

The Plant Doctor's LANDSCAPE TIPS

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

OAK WILT 'WHACK-A-MOLE' A SLIGHT VARIATION OF 'CHASER'

INTRODUCTION

Oak Wilt, a lethal disease especially of members of the red oak family, is being reported in more and more locations around Michigan (Photo 1). As such, arborists and the public are sometimes advised on remediation efforts that are confusing and not necessarily in the best interest of our industry and our clientele. One concern is that certain entities and individuals, some of them without much experience and credentials, have inserted themselves as experts in leadership positions where they have purposely excluded science and practical information that could help us all fight the Oak Wilt menace with much greater efficiency.



Photo 1

Photo 1: At this Oak Wilt site in northern Michigan, an oak tree (right) became infected via Overland Spread several years previously (Note bark shedding). Subsequently, the Oak Wilt causal fungus moved underground and was transmitted through root grafts to two trees (left), which are now exhibiting the telltale signs of Oak Wilt infection. A Conservation District employee recommended the DNR/Bruhn Model according to her training regimen; the implementation of this remediation model would have resulted in the destruction of dozens of sacrificial healthy oak trees. Instead, the property owner chose the Glyphosate/Stump Cup 'Chaser' method with excellent results and NO sacrifice of any trees.

The author of this article has been involved with Oak Wilt for nearly 40 years. A variety of Oak Wilt management tools and protocols have been created by the author since 1984. One of the most impressive developments (at least in this author's opinion) is the invention/creation of the Glyphosate/Stump Cup technique that debuted in 2008. With years of work with Glyphosate and other herbicides, I noted the significant advantages of using Glyphosate over other herbicides such as triclopyr, 2,4-D, dicamba, etc. for the control of woody plants-trees, shrubs, and vines. Another important observation with Glyphosate is how fast the herbicide is translocated systemically through plant tissue. Hence, I decided to test Glyphosate on oak trees for the management of Oak Wilt. In short, it turns out in numerous trials in actual field experiments, that Glyphosate transmits through oak trees systemically much

faster than the Oak Wilt fungus moves. Glyphosate is also far more effective than other herbicides traditionally used in arboriculture and forestry.

The Glyphosate/Stump Cup technique involves making a shallow girdling cut at a downward angle so that the herbicide Glyphosate can be poured into the stump cup, also known by some arborists and foresters as 'Frill Cut' (Photo 2). The Glyphosate is absorbed by the oak tree leading to rapid death of the treated tree, whether it is a healthy specimen or an Oak Wilt-infected casualty. Several variations of this technique are summarized as follows:

Glyphosate/Stump Cup 'Tier Tree Model: With the 'Tier Tree Model' of the Glyphosate/Stump Cup, a tier (or two) of healthy trees surrounding an infected oak tree or group (epicenter) of infected oaks are sacrificed by implementation of the Glyphosate/Stump Cup Technique. To my knowledge, where this technique has been employed in my research at actual Oak Wilt field sites, it has never failed to contain and eradicate Oak Wilt from a site. Perhaps its main drawback is the sacrifice of a few healthy oak trees surrounding an "epicenter" of Oak Wilt-afflicted trees. However, the sacrifice of a few healthy trees by this method pales in comparison to the most costly and destructive DNR/Bruhn Model, which is being promoted by the DNR and an arborist society through the Oak Wilt Qualifications program.

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Photo 2

Photo 2: The Glyphosate/Stump Cup is accomplished by making a shallow "cup" or trough with a chain saw aimed at a downward angle as this arborist is demonstrating. Glyphosate is subsequently poured into the stump cup (Inset)-note pooling of the Glyphosate herbicide. The twig (Inset right) was inserted as a dam to prevent loss of herbicide in a slightly non-level stump cup. The herbicide is generally absorbed by the tree very quickly.



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Glyphosate/Stump Cup 'Half Moon' Model: With this model, a Half Gridling (Half Moon) cut to a tier of healthy trees is made instead of the full circumference girdling cut. The design of this model was to theoretically send systemic Glyphosate in the direction of the advancing Oak Wilt epicenter where the deadly oak wilt fungus is advancing through underground transmission through root grafts. A slight variation of this would also be to half-girdle and treat infected trees. The basis for this design is to prevent collateral damage from Glyphosate to trees that are destined for preservation. While this technique has not been tested for its efficacy in the field to any appreciable extent, it has proven in experimental trials that Glyphosate is far more effective than triclopyr (Garlon 4) and other herbicides at killing oak trees and stopping the transmission of Oak Wilt fungus through root grafts.

Glyphosate/Stump Cup 'Chaser': In a third variation of the Glyphosate/Stump Cup technique, I experimented with using Glyphosate on infected oak trees only. I named this variant 'Chaser' because the herbicide seems to chase down the Oak Wilt fungus and passes it within the systemic vascular system of

the infected oak tree. The mode of action appears to be that the Glyphosate, after passing the Oak Wilt fungus in root tissue, kills the roots ahead of the advancing Oak Wilt fungus and hastens its death by preventing it from transmitting through root grafts to nearby healthy trees. In many field trials where the 'Chaser' has been used, Glyphosate toxicity symptoms may appear in nearby healthy trees, usually as minor collateral damage that most commonly results in complete tree recovery. Most importantly, the Oak Wilt fungus fails to transmit to nearby healthy oak trees when 'Chaser' is implemented. In fact, 'Chaser' has been highly effective in stopping the progression of Oak Wilt at many oak tree sites over many years . . . without the sacrifice of healthy oak trees. It is the most cost effective, environmentally friendly, and easy technique for Oak Wilt management of all the possible options.

RESEARCH UPDATE: 'CHASER WHACK-A-MOLE'

To my knowledge, at least in my research trials, there has never been a failure of 'Chaser' to stop Oak Wilt if the technique is applied to Oak Wilt-afflicted trees within a few months to a year of "Overland Spread" to those trees. I'll provide just one example of successful 'Chaser' remediation of Oak Wilt herein of many I could

present. At this Oak Wilt site in northern Michigan (Photo 1) on extensive property owned by a Medical Doctor, a representative from the Michigan Conservation District recommended the DNR/ Bruhn Root Graft Disruption Model be used to control Oak Wilt. Application of this method would have resulted in the destruction of dozens of healthy trees, something the property owner would not tolerate. An arborist who wanted to include this as a project in my research, applied the 'Chaser' variant of the Glyphosate/ Stump Cup Technique with no sacrifice of any healthy trees. The tree on the right had been killed several years previously (note bark had shed from branches) and has moved underground to trees in the left of the photo; these trees are now showing typical symptoms of Oak Wilt. The application of 'Chaser' several years ago resulted in successful eradication of Oak Wilt from the property. As we can imagine, the property owner was elated with the results.

In 2023, however, I encountered two situations where 'Chaser' failed to stop Oak Wilt. Both instances involved older Oak Wilt sites which had initially been infected via 'Overland' means but which for several years had enlarged by "Underground' transmission, thus creating an Epicenter of Oak Wilt. In older Oak Wilt sites where multiple trees have been infected for several years, the Oak Wilt fungus has colonized the massive underground root systems, especially on larger trees. If 'Chaser' is applied to trees in these older sites, it stands to reason that Glyphosate might not be able to permeate and reach all those roots where the Oak Wilt fungus might be "hiding". At one site, for example (Photos 3A and 3B), Emily had rejected the DNR Bruhn Model as too destructive because it would have required at least 60 healthy oaks to be sacrificed. She opted to become part of my research, and the 'Chaser' was applied to all dead and infected oak trees in February 2023. The application seemed to be working very well until September when one tree exhibited the telltale signs of Oak Wilt (Photo 3C); apparently the Oak Wilt fungus had breached the Glyphosate dead root zone barrier . . . although it is possible



Photo 3B: In June, three of the large trees subjected to the 'Chaser' method are visible by their stumps and girdling cuts. A minor amount of Glyphosate toxicity was visible in a couple of the surrounding large trees, but trees will readily recover from the minor impacts. One smaller tree near the three large treated stumps was likely killed by Glyphosate. Emily takes Oak Wilt very seriously and has become an expert in her own right; she stored the infected wood under tarps, removed the bark from the stumps to prevent pressure pad formation, and sprayed the stumps with 10% sodium hypochlorite (bleach) to ensure death of any surface Oak Wilt fungus.



Photo 3C: Everything with the 'Chaser' treatment seemed to be going well until the oak tree in the center of this photo collapsed in September. We presumed it was a breach of the Glyphosate treatment even though there is a possibility of Overland Spread to this tree. This tree and any other Oak Wilt cases that pop up will be subjected to the 'Chaser Whack-A-Mole' technique.



Photo 3A: This photo represents my first visit to Emily's property in January, 2023. Several trees had been infected by the Oak Wilt fungus for 2-3 years, representing an older, established Oak Wilt site. Treatments by the Glyphosate/Stump Cup 'Chaser' technique were applied in February, 2023, only to the several large oak trees infected by the Oak Wilt fungus.

that the tree became infected from Overland Spread. We chose to assume it was a failure of the 'Chaser' treatment. I presented Emily with the options which included the Glyphosate/Stump Cup Tier Tree Model and continued application of the 'Chaser'. Her reply was, "You mean Whack-A-Mole?" I thought, "what a novel summation of what we were trying to accomplish". The phrase has stuck, and I am now using it in my communications. Originally, I had designed 'Chaser' to not only chase the Oak Wilt fungus down in roots but to also be applied to Oak Wilt infected trees

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as they 'pop up', hence the phrase 'Whack-A-Mole' (Photo 4). Theoretically, the continued application of 'Chaser' should eventually encompass the destruction of all Oak Wilt transmission through Underground Spread at a given site, without substantial sacrifice of many healthy oak trees. I think it will work. So, Emily opted to continue the application of 'Chaser' in the name of science and to contribute to my research on Oak Wilt management.

For clarity, the reason 'Chaser' was effective in the older Oak Wilt site featured in Photo 1 is that after the oak tree on the right of the photo had been infected by Overland Spread, its only way out via Underground root graft transmission was through the two trees in the left of the photo (there were no other oak trees in any direction but to the left). Application of 'Chaser' to these two trees was, in effect, the application of 'Whack-A-Mole' treatment of infected trees as they "popped up".

I'll keep the industry apprised of the success of the 'Whack-A-Mole' variation of the Glyphosate/Stump Cup 'Chaser' technique. 🌱

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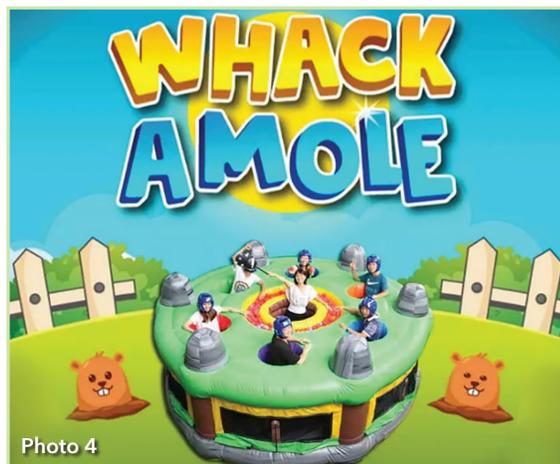


Photo 4

Photo 4: Some of us might remember our youth and the games we played. Whack-A-Mole helped children improve reaction times and taught them how to be violent (Just kidding). Who would've thought that basic design of Whack-A-Mole would one day be utilized in Oak Wilt management?