

Spring 2018

TreeIQ

The Minnesota Tree Inspector Quarterly Newsletter



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Cover photo by Ryan Murphy, Department of Forest Resources, University of Minnesota. American elm bud breaking in greenhouse

Submit photos to treesins@umn.edu

Funding provided by a grant from the USDA Forest Service. This institution is an equal opportunity provider.

Tree Inspector News & Upcoming Events

2018 Certification Workshops

We are gearing up to host our annual certification workshops and exam. These workshops are a great way to get a nice refresher of the material before diving into the exam, which is offered at the end of the day. These workshops also qualify for full recertification. See the dates and download the registration form below, additional details can be found at www.mntreeinspector.com:

April 27, 2018 - Waseca, MN (Deadline to register: April 20)

May 3, 2018 - Oakdale, MN **FULL, Registration Closed**

May 11, 2018 - St. Louis Park Rec Center (Deadline to register: May 4)

May 18, 2018 - Cloquet Forestry Center (Deadline to register: May 11)

Doors open at 8:30 am, educational content begins at 9:00 am, exam will be administered no later than 3:15 pm

Light refreshments and snacks will be provided. We will break for lunch, however, lunch will not be provided. Please plan to bring a lunch or get something nearby.

[DOWNLOAD THE REGISTRATION FORM](#)

[DOWNLOAD THE TREE INSPECTOR STUDY GUIDE](#)

56th Annual Minnesota Shade Tree Short Course

Over 400 Tree Inspectors recertified this year at the MN Shade Tree Short Course. I'm sure many of you plan to be back next year. Was there anything you were hoping to learn about this year that wasn't talked about? Let us know so we can advocate for this content next year. Email treesins@umn.edu

Gravel Beds

Community Gravel Bed Inventory

Minnesota has emerged as one of the national leaders in using community gravel beds to affordably reforest their communities, special projects or host Arbor Day community tree sales. There is only one problem. We don't have a good directory that locates all of the gravel beds in Minnesota. With your help, we can correct that one, little deficiency.

People learn from each other, and that's our goal as we assemble this electronic directory. Each of you who have installed and used community gravel beds have learned something that you could share with another community or group, and vice versa. It's often those little "tricks" or innovations that makes a gravel bed even more successful.

The community gravel bed directory will be entirely electronic. The locator map will note your gravel bed, clicking on it will direct the user to a dedicated web page with the information and any photos you contribute to the web page. Contact information will be greatly appreciated for those communities or groups that wish to connect with you for any more information.

Below is a link to a google form which you can use to provide information. We appreciate your willingness to be part of this directory and the time you contribute to filling out the accompanying survey. If you have any further questions about the survey, the locator map and the individual community web pages, please feel free to contact one of us.

Respectfully yours,

Gary Johnson (johns054@umn.edu)

University of Minnesota - Urban Forestry Outreach Research and Extension

Daniel Yoder (yoder019@umn.edu)

University of Minnesota - Urban Forestry Outreach Research and Extension

**Click here and complete the survey to include
your community gravel bed in the database**

Link: <http://goo.gl/bULFrh>

TreeIQ Featured Tree Inspector, Spring 2018

Karl Mueller

Saint Paul, MN

In this issue of the TreeIQ we are happy to feature our good friend Karl Mueller. Karl was recently awarded the Practitioners Award of Excellence at the 2018 Minnesota Shade Tree Short Course for his outstanding work as an urban forester and his continued efforts to bring education about trees to students around the City of St. Paul. Read on to hear more from Karl.

Karl pictured here at Loveland Pass on the Continental Divide in Colorado



TIQ: How long have you been a MN Certified Tree Inspector?

I've been a proud tree inspector for 10 years, along with a 2-year stint while I was in college working as an Urban Forestry intern for St. Paul.

TIQ: What is your educational background?

I studied at the University of Minnesota and attained a degree in Urban and Community Forestry and a Forestry minor. I started out on the environmental policy and law track but quickly realized that wasn't for me. After taking the dendrology course, I discovered my path and decided to study urban forestry.

TreeIQ Featured Tree Inspector, Spring 2018

Karl Mueller, Saint Paul, MN

TIQ: How are Tree Inspectors utilized in the City of Saint Paul?

Our tree inspectors have a wide range of responsibilities. They essentially do the work of an urban forester: surveying the City's 200,000+ boulevard and park trees, identifying and marking dead and declining trees, and enforcing diseased tree ordinances on private property. They also respond to calls on boulevard trees, investigate insect, disease or other issues and educate residents.

TIQ: What are some challenges you or other Tree Inspectors in Saint Paul face?

It is surprising to me but did you know that there are some people who just downright don't like trees? It's true. And I've found it can be very difficult to change their opinion by sharing the multitude of benefits trees provide the community and environment. At times, it can seem like a waste of breath but we continue to attempt with a smile and a bit of humor.

TIQ: What have been a couple significant contributions that the Tree Inspector program can take credit for, either statewide or in your community?

The Tree Inspector program is valuable to St. Paul in that it provides a certification for our seasonal inspectors. Without it, they would not be given the authority to inspect trees independently. It's also a stepping stone to becoming a Certified Arborist, which requires minimum years of education and experience.

TIQ: Is there one Tree Inspector experience or memory you'd be willing to share?

During the summer several years ago, I got a call to inspect a large 40" dbh basswood on the boulevard of an arterial street. The residents of a townhome association asked to have some branches trimmed away from the building. Upon inspection, the basswood appeared healthy. Some branches were indeed brushing up against the building but I noticed a lot of suckering at the base. I grabbed my mallet and sounded the trunk which mimicked a bass drum. Totally hollow on all sides. So, I marked it for removal and shortly thereafter received a call from the residents passionately wanting to save the tree. Being sympathetic, I met with them and used an increment borer to show the tree having only 4-5 inches of sound wood. They reluctantly agreed and I didn't hear from them again until after the tree was removed - the stump revealed a hole of decay 3 feet below ground level and a hollow buttress root under the heaved sidewalk. Sad to see the tree go, but it was time.

TreeIQ Featured Tree Inspector, Spring 2018



Karl Mueller receiving the Practitioners Award of Excellence at the 2018 Minnesota Shade Tree Short Course with MnSTAC President Karen Zumach of Tree Trust (left) and MSA President Valerie McClannahan of MN DNR (right).

TIQ: Is there one interesting thing about yourself that most people may not be aware of that you'd like to share?

I am a big Minnesota Timberwolves fan. To the Cleveland Browns fans: I feel your pain.

TIQ: Thinking back on all of the courses, seminars, conference sessions that you have attended, is there any one that sticks in your mind that had an influence on you?

Established in 1854, St. Paul has many spectacular, old trees. In many cases, removal becomes the easy option when these trees begin to decline. Because of this, I am glad to see the rise in sessions about conservation arboriculture. Big trees in the urban forest are irreplaceable and I'm excited to learn more about how I can help to preserve more of them.

TIQ: How much longer do you plan on being a MN Tree Inspector?

At this point, I plan to be a life-long Tree Inspector and will help to encourage others to become one along the way.

Best Practices

Best Practices for Injections That Can Save Trees

Gary Johnson, University of Minnesota

Ben Johnson, ISA/BCMA Arborist

Theoretically, all injections of insecticides or fungicides into hardwood trees should work and the trees should be protected and saved. But that doesn't always happen...for a variety of reasons. This Best Practices guide addresses those instances of failures that can be traced back to applicator error and is based on manufacturers' recommendations and an interview with Ben Johnson, an International Society of Arboriculture (ISA) Board Certified Master Arborist (BCMA) with almost 20 years of experience injecting trees.



Traditional under pressure system for protection against EAB. Photo source: Purdue University Entomology department.

Names and rates of various insecticides and fungicides have been intentionally omitted to avoid any appearances of sponsorship. Always follow package directions when using insecticides and fungicides on landscape trees, no matter how much experience you have had with those products.

1. What are the basic types of injections?

- a. Macro Injections and Micro Injections.
- b. Fungicides, Insecticides and Nutrients.

Macro and Micro injections refer to the amount of water or carrier that is used to distribute the product throughout the tree.

Fungicides and at least one nutrient-based treatment for interveinal chlorosis are most commonly macro injected because the greater volume of water greatly assists the effective distribution of the product throughout the tree. Dutch elm disease, oak wilt, bur oak blight and sycamore anthracnose are examples where fungicides are macro-injected. Depending on the disease and the fungicide,

Best Practices: Injections

the volume of water can vary greatly. For instance, a mature American elm may require up to 75 gallons of water and fungicide to effectively protect the tree, while an oak wilt treatment may only use around five gallons of water.

Insecticides and some micro nutrients are most commonly micro-injected. Even with the lower volumes of water carrying the product, even distribution throughout the tree canopy is usually reliable.

2. Can the product or carrier ever accidentally harm the host tree or be insufficiently effective? The short answer is “yes!” It can be damaging or ineffective if the “dose” of product was incorrectly calculated or incorrectly diluted, if the carrier (water) was too alkaline, if the weather is too hot, dry or cold, if the tree was misidentified or if the tree isn’t actively transpiring (early spring or autumn).

The most common fungicide used for controlling Dutch elm disease relies on a carrier that is more acidic. If the available water source is too alkaline, then the water pH will need to be adjusted before the product can effectively go into solution.

Referencing that same product, red elms will suffer “phytotoxicity” (damage to living tissues including leaves) if the normal rate is injected into them. Red elms require using half-rates to avoid damage to the tree. Conversely, the most common product used to control bur oak blight can produce variable results on a tree by tree basis.



Fungicide injection into an American elm to prevent Dutch elm disease. Photo source: Province of Manitoba, Canada.

With one exception (see weather impacts), insecticides are rarely phytotoxic.

3. How are product “doses” calculated? They are usually based on the d.b.h. (trunk diameter measured at a distance of 4.5 feet above ground) and the package label directions. If a d.b.h. tape measure (a tape measure that automatically converts circumference to diameter) is not available, measure the circumference of the tree and divide that number by 3.14.

Best Practices: Injections

4. What impact does weather have on injection efficiency? Cool, breezy, sunny days with no precipitation are ideal. Humid, rainy, post-rain events (if the rain was heavy) can drastically slow down uptake. It's best to avoid those weather situations or allot a good amount of time for the product and water uptake.

Likewise, if weather conditions have been windy, sunny and droughty, the host tree should be irrigated well the day before the planned injection. The most common insecticide product micro-injected to control emerald ash borer can cause tissue damage if the weather is extremely dry. Simple solution? Irrigate the tree before treatment.

5. When does the injection season start and end? Generally, the injection season starts when the tree leaves have fully expanded...with a couple of exceptions. For emerald ash borer injections, start a little bit earlier (not quite full leaf expansion). For controlling bur oak blight, injections seems to be more effective if the treatment season starts shortly after bud break, quite a bit earlier than full leaf expansion.

The end of the season is triggered by shorter days and the beginning of fall color. Trees have almost shut down so there is very little product uptake going on at that time.



Pre-measured capsules for protecting ash against EAB. Photo source: Purdue University Entomology department.



Injection system for protecting oaks from oak wilt. Photo source: Purdue University Entomology department.

Best Practices: Injections

6. What other factors determine whether or not an injection is effective?

Point of Injection: It's most effective to drill the injection holes at the trunk flare whenever possible. Trunk flare tissue offers more area to drill holes, insert injection tees and therefore distribute the product more efficiently than if drilled and injected into the trunk. Plus, root flare tissue tends to seal over better and faster than trunk tissue, lessening the worry about introducing decay in the trunk.

Pressure: Products are delivered under pressure, approximately 10-15 p.s.i. (pounds per square inch). Less than that slows down the uptake process; more than that can result in tees constantly blowing out of the tree and subsequent loss of the product. Pressure can be supplied by electric pumps, a variety of hand pumps including bicycle tire pumps, or pressured product capsules.

Dull Drill Bits: Don't trust your own judgement on whether or not the twist drill bits are still sharp. Discard them after every five to ten trees (depending on the size of the trees and number of holes drilled). Dulled drill bits can glaze the drilled hole, slowing down the uptake of the product by the sapwood.

Injection Hole Depth and Diameter: Holes should be about $\frac{3}{4}$ inch deep. Don't go beyond the sapwood. The diameter of drilled holes ranges from $\frac{15}{64}$ " for macro injections of fungicides and as great as $\frac{3}{8}$ " for some insecticide micro injections.

Injection Hole Spacing: The optimum spacing for macro injections is between four and six (4-6") inches; for micro injections, between four and eight (4-8") inches, depending on the delivery equipment.

Injection Hole Angle: The optimum drilled hole angle is perpendicular (90 degree angle) to the trunk flare surface.

Injection Tee "blow-outs": Since the product and carrier are under pressure, it's easy for that pressure to blow-out the tees from the injection holes; or the flexible tubing that carries the product to the tees can separate from the tees. Trees will not take up the product (especially the fungicides) if they leak out into the soil. Tees should be checked for leaks every few minutes, more frequently in the beginning. If there is a leak, gently tap the tee with a rubber mallet back into the hole.

Also, avoid allowing air bubbles to form in the flexible tubing system if there is a blow-out. Let the air bubbles work their way out before reattaching the flexible tubing to the tees. If the flexible hose is frequently separating from the trees, shut off the system and correct the problem before restarting.

Best Practices: Injections

Summary

Effective fungicide, insecticide or nutrient injections into trees can be a safe and efficient method for getting product into a tree and avoiding any spray drift and collateral damage. However, there are opportunities at every turn to make mistakes and waste a lot of time, product and potentially savable trees. Follow these basic steps for a better success rate.

1. Hire pesticide applicators who are experienced in the tree injection processes.
2. Always follow manufacturer and product labels.
3. Make sure the tree is correctly identified and the d.b.h. is correctly calculated.
4. Be mindful of potential weather problems.
5. Use the right equipment and materials and keep them maintained.
6. Pay attention during the entire injection process. Don't install and then take a nap.
7. Always dispose of remaining products according to label directions.
8. Document everything.

Firewood

DNR Launches New Firewood Program

Val Cervenka, DNR forest health program coordinator

*Every tree inspector fondly remembers the wood ID portion of their certification exam... Learn about updates to the DNR Firewood Program. Republished here from the **Spring 2018 Forest Insect and Disease Newsletter**.*

New firewood regulations went into effect this year to keep invasive pests out of our state parks and state forests. The new rules simplify things for visitors while keeping our trees safe from forest pests that could kill them.

The law does away with the DNR's list of approved firewood vendors and instead gives the public several firewood options:



- You can purchase firewood from the DNR.
- You can purchase firewood from a vendor who verifies it is not ash and was harvested within the same county as the state park or state forest you're visiting (the wood must have a label showing the county of harvest).
- You may use firewood harvested in Minnesota that the Minnesota Department of Agriculture has certified to be insect-free.
- You may use firewood that is kiln-dried, clean (unpainted and unstained) dimensional lumber free of metal or foreign substances.
- You may use manufactured logs

Firewood

If you purchase firewood to bring onto DNR lands, be sure to get a receipt from the vendor that contains the vendor's name, contact information, the quantity of firewood, the county where the firewood was harvested, and date you purchased it. You will need this receipt to present to DNR staff if asked.

Are these rules really necessary?

Firewood is the number-one way invasive species travel from forest to forest, so it's the best place to target our prevention efforts. We don't want invasive insects hitching a ride on firewood, moving into our state parks and state forests and killing our trees.

If you grew up bringing firewood from home when you went camping, you're probably wondering what all the fuss is about now. The issue is emerald ash borer.

Back in the mid-2000s, emerald ash borer started killing millions of ash trees in states just east of Minnesota. But since the bug wasn't here yet, the Minnesota Department of Agriculture didn't issue a quarantine.

The DNR quickly realized the insects could infiltrate state lands anyway by traveling in on firewood, so in 2007, the legislature passed a law that allowed only "approved" firewood in State Parks. That meant any firewood used in state parks had to be kiln-dried dimensional lumber; certified (heat-treated and insect-free) by the Minnesota Department of Agriculture; sold by a DNR-approved vendor that harvested the wood in Minnesota within 100 miles of the state park where it would be burned (in 2009 that distance was reduced to 50 miles), or sold by the state park itself.

The DNR's Parks and Trails Division oversaw education and enforcement of the law, while the Forestry Division maintained a database of approved firewood vendors.

Why revise the rules?

Over the past decade, things have changed: the Minnesota Department of Agriculture quarantined counties for emerald ash borer and certified more firewood as heat-treated and free of insects—and the Forestry Division's approved-vendor database software became obsolete.

Firewood

Meantime, people had a hard time figuring out the difference between "DNR-approved" firewood and firewood "certified" by the Minnesota Department of Agriculture.

So, the DNR decided to look into whether the firewood law could be simplified. That led to this year's new firewood rules.

From now on, the Division of Parks and Trails will oversee the firewood program, since most firewood use on DNR lands happens in state parks, state recreation areas, and state forest campgrounds and day-use areas.

The next time you go camping, you can find approved firewood by logging onto [Firewood Scout](#). Just click on the map near your destination and the system will give you the names of several nearby firewood vendors.

We hope the new rules make things easier to find firewood and keep invasive pests out of our state parks and state forests.



Make sure to take a look at the Spring 2018 Forest Insect & Disease Newsletter from the MN DNR. There you can find articles on cold temperatures and insect mortality, brooms on spruce trees and thousand cankers disease.

Tree and Shrub Selection

Planting Trees and Shrubs for Pollinators

Have you been spending the past five months meticulously planning your planting list for 2018? Well it's time to stop fantasizing and get to it!

There are any number of good reasons to plant a given species, including planting for the benefit of our little pollinator friends.

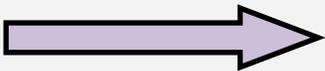
NATIVE TREES AND SHRUBS FOR POLLINATORS						BLOOM					
	BOTANICAL NAME	COMMON NAME	COLOR	MOISTURE	HEIGHT	APR	MAY	JUN	JUL	AUG	SEP
CANOPY TREES	<i>Acer rubrum</i>	Red Maple	red/yellow	m	to 95 ft						
	<i>Acer saccharum</i>	Sugar Maple	yellow	m	to 100 ft						
	<i>Aesculus glabra</i>	Ohio Buckeye	yellow	m	to 35 ft						
	<i>Gleditsia triacanthos</i>	Honey Locust	yellow	m, d	to 45 ft						
	<i>Gymnocladus dioicus</i>	Kentucky Coffeetree	white	w, m	to 75 ft						
	<i>Prunus serotina</i>	Black Cherry	white	m, d	to 100 ft						
	<i>Tilia americana</i>	American Basswood	white	m	to 95 ft						

From *Native Trees and Shrubs for Pollinators* by Heather Holm

One thing to consider when planting for pollinator health, is the fact that many plant species bloom during a short and specific time during the growing season. Therefore, consider planting landscapes with a diversity of plants with non-overlapping bloom times.

The above image is taken from a document put together by Heather Holm (www.pollinatorsnativeplants.com). The list Heather has put together should get you buzzing with ideas for selecting trees and shrubs that are pollinator pleasers. And if you want to dig deeper, check out her books *Pollinators of Native Plants* and *Bees: An Identification and Native Plant Forage Guide*.

Click Here to Check out the plant list:
Native Trees and Shrubs for Pollinators



NATIVE TREES AND SHRUBS FOR POLLINATORS																			
BOTANICAL NAME	COMMON NAME	COLOR	MOISTURE	HEIGHT	BLOOM						OTHER								
					APR	MAY	JUN	JUL	AUG	SEP									
<i>Acer rubrum</i>	Red Maple	red/yellow	m	to 95 ft															
<i>Acer saccharum</i>	Sugar Maple	yellow	m	to 100 ft															
<i>Aesculus glabra</i>	Ohio Buckeye	yellow	m	to 35 ft															
<i>Gleditsia triacanthos</i>	Honey Locust	yellow	m, d	to 45 ft															
<i>Gymnocladus dioicus</i>	Kentucky Coffeetree	white	w, m	to 75 ft															
<i>Prunus serotina</i>	Black Cherry	white	m, d	to 100 ft															
<i>Tilia americana</i>	American Basswood	white	m	to 95 ft															

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.

Contact 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.

The Tree Inspector Program is administered by the Minnesota Department of Natural Resources in partnership with the University of Minnesota's Forestry Department.

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