Program to Treat All Of My Red Oaks and Pin Oaks To Prevent Oak Wilt

(This paper will answer absolutely every question a layman would have about treating oak wilt)

By Jim Cook

May 16, 2025

We have four and one-half acres of land in Burnett County, Wisconsin. We have owned the property for over 20 years. The large trees on the property are many white oaks, red oaks and pin oaks. There are more than 250 total oaks ranging in size from 10-inches in diameter to 40-inches in diameter, with many being century oaks. The previous owners on the property would periodically burn the land so that the oaks were the only major trees. Since we have owned the property we have nurtured the native white pines and have quite a few pines in the four to six-inch diameter size now.

Four years ago we saw our first incidence of oak wilt, and lost nine century oaks in a period of three weeks. The next year we lost three more. And then only one the next year, but last year we lost five more century oaks. All of the trees were red oaks or pin oaks.

This year in April 2025, I contacted Paul Cigan who is the Forest Health Specialist in the Northwest Division of the Wisconsin DNR. Paul visited our home and took a look at our oaks.

The five oaks that succumbed to oak wilt last year were still standing but were slated to come down the next week. The photo to the right shows those trees after they were cut down and chunked.

Paul said we had quite a few white oaks, which was good, because they were not as susceptible to oak wilt as the red oaks and pin oaks were. As he explained, red oaks and pin oaks can interconnect their root systems. A tree that has contracted the fungus in its root system will pass it on to another oak that is connected to the diseased one. Once the fungus gets into the trunk, the tree dies quickly. He said any red oaks or pin oaks within about 100-feet of an infected tree, will ultimately contract the disease and die. This was very disheartening to hear.

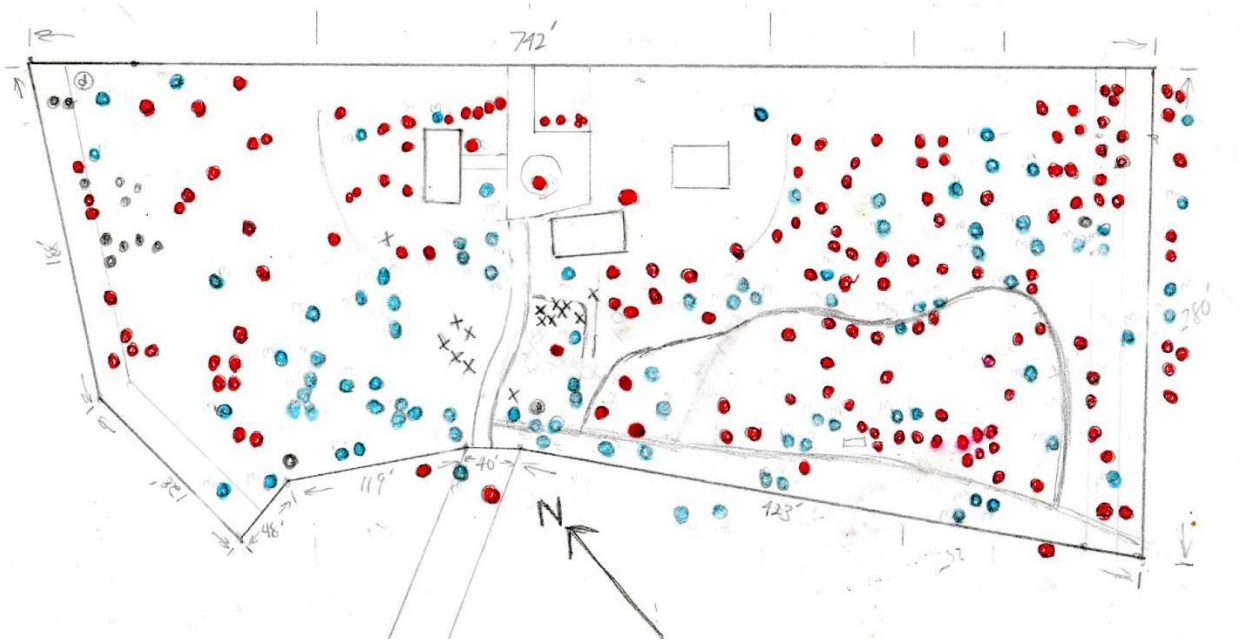
But then Paul said that there was a treatment that was effective in protecting an oak from oak wilt, even if the fungus was in its roots. He said the treatment was shown to be effective in protecting an inoculated tree for about two years, and then the treatment had to be repeated. He gave me a link to a paper written by Ryan Blaedow, a Forest Health Specialist in the North

Caroline Division of Forest Resources. The paper, *Research Update on Propiconazole as an Effective Tool for Managing Oak Wilt*, was originally published in ***Clippings***, Fall/Winter 2010.

I was very excited about the possibility of saving my remaining oaks. It is so sad to see a century oak die and I did not want to have to witness any more becoming infected. I told Paul that I was interested in inoculating every single red oak and pin oak on the property with propiconazole. At that time, I estimated that I would be inoculating somewhere in the neighborhood of 60 to 75 oaks. This excited Paul. He said he was not aware of another single landowner that had endeavored to protect that many trees on his property.

Paul said the treatment should be in the first week in June. This gave me about a month to order everything I needed and to prepare for the inoculations.

I needed to know exactly how many trees I would be inoculating and what each's diameter was. So, the first thing I needed to do was to create a map of the trees on our property. I took the survey of the property and made an outline of the boundaries and the structures on the land. I then went out and inventoried the oaks on the property and put them on the map. Red oaks and pin oaks were denoted as a red dot, white oaks were donated as a blue dot. The locations of the oaks that had died from oak wilt were marked as "X's" on the map.



I was shocked when I completed inventorying the trees. I didn't have 75 red oaks and pin oaks, I had 150! And that was only counting trees with a diameter at least 10". The great news was I also had 100 white oaks.

I read Ryan Blaedow's paper many times and also did more research about the treatment on the internet. The treatment essentially was that I was to drill an 11/64" hole 1-1/2" deep at a 45 degree angle every three inches all the way around the circumference of each tree. Other articles said the distance between holes should be 4-6" apart. I decided to go with the 3" distance. So a 20" diameter tree, using the formula ΠD would have a circumference of (3.14)(20) = 63" so would require 21 holes to be drilled.

The company selling the spring-loaded injectors was found at chemjettreeinjector.com. The number of injectors I needed to buy would be determined by the largest tree that would be inoculated. I have two red oaks that were 32" in diameter, so would need (3.14)(32)/3 = 33 injectors. An individual injector cost $15, but I could buy a box of 30 for $420 with free delivery. So, I ordered 30 injectors. The injectors can be reused many times as long as I properly clean them.

The article said that a single inoculation would be 20 mls of a 50% solution of propiconazole 14.3. So, a 20" tree would have 20 holes x 20 mls / 2 or 200 mls. So, a single gallon (3,785 mls) would treat 19 oaks. I went to solutionsstores.com on the internet and ordered six gallons of Quali-Pro Propiconazole 14.3 at $79/gallon.

The article also stated that each hole should be plugged with a 6 mm wooden peg. Amazon sold packets of 500 6 mm x 30 mm wooden pegs for $10. If I were going to inoculate 150 20" oaks, I would need 3,000 pegs, so they were ordered for a total of $60.

In addition, it was noted that I should have spray silicon to keep the injectors working properly so I ordered a can at $9. I also ordered long rubber gloves for my protection. The article also said it was very important that the 11/64" drill bits were sharp, otherwise during the drilling they might polish the hole and the fungicide might not get into the tree easily. So I order 10 High Speed Steel drill bits treated with black oxide, and 10 Cobalt HSS drill bits, in case one type was better at drilling into hard oak vs. the other. The total bit cost was $25.

Since I was going to be working in the woods on varied terrain, and I had to dilute the propiconazole to 50% strength, I didn't want to be messing with that while I was in the woods.

So, I purchased four 500 ml graduated glass jars with a narrow neck and a screw cap. I planned on putting 250 mls of propiconazole in each jar with 250 mls of water. The amount in each jar would treat approximately one oak. The jars were of such a size that the syringe would just fit into the jar and reach bottom, so I could fill a syringe without much chance of spilling or having the fungicide come in contact with me.

It was May 20th and I had all of the supplies I needed to get started, and I was itching to do just that. I gave Paul Cigan a call and asked him if there was anything specific that said I had to wait until June before I started. Paul forwarded a paper to me written by Jordan Eggers et. al. titled *Evaluation of Propiconazole Operational Treatments of Oaks for Oak Wilt Control*, published in 2005. The article detailed research conducted in 1998 on red oaks and white oaks being inoculated with propiconazole. The paper stressed the treatment needed to be done after the trees had experienced "full leaf expansion". Full leaf expansion normally occurred in early June.

On June 2nd I was ready to go. We had experienced some nice rain the previous week, and the articles I had read said the treatments should be done after a rain. My first tree was a 20" diameter oak by the house. I quickly learned several important things during that treatment. First, the springs on the syringes were unbelievably strong. It took considerable energy to pull one fully back when filling the syringe. This fact negated the ability of me to fill from the glass jars. I had to fully grasp the barrel of the syringe with one hand while drawing back with the other. I put the 50% propiconazole solution in a Cool Whip container to be able to fill each syringe. Second, I would drill one hole, leave the drill in the hole while I filled a syringe, and then removed the drill and inserted the syringe. I did this because it was sometimes quite hard to find the drilled hole, especially on a tree with deep gnarly bark. I also took a small hand held level and made a mark on the top of it at 3". I would put this next to the last syringe done and when it showed level, drilled a hole at the 3" mark. This allowed me to circumvent the tree and be at the proper height when I got back to the first syringe installed. It really didn't take long to put 20 injectors in a tree. And it was impressive that if you fitted the syringe tightly into the drilled hole, it did not leak. Lastly, anytime I was working with the fungicide in any way, I had on goggles and long rubber gloves, and I had sprayed myself with DEET to avoid ticks.

I could not find any information about how high up on the trunk to make my holes. I saw photos with syringes ranging from one foot to three feet off the ground. I decided to stay about one to one-and-one half feet off the ground, but occasionally an anomaly on the tree would cause me to go higher.

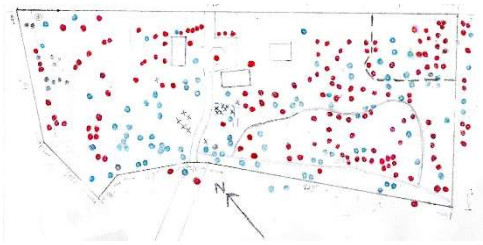
Typically, it would take a tree about 2-1/2 to 3 hours to empty most of the syringes. Each tree might have two or three that were quite slow, but most syringes could be removed and the holes sealed with a peg in that time. Although I had two trees up by the house that were extremely slow and tied up my syringes for 48 hours!

I filled two 5-gallon pails half full of water and put them in the back rack of my ATV. To one I added 32 ounces of bleach (7%) to 2-1/2 gallons of water and labeled it 'sanitizer'. To the other pail I labeled it 'rinse'. When I removed a syringe, I would do an elaborate sanitize and rinse that involved me drawing back on each syringe 6 times! So, each time I used a syringe, I drew it back 7 times! I did 15 very large oaks using this method, and by that time, my body ached, and I had blisters on my hands! I was desperate. I decided to call Erik Johnson, who is the exclusive distributor in the USA of the ChemJet Tree Injectors, hoping that he sold a device that would draw back the syringe automatically. Erik answered the phone directly. It turns out that Erik lives in Michigan and has been routinely treating more than 100 red oaks on his property for the last several years. He repeats the process every two years. I asked him if he had lost any oaks that he had treated, and it was great to hear that he had not lost a single treated oak. When I explained my problem, he laughed. He said he did not sell an automatic filler, but that I was creating my own problem. He said he uses a syringe, and when he removes it, he draws his sanitizer into the syringe and drops it into the solution. He leaves it in the sanitizer for a minimum of 10 minutes. When he removes it, he discharges the syringe and is ready to use it again. No rinsing. That would certainly make my life easier! I adopted Erik's cleaning with one modification. When I remove the syringe from the sanitizer and discharge it. I put it in clean rinse water, draw the barrel back slightly and discharge it. This didn't take much energy, and I didn't have to worry about sanitizer being in the syringe that might react with the fungicide.

As I proceeded to treat more and more trees, my methodology continued to change. I learned that leaving the drill stuck in a tree while I filled a syringe resulted in lots of broken drill bits. Plus this was not efficient. I learned the most efficient system was to fill about 10 syringes, and then drill, put the syringe in the hole, drill, etc.

I also learned that when I put a peg in the drilled hole, I should leave about ¼" of the peg exposed. It was unbelievably hard at times to see the pegs in a treated tree, and this became quite helpful in seeing the line of pegs after a tree had been treated. In all of the trees that I ended up treating however, I only once accidently started to treat an already treated oak.

I was very impressed with the quality and workmanship of the Chemjet injectors. I was worried about breaking off a tip as I pushed the injector into a drilled hole, but that never happened. During the course of treating all of my oaks, the injectors got dropped, sat in strong bleach solution for long periods, and they never showed any worse for wear. However, occasionally when drawing back a plunger, the tip would pop off and I would have to open the syringe up and pull the tip out of the barrel using a long Allen wrench to hook the tip. Anytime I opened a syringe, I would wipe out the barrel, spray the tip with silicon and then reassemble the syringe. With time and use, some of these tips, which Chemjet terms 'washers', would develop cracks as shown in the photo, and would no longer stay on the plunger. Chemjet sells a bag of 5 replacement washers for $5, so I purchased an extra 10. But remember, by the time I was done with my project, each syringe had been used 70 or 80 times, so this certainly was not a quality issue.



As I neared the end of the project, it was apparent that I would be slightly short of having enough propiconazole to do all 150 trees. Add to that the fact that I was getting pretty tired of the treatment routine I had been doing for the entire month of June. I decided to not treat about 20 oaks that were in the northeast corner of the property. (Denoted by the dotted line in the upper right corner of the photo.) These trees were bordered by open land to the east, highway 70 and open land to the north, sheltered by my house, garage and greenhouse to the west, and probably 40 to 50 feet higher in elevation than the area to the south and about 500 feet from where I had encountered oak wilt. It seemed a reasonable risk not to treat these trees.

When the dust had settled, I had treated 134 red oaks and pin oaks. 22 untreated red oaks and pin oaks remained in the northeast corner of my property. The treated trees ranged in diameter from 10" to 42", with the average diameter being 20". My original plan was to have the holes 3" apart but in reality, I would say the holes were actually 4" apart. The average tree had 16 holes

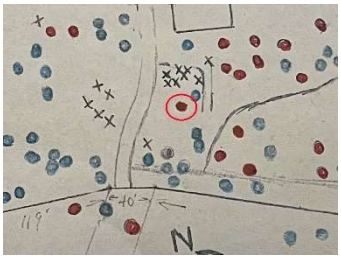
drilled for injection. It had taken me 27 days to inject the 134 trees. The major amount of time delay was waiting for the syringes to empty. Had I had twice as many injectors, the length of time for the project would have been considerably less.

One other note. I had read about the need to change drill bits frequently to keep from polishing the inside of the drilled hole and affecting the time for the tree to absorb the fungicide. Near the end of the project, the chuck on my drill broke and I could not remove the drill bit. The last 20 or 25 trees were done with the same bit. I would sterilize the bit on the drill after each tree. I saw absolutely no problem with absorption rate of the fungicide into these trees.

And what was the grand cost of this noble endeavor? $420 for 30 injectors, $10 for 10 additional injector washers, 6 gallons of propiconazole 14.3 for $480, 20 drill bits for $25, spray silicon for $9, 8 pairs of rubber gloves for $12, 3,000 pegs for $60, 4 gallons of bleach for $20 and 4 graduated bottles for $22, for a grand total of $1,058. That cost does not include about 20 gallons of elbow grease however. That works out to be $7.90 per tree. That seems extremely reasonable to protect a tree from oak wilt for two years.

When I was done, I filled each syringe with sanitizer again and let it sit in the sanitizer for 10 minutes, before giving it a final rinse. Then, I popped the ears on the barrel to release the tension on the spring. I let the syringe completely dry and then sprayed the plunger tip with silicon and placed it back in the barrel, but leaving the tension off of the spring. This is the way I stored the syringes until they will again be used in two years. The photo to the right shows everything cleaned and dried and ready for storage.

Current plans for the next treatment in two years are first to ascertain that I successfully protected all 134 trees. Right now, I plan on purchasing an additional 30 injectors when that time comes. I would suspect that I might have to replace several tips from my current syringes. They will tell me by popping off when I try to fill them.



One final very amazing note. When I was inoculating the red oaks, there was one remaining survivor right in the middle of the kill zone. At that time I asked myself, “How did this red oak possibly survive?” All of its kin on all sides of it had succumbed to oak wilt. And at the time I was inoculating it, it looked healthy.

Within days of my inoculation of that tree, and a second located on the north side of the property, they both started to have their leaves turn brown and fall off. In that first week of July it appeared that these trees already had oak wilt in the trunk and that I was too late with the fungicide. But in mid-July both trees started growing new leaves, stating at the top of the tree. And the growth spread. Now, in the first week of August, both trees have young small leaves from top to bottom and seem to have shaken off the disease! Every other time one of my red oaks got oak wilt, it was dead in three weeks. It seems that the fungicide can even save a tree when the oak wilt is in the trunk if the timing is right. I guess I really won't know until next spring and will be very eager to watch both trees at that time.

I would like to give Paul Cigan from the Wisconsin DNR a big thank you for all of his help and guidance, and a huge thank you to those researchers who did the initial and follow-up research to come up with a successful procedure that protects these beautiful oaks.