

# TreeIQ

*Summer 2020*

**The Minnesota Tree Inspector Quarterly Newsletter**



# Table of Contents

**3 Update on 2020 Recertification Requirements**

**4 Dr. Eric North Accepts Position as UCF Faculty in the University of Minnesota Department of Forest Resources**

**5 TreeIQ Featured Tree Inspector:  
Jeff Haberman, Rochester Park and Recreation**

**8 Assessing strength loss in trees: knowing when it's time to correct and preserve or say goodbye**

**9 Recognizing Herbicide Damage on Berry Plants**

Annie Klodd, Extension Educator - Fruit and Vegetable Production, University of Minnesota

**13 Notes from the MN DNR**

**14 Tree Stem Protection**

Gary Johnson & Daniel Wattenhofer, University of Minnesota, Department of Forest Resources

*Cover: original watercolors by Monica Randazzo*

*Submit photos to [treesins@umn.edu](mailto:treesins@umn.edu)*

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## Update on 2020 Recertification Requirements

Hello Tree Inspectors,

We hope that this message finds you well and in good health. This year has brought a lot of added stress to people's personal and professional lives. Due to that added stress and potential travel constraints many of you are facing, **we are reducing the 2020 recertification requirement to one hour of continuing education.**

We are working to develop a new remote recertification option to help folks recertify on their own time. This online recertification option will be made available on September 8<sup>th</sup>, 2020 and must be completed by December 31<sup>st</sup>, 2020. You will be able to register for this online course at: <http://www.mntreeinspector.com/>

**This reduction in continuing education requirement is only being reduced for the calendar year 2020. In 2021, recertification requirements will remain at six hours of continuing education.**

Thank you in advance for your patience and understanding as we chart the best way forward.

All the best,

Ryan Murphy, University of Minnesota

Valerie McClannahan, MN Department of Natural Resources

## Dr. Eric North Accepts Position as UCF Faculty in the University of Minnesota Department of Forest Resources

The University of Minnesota's, Department of Forest Resources search for the faculty position in urban and community forestry has reached a successful conclusion. Dr. Eric North has accepted the offer for this position. He will begin his appointment in the Department of Forest Resources in late December.

Eric is currently an Assistant Professor of Practice in Regional and Community Forestry in the School of Natural Resources at the University of Nebraska-Lincoln where he developed a 4-year degree program in Regional & Community Forestry. His primary responsibility is preparing students for successful careers in urban forestry, arboriculture, and natural resource management in the built environment. He teaches courses in green space & urban forestry management, arboriculture, tree biology, and dendrology, for which he was awarded the Holling Family Award for Teaching Excellence in Spring 2020.

Eric also serves in numerous capacities for professional organizations and on community boards, including the International Society of Arboriculture (ISA), the Arboriculture Education and Research Academy, and the Lincoln Community Forestry Advisory Board. In 2018, he served as a Diversity and Inclusion Fellow, a position awarded by the Office of the Executive Vice Chancellor. Eric is also an ISA Certified Arborist.

Eric has an interest and passion for communicating science to improve natural resources in urban areas



and for working with people and trees to enhance the built landscape. Through research in urban tree biometrics, tree rings, storm and construction damage, and volunteer engagement, he hopes to advance scientific understanding, education, and community engagement as they are critical components to greening urban landscapes. His research has been published in peer-reviewed journals and Extension publications, including *Urban Forestry & Urban Greening*; *Journal of Forestry*; and *Arboriculture & Urban Forestry*.

Eric is very excited to be coming back to the University of Minnesota Department of Forest Resources to work with the great faculty and communities of Minnesota.

# TreeIQ Featured Tree Inspector, Summer 2020

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## Jeff Haberman

### Rochester Park and Recreation

Interview by Gary Johnson, University of Minnesota, Department of Forest Resources



People become connected for as many different reasons as there are different people. I connected with our summer edition's featured tree inspector from a very unique perspective: gravel. Specifically, pea stone. And that interest in gravel has kept us as friends and colleagues for over 15 years.

I probably should provide a bit more background to the gravel story before you meet Jeff. About 15 years ago, I became interested in gravel beds for holding bare root trees or containerized trees with poor root systems (read, pot-bound beyond belief) after a visit with Chris Starbuck at the University of Missouri. Although using pea stone or coarse sand as media for heeling-in bare root trees was an aged nursery practice, Chris carried and promoted that idea to much greater heights, and coined it the "Missouri Gravel Bed System." We all owe Chris a lot for promoting this concept by preaching the "Gospel of Gravel" all over the Midwest. One problem, though.

People too often think their part of the country is the toughest for trees and nursery practices, and doubted that a Missouri Gravel Bed System would work outside of Missouri. This is where the story about Jeff Haberman starts, when I found out that he was using the gravel bed system in Fargo very successfully. By-the-way, Fargo is nothing like Missouri! Anyway, knowing that Fargo was using the system and had been for several years was an inspiration and motivation to begin our species performance research at the University of Minnesota, so thanks to you Chris and Jeff. And now the interview begins.

**TIQ: What is your current professional position and how long have you been in that position?**

JH: For the past six years, I have been the city forester for Rochester, MN, the third largest city in Minnesota.

**TIQ: I know that you've had a pretty extensive career in urban forestry and arboriculture. Would you tell us a little about how you developed your knowledge, skills, and experiences?**

JH: I received my B.S. in plant sciences from North Dakota State University in 1992. After graduating from College I started my own plant health care/landscape maintenance company. I did that for 10 years in Fargo, North Dakota. I began thinking about a career change at that time and had always been interested in working more closely with trees. Shortly thereafter I accepted a position as an Arborist with the Fargo Park District, in 2003. It was a requirement of the position to become an ISA certified arborist which I accomplished that same year. That was an eye opening experience and I tried to become a sponge and soak up all the information I could with respect to tree management at the municipal level. After about 6 months working as a field arborist I had an opportunity to be promoted to Park District Forester and stayed in the position until 2014 when I applied for and was hired for my current position.

**TIQ: I know (obviously) that you are a Minnesota Certified Tree Inspector, but I don't know how long you have served in that role.**

JH: I have maintained my Tree Inspector Certification for about 15 years.

**TIQ: What are some of the more challenging aspects of your position or your role as a tree inspector?**

JH: One of them is certainly the ability to stay close to trees. I find myself getting pulled in so many directions that my time in the field is at a premium. Fortunately I have extremely qualified coworkers who I value and trust to be my eyes and ears.

Another major challenge is managing construction impacts to trees and getting other departments to realize the long term impacts of this damage. Rochester is undergoing significant changes with the implementation of Destination Medical Center. We are in the process of creating a Tree Preservation ordinance which I hope will go before council for a vote soon.

**TIQ: Okay, let's flip that question over. For someone who has been in this profession for as long as you have, there must be some rewarding moments.**

Oh yes, there are, and for one, working with volunteers has been rewarding. We continue to improve on how we engage citizens of Rochester in volunteer activities. We hold two community tree planting events each year (pre-Covid 19) and we would have planted our 8,000th tree this spring thru the efforts of our local tree friendly nonprofit called R-Neighbors. We continue to look for opportunities for volunteers to engage in urban forestry. We have a group of dedicated citizen pruners and just began a new program called neighborhood tree watch.

Also, we finally secured funding to create an Urban Forest Master Plan and canopy cover change analysis. This will provide a long term management strategy and provide information regarding the value of our urban forest resources in Rochester. We just had our first meeting with the consultant overseeing the project. Very exciting!

*TIQ: That's so good to hear. Volunteers can be a real boost to a community's capacity to get work done, and who wouldn't want their political support? The Master Plan is a real coup for Rochester, too. It's surprising how few communities have an urban forestry master plan.*

**Another question: IF you believe the tree inspector program is a valuable program, what positive roles do/can tree inspectors engage in with their community's management of trees?**

JH: Promoting BMP's (Best Management Practices) for tree care, tree planting and spreading the word about tree benefits. I also think we need to play a

role in educating people about EAB and management of ash on private property and preach the word about tree diversity.

**TIQ: Have you had a memorable experience as a tree inspector/municipal arborist/municipal urban forester that you can share with us?**

JH: I came across an Ohio buckeye that originated on private property which from street side appeared to be laying on the ground and covering up the sidewalk. I had a crew in the area doing storm work so I directed them to this address. We were discussing how well trimmed the tree appeared to be as a hole had been carved out of the canopy so pedestrians could use the sidewalk without even ducking down. Just then someone walking their dog walked thru as if they had done so a thousand times. Shortly after the homeowner came out wondering what we were doing and I said contemplating clearing the sidewalk. He informed me that the tree tipped over 15 or more years ago and he loved it that way and had worked hard to prune the tree so people could walk under it. He went on to say that if we touched it, he would have to snap me in half. We left.

**TIQ: All is not rosy in the urban forestry world. What are the biggest challenges statewide that urban foresters/arborists/municipalities are facing with the sustainable management of community trees?**

JH: Loss of Canopy is a big one. Of course EAB is making this much more real but so is development as city populations grow. This is a big issue in Rochester. Also I think we cannot stop educating decision makers on the importance of dedicating money to EAB management.

**TIQ: Since you have been involved with tree care and urban forestry since 1992, you have earned "Yoda Status," and are now obligated to pass on sage advice to others. Don't be shy now.**

JH: I have learned that many people are very passionate about trees and the people that make the

effort to call my phone either love them or hate them. The biggest thing I have learned is not to take the bad calls personal.

**TIQ: That is good advice, oh wise one. Finally, what does Jeff do when he's not working as an urban forester?**

JH: My wife and I have a wonderful rural property that consumes our time. We enjoy gardening and growing our own food and keep a small flock of chickens that provide us eggs. I am passionate about disc golf and have built an 18 hole private course which I constantly work to improve to a championship level of play. Of course all I do is work on it and never get to play it, fortunately the course doubles as a complex of cross country ski trails during winter.

*TIQ: That sounds like a full life and a good escape from bad phone calls and pandemics. We all wish you the best of luck with your Master Plan success and your quest for disc golf Olympic Gold.*

Gary Johnson  
Professor, Urban and Community Forestry  
University of Minnesota

## Assessing strength loss in trees: knowing when it's time to correct and preserve or say goodbye

*A video presentation featuring:* Matt Berg, Chad Giblin, Ryan Gustafson, Kent Honl, Gary Johnson, Brian Luedtke, Elliot Redmann, & Tom Ritzer



The Minnesota Shade Tree Advisory Committee (MnSTAC) hosts monthly forums highlighting topics of interest for MN urban and community forestry practitioners, educators, and stakeholders. In the times of a global pandemic, these monthly get-togethers take a backseat to our community's health. But this didn't stop a group of folks passionate about tree preservation from getting together (socially distanced) to discuss the topic. The discussion took the form of recorded interviews which were edited together and broadcast as a live event on Thursday, June 18th. The production is available for anyone to watch on YouTube at the following link:

<https://www.youtube.com/watch?v=c2lqAdjX860>

Learn more about the Minnesota Shade Tree Advisory Committee (MnSTAC) here:

<http://www.mnstac.org/>

# Recognizing Herbicide Damage on Berry Plants

Annie Klodd, Extension Educator - Fruit and Vegetable Production, University of Minnesota

*This article was originally published on May 29, 2020 in [UMN Extension Yard and Garden News](#)*

Last week, I was concerned that the new primocane raspberries I just planted may have been damaged by 2,4-D and dicamba herbicides (i.e. Four Speed, Ortho Weed B Gon) that was sprayed on a lawn nearby to kill creeping Charlie. These herbicides are highly susceptible to drifting through the air and damaging (injuring) plants nearby. My grapes were showing injury symptoms, but they are the "canary in the coal mine" so to speak, for dicamba and 2,4-D injury because they are extremely susceptible.



So I went online to find photos of what herbicide injury looks like on raspberries, but did not find anything.

From there, I sent out an email to a network of fruit Extension specialists throughout the Great Lakes region for answers. Several of them provided helpful photos of herbicide injury on berries.

Below are a collection of photos of herbicide damage, primarily on raspberries, with a few on strawberries and blueberry as well. Fruit growers can refer to these photos if herbicide injury is suspected, and to be aware of what it looks like before it happens.

*Permission was granted by the photographers, for use in this article. If you wish to reuse these photos, please seek permission from the owners of the photos listed here.*

## **Glyphosate (i.e. Roundup) Injury on Raspberries and Strawberries**

Injury caused by glyphosate appears as yellow or white discoloration between the veins of the leaves. Often, the symptoms are more severe on the outer edges of the leaves, working inward.

Last week, I saw a small amount of glyphosate injury in a strawberry field where thistles and dandelions were spot-treated with glyphosate. In these cases, it can be difficult to avoid small amounts of drift to neighboring strawberry plants. Strawberries and raspberries can recover from small amounts of drift, but it is hard to know whether yield will be impacted.

The following four photos show glyphosate injury on raspberries, provided by OMAFRA. The second and third photos show symptoms on new spring growth, from herbicide drift that occurred the previous year.



**Above:** Close-up view of glyphosate injury on raspberries. *Photo credit: Melanie Ivey, Ohio State University*



**Left four photos:** Glyphosate injury on raspberries. *Photo credit: OMAFRA*



The next three photos show strawberry plants that were injured by glyphosate when it was accidentally applied to them (photos courtesy of Pam Fisher). This can happen if the sprayer was used previously to spray Roundup and not properly cleaned out after use.



**Three photos above:** Strawberry plants injured by glyphosate that was left in the lines of a backpack sprayer. *Photo credit: Pam Fisher, Fisher Berry Crop Consulting*

## 2,4-D Injury on Raspberries

2,4-D can cause curling and twisting of raspberry leaves. However, raspberries appear to be less susceptible to 2,4-D injury than dicamba injury.

Kevin Schooley shared the following photos with me. He reported that newly emerged primocanes (new shoots) sprayed with 2,4-D showed initial symptoms, but the plants had mostly recovered within a week of the application.



Above: 2,4-D injury on raspberry leaves.  
*Photo credit: Marvin Pritts, Cornell University*



Emerged primocanes after being sprayed with 2,4-D. They were almost fully recovered within a week, and symptoms were barely visible within two weeks.

*Photo credits: Kevin Schooley*

## Dicamba Injury on Raspberries

Raspberries are thought to be more sensitive to dicamba than to 2,4-D. The photos below show widespread drift injury on a raspberry field. The drift is believed to have come from a nearby field; the plants were not sprayed directly.

The drift occurred as the fruit were developing, and they were able to recover and produce a crop. However, it is not known whether fruit quality was impacted in this case. Symptoms included wilting, curling, and twisting of the leaves.



The three photos above show dicamba damage to a raspberry field following a poorly managed application to a nearby field. The symptoms are relatively mild, and mainly involve twisting of the stems. However, this demonstrates the impact of just a small amount of volatilization drift.

*Photo credits: Esther Kibbe, Cornell University.*

**About this article:**

*Author: Annie Klodd, Extension Educator - Fruit and Vegetable Production, Twitter: @MNFruitLady*

*Thank you to the Great Lakes Fruit Workers group for contributing content to this article, particularly Pam Fisher, Melanie Ivey, Esther Kibbe, Mark Longstroth, Kristen Obeid, Marvin Pritts, and Kevin Schooley.*

**[UMN Extension Fruit and Vegetable Farming Facebook Page](#)**

## Notes from the MN DNR

### Report oak wilt in Cass and Crow Wing counties

July 23, 2020

Invasive oak wilt is progressing northward in Minnesota into Cass and Crow Wing counties. To prevent the spread and loss of oak trees to this deadly disease, the Department of Natural Resources is urging residents and visitors in these counties to report suspected oak wilt now through mid-August.

Homeowners, landowners, and resort and tourism operators are on the front lines of oak wilt prevention, and are encouraged to [report possible oak wilt](#) through a new website created by the DNR and University of Minnesota-Extension as a part of an invasive species community science project.

While all Minnesota oak species are under threat from oak wilt, those in the red oak group are especially susceptible. Reporting will center on red oaks – oaks with pointed leaf lobes – because oak wilt is easier to identify on these trees. The website contains guidance on identification. Reports with a clear photo of the tree, branch, and leaves are most helpful.

“As its name suggests, the telltale sign of oak wilt is when oak trees suddenly lose all their leaves, notably in midsummer,” said Rachael Nicoll, forest health specialist in Brainerd. “The bad news? Oak wilt is deadly if left unchecked. The good news? Oak wilt is easy to prevent.”

Early detection is the best defense against oak wilt because it allows for proper prevention and management techniques. “Public reporting will be the key to protecting the uninfected forests in Cass and Crow Wing counties,” Nicoll said. Reports will be verified by staff with the DNR and the Minnesota Department of Agriculture, upon which submitters will receive an email notification.

Nicoll also cautions summer campers and recreationists not to move firewood. Moving oak firewood can spread oak wilt over long distances.

To learn more about detecting and managing oak wilt, visit the [DNR’s oak wilt webpage](#).

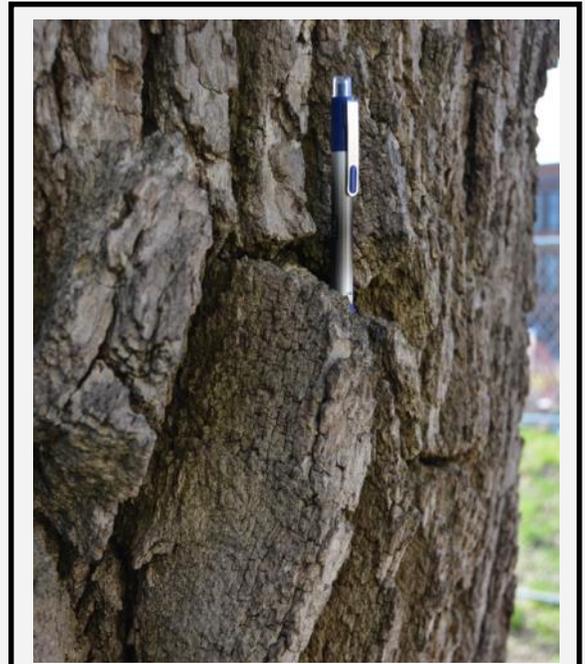
**[For more info on Minnesota’s Forest Health—Take a look at the latest Forest Insect and Disease Newsletter](#)**

# Tree Stem Protection

By Gary Johnson and Daniel Wattenhofer, University of Minnesota, Department of Forest Resources

## Part 1: What exactly is a tree stem protector protecting?

This sounds a bit foolish, but it isn't. Tree stems (aka, tree trunks) are vulnerable to different degrees of damage, depending on the species of the tree and its age. Imagine a mature cottonwood or a bur oak. Those tree stems are wrapped in a very thick layer of outer bark, 4-5" thick with some bur oaks (Figure 1). That outer bark is not living tissue, but it's placed to make sure the living inner bark and the tissues that build wood and bark are protected from temperature extremes, drying out, animals feeding on the stem, or mechanical equipment damage. It's the first line of defense for the functioning interior bark and wood of a tree.



**Figure 1.** The outer bark of a mature bur oak can be as thick as 4 inches. Note the perspective of the pen in the photo to the thickness of the bark.



**Figure 2.** Young red oak stem showing the thin outer bark and the light green cambium of the inner bark. Distance from outer bark to inner bark cambium was approximately 0.05 mm.

living cells (the "cambium") that is constantly producing those bark tissues to the outside, and wood to the inside (Figure 2).

Now imagine a young, smooth-barked tree in your landscape and how thin that protective outer bark is, and how easy it is for a hungry rabbit or a wayward lawnmower to break through it and kill part or all of

The living bark that the outer bark is protecting contains the tissues that move the sugars and carbohydrates produced during photosynthesis. It moves those sources of life-sustaining energy to tree buds, branches, and roots, as well as storage areas within the tree trunk. And to the inside of the inner bark lies a very thin (think microscopic in anatomy) layer of

that inner bark (Figure 3). **THAT** is what a tree stem protector is protecting...the life of the tree. But wait, there is even more!

Many trees have photosynthetic bark which contains chlorophyll and the ability to create energy for the tree to use for growth and tissue repair, especially when they are young. Granted, that outer photosynthetic bark is not nearly as productive as the leaves, but it does photosynthesize and helps develop stem caliper (diameter) on those young trees (Figure 4).



## Part 2: What is a tree stem protector protecting the tree from?

Stem protection is, at its most elemental, a physical barrier between the bark of a woody plant and an external force (heretofore referenced as “villains”. Most commonly that external force is mechanical, such as an animal (or a spouse with a lawnmower, string trimmer), or a non-target chemical drift. While the offender may differ, the result is the same: the destruction of cambial tissue. When the cambium is damaged, it reduces the tree’s ability to transport water and nutrients, which can lead to branch dieback, decay, and/or an early death of the tree.

It’s spring time and the snow is melting. What do you see with those younger trees in your landscape? Basically, dirty dinner plates. All winter long, rabbits (stop calling them bunnies), voles, pine mice, deer (stop calling them Bambi), and porcupines have been sustaining their lives by feeding on that tender, nutritious inner bark tissue that is usually only a quarter inch or less beneath the outer bark. Or, maybe those young male deer are rubbing their antlers against those young tree trunks and literally scraping off the

outer bark. Too much testosterone, way too much testosterone (Figure 5).

Now it is summer, and string trimmers and lawn mowers are zooming around those tender tree trunks. It only takes one slip and the string trimmer or mower has whipped or crashed into the tree trunk, breaking through the outer bark and exposing the inner bark to sun and drying winds, and...tissue death (see Figure 6).



**Figure 5.** When male deer rub young tree stems to remove the “velvet” from their new antlers, this type of severe cambium loss is common and often results in the premature death of those trees.



**Figure 6.** Mowers and string trimmers tend to cause weekly damage to young tree stems during the growing season. Lawn mower deck damage to the left easily penetrates that outer bark, severely damages the inner bark and sapwood, leading to early and often severe instances of wood decay. String trimmer damage to the right is a common cause of damage to newly planted and young trees and can be equally damaging.

It's still growing season and the landscape manager is using herbicides around the base of the tree trunk to keep the grass and weeds down so they don't need to get too close with the string trimmer or mower. Consistent with the law of unintended consequences, photosynthetic tissues can absorb herbicides (weed killers) and suffer damage to the tree trunks or sometimes the whole tree (see Figure 7).



**Figure 7.** The stems of this young tree lilac absorbed the glyphosate spray that was applied near the ground line and contacted the thin outer bark, resulting in the disfigurement of the foliage for the growing season.

This damage could be as subtle as localized dead patches in the bark that eventually are less obvious as the tree forms new inner and outer bark or disfigured leaves for one growing season, or more long-termed damage such as the development of stem cracks. Stem crack wounds go through the bark into the wood, opening up the potential for decay to weaken the stem and shorten the tree's life.

According to research conducted by Hannah Mathers, formerly of the Ohio State University Extension, exposure of young tree stems to chemical herbicides like glyphosate can cause or worsen bark splitting in young trees, especially near recent wounds (pruning or otherwise) (Pollock, 2008). These wounds or cracks can also stress the tree and serve as potential openings for pests and pathogens. Furthermore, applications of glyphosate have been shown to reduce the cold-hardiness in some tree species. Other symptoms can include witches broom, stunted growth, chlorosis, malformed leaves, and/or death, and can happen years after the initial exposure.

Is that it? Nope, there are beavers, busy beavers...smart, busy beavers (see Figure 8). They know that younger, tender trees are easier to gnaw down and cart away to their little homes on the rivers, streams, creeks. Plus, it's easier for them to devour the tender buds and shoots when they've harvested the trees and they're lying flat on the ground.

### **Part 3: Identify the villain.**

Identifying the culprits that have bothered the trees in the past or that may be problems in the future is critical to the type of stem protection that will be most effective. For instance, if you note extensive bark stripping high up into the tree by late winter/early spring, that's not a rabbit or a deer (unless it was the largest rabbit or deer in the history of the world). Rabbits feed above the snowline to a distance up to 18-24 inches (depending on the type of rabbit).



**Figure 8.** *Beavers can cause significant damage to trees, even if they don't topple them completely. Beavers have chewed through the outer bark to get to the more nutritious inner bark of this mature tree, effectively girdling it and guaranteeing its early death. Photo Credit: Jim Blake.*



**Figure 9.** *A tree that has been severely damaged by porcupine feeding of the inner bark. Photo Credit: Katie Druwitz.*



**Figure 10.** In a low snow winter, rabbit feeding of the bark can extend almost to the ground line as shown in the photo to the left. In a deep snow winter, the rabbit damage can extend up and into lower branches, as shown on the apple tree to the right on branches that were 40-48 inches above ground. Photo credit for the photo to the left: Luke Plunkett.

Aside from the antler-rubbing damage, deer also feed on buds and branches within four to five (4-5) feet above ground. This feeding can be gentle and similar to rabbit damage, leaving the classic 45 degree angle to the cut, or they can cause some pretty gross damage when they aggressively rip off branches. Porcupines can start close to the ground but then work their way up into the crown of the tree, stripping the trunk and branches on their way up (see figures 9 and 11).

Finally, the smallest and sometimes the most damaging of all the animal damage: voles. Voles are scared...

to...death of raptors, so they tend to spend their winters under the protection of snow cover, feeding on that tender



**Figure 11.** Porcupine feeding off of inner bark, high in a birch tree. Source of photo unknown.



**Figure 12.** Vole damage to mugo pine. Snow had been plowed up and over the mugo pine during this winter, and voles had lived in and feasted off the cambium of these pines, under the protection of the snow cover for several months.

cambial tissue of the inner bark. You won't even know they are there, working on killing your trees until the snow melts in the spring.

## Part 4: Matching the protection to the villain.

It should be obvious by now that "one size does not fit all" when it comes to winter stem protection of trees and shrubs. Tall voles just don't match up to tall deer. To that end, matching the protection strategy to the villain is critical. There are two protection strategies (legal and ethical ones) that will be addressed here: exclusionary and olfactory.

Exclusionary tactics are those that physically keep the villains away from the plants. They can be specific to the stem or to the entire plant. Olfactory strategies as the name implies are those that stink, stink so bad that the animals that normally feed on the cambial tissues opt to seek out less offensive tree and shrub stems, ideally on your neighbor's property. Table 1 illustrates the options for matching villains to tactics. Table 2 specifically describes the individual tactic materials necessary to thwart the villains.



**Figure 13.** Snow had been plowed over the trunks of these trees all winter, providing a perfect winter feeding home for voles. By the time the snow had melted, the damage had been done, undetected.

**Table 1.** Tactics for minimizing stem damage by villain.

Villain	Tactic
Voles/mice	Exclusionary
Rabbits	Exclusionary, olfactory
Deer	Exclusionary, olfactory
Beaver	Exclusionary
Porcupines	n/a
Chemicals	Exclusionary
Mowers/weed whips	Exclusionary

**Table 2.** *Description of stem protection tactics.*

<b>Tactic</b>	<b>Description</b>	<b>Figure No.</b>
Crinkled paper tree wrap	Exclusionary protection from non-target chemical drift.	14
Flexible, plastic tree trunk protectors	Exclusionary protection from non-target chemical drift, mowers and string trimmers. Various sizes*.	15
White, corrugated, LDPE plastic	Exclusionary protection from non-target chemical drift, voles, rabbits, deer antler-rubbing, lawn	16
Spiral, plastic tree guards	Exclusionary protection from rabbits, deer antler-rubbing, non-target chemical drift, lawn mowers,	17
Plastic tree shelters	Exclusionary protection from voles, rabbits, deer antler-rubbing, lawn mowers, string trimmers,	18
Chicken wire, 0.5" to 1.0"	Exclusionary protection from rabbits, deer antler-rubbing, beaver damage. Various sizes*.	19
Welded wire fence	Exclusionary protection from rabbits, deer antler-rubbing, deer browse, lawn mowers, string trim-	20
Hardware cloth, 0.5"	Exclusionary protection from rabbits, deer antler-rubbing, beaver damage. Various sizes*.	21
UV treated, rigid plastic mesh tree guard	Exclusionary protection from rabbits, deer antler-rubbing, beaver damage. Various sizes*.	22
Hardware cloth, 0.25"	Exclusionary protection from rabbits, deer antler-rubbing, beaver, and vole damage. Various sizes*.	23
Mulch ring	Exclusionary protection from mowers, string trimmers (theoretically)	24
Liquid Fence™; Animal Stopper, Rodent Stopper™; Plantskydd™	Olfactory protection from rabbits, deer browse. This is only a partial listing of the many good olfactory repellents on the market, and not intended to promote any one product. Non-chemical, variety of oils, and organic additives to provide a foul-odor. Sprays or granular.	25,26

\*Recommended heights for stem protection

48 in - Maximum Deer Antler Rub Protection, Beaver

36 in - Minimum Deer Antler Rub Protection, Beaver

24 in - Small Rodents, Rabbits, Weed Trimmers, Mowers

18 in - Small Rodents (Mice, Voles), Weed Trimmers, Mowers

*These recommendations are simply guidelines, as an animal's capacity to damage tree stems may be influenced by winter snow drifts and their ability to balance on their hind legs.*



**Figure 14.** *Crinkled paper wrap installed on a newly planted tree.*



**Figure 15.** *Flexible plastic tree protector.*



**Figure 16.** *White corrugated plastic protector.*



**Figure 17.** *Spiral plastic stem protector.*



**Figure 18.** *Plastic tree shelters.*



**Figure 19.** *Chicken wire.*



**Figure 20.** *Welded wire fence.*



**Figure 21.** *Hardware cloth, 0.50".*



**Figure 22.** *UV treated rigid plastic mesh.*

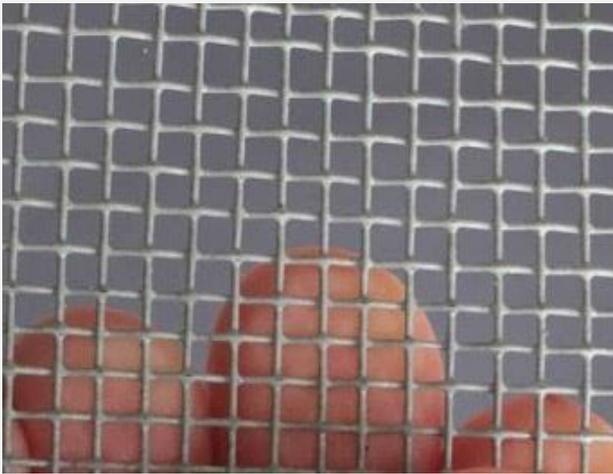


Figure 23. 0.25" hardware cloth.



Figure 24. Mulch ring.

to avoid your yard. Please note: when using Liquid Fence you may notice an odor, however, once it dries, the odor will not be noticeable to humans, but still very noticeable to animals.

**How it works...** Homeowners, gardeners, professional landscapers and commercial growers have discovered **Liquid Fence** stops deer and rabbit damage – **naturally!**

Unlike other deer and rabbit repellents that require the animals to browse to be effective, **Liquid Fence** works on scent, so deer and rabbits don't even have to take a bite to be repelled. Because the animals' natural aversion to this scent will never diminish, **Liquid Fence DOES NOT** have to be rotated with other repellent brands.

**Active Ingredients:** Putrescent Whole Egg Solids 1.07%, Garlic 0.37%, Sodium Lauryl Sulfate 0.14%, Potassium Sorbate 0.10%, Thyme Oil 0.003%

**Other Ingredients:** 98.317% (Water, Sodium Citrate, Sodium Benzoate, Citric Acid, Xanthan Gum)

**KEEP OUT OF REACH OF CHILDREN**

**CAUTIONARY INFORMATION:** This product may be harmful if swallowed. Avoid contact with eyes. If contact with eyes occurs, immediately flush with plenty of water. Seek medical attention if either occurs.

**STORAGE AND DISPOSAL:** Do not contaminate water, food or feed by storage or disposal. **STORAGE:** Store in original container, in a cool, dry area inaccessible to children and pets. Protect from heat and freezing. Store between 40° - 90°F. Keep containers closed tightly to prevent evaporation. If spillage occurs, dilute with water and flush away. **CONTAINER DISPOSAL:** Do not reuse empty container. Dispose of empty container as required by municipal or local laws.

Libellero-10-15-SC

retirarlo del cabezal del rociador hasta que esté completamente extendido. 3. Sin retirar la tapa, retire el adhesivo de la tapa que se levanta para descubrir la abertura al descubierto. 4. Incline la punta de la manguera roja de la tapa hasta que "encaje".

**Para recargar:** 1. Ajuste la bomba. 2. Para cebar el rociador, dirija la superficie que se va a tratar y varias veces para que el líquido cubra. Nota: Si mantiene el cabezal debajo del nivel del líquido, el rociador será más fácil. Después de usar, vuelva a la posición de apagado (X).

el producto. **ALMACENAR** el producto en un lugar fresco y seco. Manténgalo fuera de las mascotas. Protéjalo de temperaturas entre 4,4° C - 32,2° C. Manténgalo fuera de la evaporación. Si ocurre un derrame, elimínalo. **ELIMINACIÓN:** Vacíe el envase en un lugar adecuado. Deseche el envase en su área.

**SATISFACCIÓN GARANTIZADA**

Si por alguna razón usted no está satisfecho, Liquid Fence Co. le reembolsará el precio de venta original, o le reemplazará el producto. Liquid Fence Co. no es responsable por ningún daño, lesión o enfermedad. El reembolso o reemplazo es nuestra única obligación.

Figure 25. Olfactory options for protecting tree stems and foliage from animals.

**EVERY 30 DAYS**

This bottle will cover approximately 1,000 square feet.

**Ingredients**

**Active Ingredients**

Geraniol .....	1.00%
Castor Oil .....	.50%
Mint Oil .....	.35%

**Inert Ingredients**

Sodium Sulfate, Xanthan Gum, Kaolin, Water .....	98.15%
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**Total: 100.000%**

Patent #6,383,508

Messinas represents that this product is exempt from registration with the federal Environmental Protection Agency under FIFRA Section 25(b) regulations.

100% satisfied, Messina Wildlife will refund the original retail price or replace this product within 30 days of purchase. Messina Wildlife will not refund direct or indirect. Refund

RS-U-016

Figure 26. Olfactory options for protecting tree stems and foliage from animals.

## Part 5: The Tactics Are Only As Good As The Installation

### Timing...is everything

Timing is a balance between when the photosynthetic stems need sunlight and the common villains need food in their bellies...it's not a perfect science. Ideally, any stem protection device that restricts sunlight from reaching the stem would be removed by early May in the Upper Midwest. That may or may not coincide with the end of critter damage potential. You know when that date is for your part of the country. Don't restrict your actions to a calendar if you know that damage is likely after May 1. If you make a mistake and leave the protection on too long or remove it too soon, it's not the end of the world. Just don't do it again next year. That **WOULD** be the end of the world (to a tree hugger).

The flip side of the calendar is equally important...when does the seasonal damage usually occur? Sometimes, rabbits begin drooling over succulent cambium in early September, but often later. Adjust the installation of protection devices according to your local damage pressure. If you have difficulty predicting, avoid the stem protection tactics that restrict sunlight. Use the materials that protect yet don't deny the stems sunlight (e.g. chicken wire, hardware cloth). Lots of options fulfill lots of restrictions.

### It's a material world

Opaque stem protection should only be installed for the duration of the dormant season or impact season of the animal or spousal browse you're seeking to prevent, but rigid mesh stem protection may be left on all year. Stem protection, like wire fence and hardware cloth, should be removed before the stem out-grows the guard diameter, otherwise tree guards may girdle and kill a tree.

Tree shelters however are designed to remain on the tree year 'round and until the tree begins to grow taller than the height of the tube, which depending on the species and growing conditions, may take years.

Wire materials provide the best protection against animal damage while not blocking sunlight from reaching the photosynthetic bark. For this reason, as long as they are large enough, the wire cylinders may be left on year 'round. Depending on the size of the tree, the wire fencing may require stakes for support. Wire fencing should be inspected annually for effectiveness and removed before the fencing becomes too tight and constricts the tree's trunk. Avoid that "law of unintended consequences."

Mulching around trees is one of the lowest cost ways to improve tree survival and health. When properly applied, mulch can provide many benefits including improved soil moisture of the area around the tree's roots (Montague et al, 2007), increased root growth and density (Scharenbroch, 2009), insulation of tree roots from extreme temperature swings (Montague et al, 1998; Singer and Martin, 2008) and reduction in competition pressures from grasses and other plants. However the key benefit that the mulch ring provides here is protection from mechanical damage resulting from incidental mower and/or weed whip strikes.

## Part 6: Common FAQs

*I can probably just leave that opaque tree stem protection on the tree year 'round, right?*

### Myth

An interesting fact about trees that often goes overlooked is that the stems of young trees and shrubs contain photosynthetic tissue and require sunlight. This type of photosynthetic stem tissue has been shown to provide the tree many benefits including radial stem growth and new leaf development (Saveyn et al, 2010). Opaque tree stem protection (any device that restricts sunlight) prevents this stem photosynthesis from occurring, leading to a significant reduction in stem caliper development and bud formation (Figure 27). This can lead to decreased structural stability in the stem, and possibly stem failure during wind storms. It is for this reason that it is recommended that opaque tree stem protection be removed during the growing season. However, if you're using rigid mesh stem protection, wire fencing, or semi-transparent tree shelters, those may be left on all year.



**Figure 27.** Reduction of stem caliper growth caused by opaque stem protection left on for too long. Photo credit Stephan Papiz.

*Chicken wire pretty much excludes any animal damage to my trees, yes?*

### Myth.

Voles and pine mice can squeeze into very small spaces, including chicken wire, and do some massive damage to trees over the course of a winter. To that end, it's critically important that you identify what kind of damage is most likely to occur, and adjust the tactic to the villain.

*I think that bunnies and bambis are cute. How can they cause so much damage to trees?*

### Myth.

They are not cute. They are hungry villains. Keep them away from trees...don't encourage their presence. Don't feed them or encourage them to stay in the area of your trees.

*I've heard that hanging bars of soap from trees keep deer from feeding on them.*

### Myth.

Soap smells good. Deer like to smell good, especially young bucks. You need to promote foul-smelling odors.

*I've heard (detect a pattern?) that deer and beavers don't damage larger trees.*

**Myth.**

If you like that tree, if there are deer and beavers in the area, regardless of size, protect the stems from damage.

*Deer and rabbits prefer certain species.*

**Half Myth.**

There are some trees, oaks and elms and crabapples, that critters prefer, but there's one over-riding preference factor: store-bought trees. Nursery-grown trees have large energy reserves and nitrogen...that's what critters want. They will always go for store-bought over native species.

## **For More Information:**

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# About this publication

***TreeIQ - The MN Tree Inspector Quarterly* is a publication produced by the University of Minnesota in collaboration with agency partners. *TreeIQ* is a seasonal electronic newsletter devoted to providing timely technical information and community connections for Minnesota's Certified Tree Inspectors.**

**The University of Minnesota offers certification and recertification opportunities and proctors new certification exams at the certification workshops. For more information on the Tree Inspector program, the certification, and other frequently asked questions, please visit us at [www.mntreeinspector.com](http://www.mntreeinspector.com).**

**Contact [treesins@umn.edu](mailto:treesins@umn.edu) with any questions or submissions.**

*The Minnesota Certified Tree Inspector program was first implemented in 1974 and has since supported hundreds of participating communities around the state.*

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