellis Rust and that treatments after lesions form on the foliage (Photo 3B) will have no impact on disease development and can best be described as detrimental to the environment. The arborists also demonstrated that the fungicides they applied were effective for Trellis Rust . . . among other benefits we gleaned from reviewing this situation.

At the 2023 MGIA Trade Show & Convention, I discussed a variety of topics in my program on Trellis Rust. These topics should align nicely with Best Management Practices (= Best Practices) whose ultimate goal might be to reduce pesticide usage and/or provide alternatives to pesticides:

- Proper Timing of Treatments
- Registered Fungicides and their Efficacy for Rust Diseases
- Separation of Heteroecious Rust Disease Host Plants
- Tree Species Alternatives to *Pyrus* sp.
- Genetically Resistant Tree Host Species
- Obligate Parasite/Pathogen Management
- Misinformation on the Internet
- Cultural Disease Management vs. Pesticidal Disease Management
- Alternative Timing of Fungicide Treatments (Spring vs. Fall)
- Shifting Nursery Production Away from *Pyrus* sp.
- Modifications in Landscape Designs by Architects (Photo 4)
- Methods for Minimizing Impacts on Pollinators, etc.

OAK WILT

In Michigan, the Best Management Practices for Oak Wilt management are discombobulated. The resulting confusion and misunderstanding seem to be primarily

due to politics. Let me explain. For several decades, the Michigan Department of Natural Resources (DNR) has been using and promoting what is known as the Bruhn Model for Root Graft Disruption (RGD). The Bruhn Model, which I now reference as the DNR/Bruhn Model because the DNR has modified the procedure in several ways, entails severing roots between diseased and healthy trees to prevent the spread of the deadly Oak Wilt fungus. If used correctly, the procedure can work but is extremely destructive (Sketch #1). In contrast, I created the Tier Tree Model for RGD in 1984, almost 10 years before the Bruhn Model was developed, and have been using it successfully for almost 40 years. In comparing the DNR/Bruhn Model with the Tier Tree Model for the purpose of Best Management Practices, my Tier Tree Model usually sacrifices few trees or no trees. For example, I’ve documented a situation where 32 large, healthy trees would need to be destroyed because of one infected oak tree when the DNR/Bruhn Model was proposed. In another Oak Wilt situation, over 60 healthy trees were planned to be sacrificed to remediate Oak Wilt with the DNR/Bruhn Model. In both cases, as well as others, I was asked to intercede because the

Continued on page 16



Photo 4

Photo 4: The Perfect Storm for Trellis Rust is planting Junipers near or under ornamental pears, an all-too-common landscape design in Michigan. Separation of these two host trees with newer landscape designs could eliminate the need for chemical treatments. Note the decline of the pear tree due to Trellis Rust in this photo. (Photo credit: Gary Olgart)



Sketch #1: This “Artist Rendering” of the DNR/Bruhn Model for Root Graft Disruption to stop Oak Wilt transmission through roots grafts involves placing two trench lines 5-6 feet deep around a large population of trees followed by destroying all oak trees within the trenches, including all healthy oak trees. This technique, needlessly destructive and promoted as the official recommendation by the Oak Wilt Coalition and an arborist society through the Oak Wilt Qualifications Program, cannot be consistent with Best Management Practices.

The Plant Doctor's LANDSCAPE TIPS

BMPs = BEST MANAGEMENT PRACTICES



Continued from page 15

techniques I developed are far less destructive. My procedures were effective. A comparison of the DNR/Bruhn Model with the Roberts' Tier Tree Model is disclosed in Photos 5A & 5B.



Photos 5A & 5B: The author's Tier Tree Model plus Tree Injections were used at this site to stop the spread of Oak Wilt to other trees on this property and to trees on neighbors' properties (Photo 5A). Photo 5A was taken seven years after remediation efforts, which required no destruction of any oak trees beyond the original seven trees that became infected from Overland Spread. In other words, the remediation recommendations were 100% successful with no sacrifice of any healthy trees and no further spread of the lethal Oak Wilt disease to other trees in the community. Photo 5B shows a satellite image of the affected property (arrow) and the community in 2022, seven years after the initial Oak Wilt incident. Note that Oak Wilt has been completely eliminated from this community. The yellow circle delineates all the trees that would have needed to be destroyed if the DNR/Bruhn model had been implemented seven years earlier. I think it is very clear which procedures are supportive of Best Management Practices and which are destructive to the environment and to people's landscapes and bank accounts.

Another modification of the DNR/Bruhn Model occurred around 2015 when the DNR adopted and recommended Triclopyr/Double Girdle Technique in lieu of RGD (Photo 6). Referring to Sketch #1, the implementation of Garlon 4 herbicide to double girdles of all trees within the imaginary RGD lines would be just as destructive as the DNR/Bruhn RGD Model. In my observations, however, I documented failures with this technique on public lands managed by the DNR. My research segued into testing Garlon 4 and its efficacy for killing oak trees to stop the spread of Oak Wilt. In replicated research trials, I learned that Triclopyr (Garlon 4) had no impact on the health of oak trees. I have been using Glyphosate in a Stump Cup design technique since 2008 to kill oak trees to stop Oak Wilt quite successfully. In more recent research, I demonstrated that 41% Glyphosate at the one teaspoon labeled rate per 12 inches dbh was highly effective at killing oak trees while dozens of teaspoons of Garlon 4 per tree had no impact on the health of treated trees. From a Best Management Practices' perspective, Glyphosate is far superior to triclopyr.



Photo 6: An herbicide procedure I refer to as Garlon 4/Double Girdle was adopted by some of the DNR and individuals/entities in lieu of the DNR/Bruhn Root Graft Disruption method (Sketch 1). Unfortunately, this procedure has not been proven to be effective in stopping Oak Wilt, and the use of Garlon 4 used in the procedure was demonstrated by the author to have no impact on tree health, meaning herbicide applications are likely serving no purpose and are contributing to polluting the environment. The use of this herbicide procedure cannot be supportive of Best Practices.

DISCUSSION

The concept of Best Management Practices (BMPs) is very important in our industry as well as most other livelihoods. In this publication I discussed two diseases and issues surrounding BMP. Clearly, we need to be cognizant of the application of chemicals, which can be dangerous to the public, to the applicator, and to the environment. That is why MDARD is charged with ensuring we follow BMPs. However, the application of gallons of triclopyr to Oak Wilt sites when the herbicide has no verifiable impact on the health of oak trees is problematic and cannot be considered consistent with BMP. What I really wanted to convey in this article is that BMP is far more broad ranging than the application of pesticides. In reviewing the competing Oak Wilt Management protocols involving RGD (trenching) to sever root grafts to stop the spread of Oak Wilt, one method is highly destructive and the other is not. Best Management Practices, regardless of what we are doing, should have the least adverse impact on people and our environment. 🌱

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