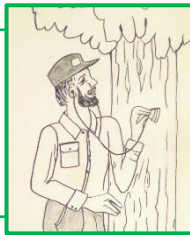


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Superiority of the Glyphosate/Stump Cup Technique Over the Garlon 4/Double Girdle Technique For the Remediation of Oak Wilt

by

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June 28, 2021

Introduction:

Two herbicides are currently used in Michigan for the remediation of Oak Wilt (OW): Glyphosate and Garlon 4. The Glyphosate/Stump Cup method was designed by the author more than a decade ago to provide a more economical management tool for containing and eradicating OW in lieu of costly and destructive Root Graft Disruption (RGD) and/or Tree Injections. Over the last 10 years, the Glyphosate Stump Cup technique has proven successful when used in conjunction with the author's Tier Tree Model at many locations around Michigan.

A variation of the Glyphosate/Stump Cup technique is now being tested: I refer to it as 'Half Moon'. The 'Half Moon' can best be described as the application of Glyphosate to "half girdles" (=half "Stump Cup") of trees in the direction of the advancing Oak Wilt front. The objective is to try to control the direction of Glyphosate translocation to help protect oak trees that are destined for preservation.

Materials and Methods:

An objective of the present research was to test the efficacy of Glyphosate and Garlon 4 herbicides in their ability to kill trees to prevent transmission of the Oak Wilt fungus through root grafts. The design of this replicated experiment is very simple. For one treatment, a 'Half Moon' Stump Cup was created, and Glyphosate was administered to the half girdle (Photo 1). As another treatment, Garlon 4 was administered to 'Half Moon' Double Girdles (Photo 2). Rates (volume) of herbicides were administered similarly to what would be applied to full girdles for each method. For example, the 'Half Moon' Double Girdle was sprayed twice to expose the treated trees to the same amount of herbicide (Garlon 4) that trees would normally receive with a *full* Double Girdle treatment. Replicate treatments were spaced in a woodland with sufficient distance between trees to avoid any possibility of cross contamination of herbicides between treatments and treated trees. Treatments were initiated in the fall of 2020; data was collected in June 2021.



Results and Discussion:

Results within replicate treatments were 100% consistent. ‘Half Moon’ Glyphosate/Stump Cup trees could best be described as “Stone Cold Dead” (excuse the non-scientific terminology) in June 2021 (Photo 3). There was no evidence of life in any of the treated trees (no bud swell, no foliage emergence, etc.). In contrast, all trees that received the ‘Half Moon’ Garlon 4/Double Girdle leafed-out with full foliage (Photo 4). The foliage exhibited normal color and structure. There was not even a hint of Garlon 4 herbicide toxicity symptoms on the foliage.



There are several important factors we know about trees and their biology:

- 1) *Girdling Trees by Stump Cup or Double Girdle will kill Trees above the Girdle.***
- 2) *The Root Systems of Girdled Trees may remain alive for years.***
- 3) *The Root Systems of Girdled Trees may remain alive indefinitely if they are root-grafted to live trees, which may use the Girdled Trees’ roots as extensions of their own root systems.***
- 4) *Half Girdles (‘Half Moon’) will not kill trees.***
- 5) *If we are to stop Root Graft transmission of the Oak Wilt fungus, we must kill the roots of Oak Trees.***

The results of this experiment were quite revealing. Because the ‘Half Moon’ treatment of oak trees by either girdle method (Stump Cup or Double Girdle) will not kill them, the application of either herbicide to the ‘Half Moon’ girdle should be a true test of that herbicide’s impact on oak trees. The results indicate that Glyphosate is highly effectual for killing oak trees while Garlon 4 had no verifiable impact. According to a Michigan Department of Natural Resources (DNR) representative, the Garlon 4/Double Girdle technique (my terminology) was adopted from American Indians who were trying to use this method to control Oak Wilt in other states. Apparently, the Garlon 4/Double Girdle technique was employed and has been used by the DNR for years without verification of its efficacy. And I assume there is no peer-reviewed and published paper about this method in a Scientific Journal either. My present ‘Half Moon’ study essentially confirms my prior observations at DNR-established sites of Garlon 4/Double Girdle Technique failures at not only killing Oak trees but at containing and eradicating Oak Wilt.

A property owner informed me that the DNR promoted and implemented The Garlon 4/Double Girdle Technique in 2020 along her property line and state land to prevent Oak Wilt from advancing into her and other private properties in a critical dune area; based on my research, I am skeptical this procedure will work. It should be obvious that we need to kill the root systems of Oak Trees if we are to effectively stop root-graft transmission of the Oak Wilt fungus. Hence, I think this research lends further evidence that the Garlon 4/Double Girdle Technique will not likely be effective in remediating Oak Wilt compared to the highly efficacious Glyphosate/Stump Cup Technique.