



Minnesota Woodlands

MFA: an organization of, by and for Minnesota's private woodland owners and friends.

www.MinnesotaForestry.org

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MFA Newsletter
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 The Minnesota Woodlands newsletter is published by the Minnesota Forestry Association.

MFA Board Meetings
 Cambridge DNR Office, 10 am - 3 pm
 • October 10, 2017
 Conference Calls
 8 - 9 am
 • August 8, 2017
 • September 12, 2017
 • November 14, 2017
 • December 12, 2017

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The Seedling Issue

This issue is devoted to seedlings because the DNR Forest Nursery issues its price list for 2018 in August.

This issue also has two articles on seedling protectors, one for conifers and one for hardwoods. Both are written by Dean Makey, the expert behind MFA's **Forester Phone Line**. Under this free service, MFA members can call our office (218-879-5100) to set up a call with Dean.

Cost Share. John Carlson, Coordinator of the Private Forest Management Program, said the cost share year started in July with a fund total that is a little less than last year. Carlson said some areas have a backlog of landowners who are interested in cost-share projects. The funds for these areas could be depleted by fall. Funds in other areas may last until spring.

RECOMMENDATION: *If you are interested in applying for cost share funds, or have questions, call your nearest DNR Forestry Office TODAY!*



Dean Makey



Badoura State Forest Nursery

by Kristina Somes, Nursery Supervisor

The Minnesota State Forest Nursery faced some unpredictable challenges as well as some welcomed success this past season. Spring seedling availability was affected by the *Dipodia* fungus, mainly impacting the production of red pine seedlings. While the causes and source of the infection are still under investigation, we are working diligently with Forest Health staff to test and treat seedlings for the fungus to ensure healthy, productive red pine seedlings.

This summer, the nursery staff has been busy planting, irrigating, fertilizing, applying fungicide, weeding (manual, mechanical, and chemical) to produce around 5 million seedlings for distribution in the spring of 2018.

If you have questions or are interested in learning more about the nursery please call 800-657-3767 or email mnforestnursery.dnr@state.mn.us. To order seedlings for next spring, Google *Minnesota State Forest Nursery Order Form*. Order early because some sizes and species sell out quickly!

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Creature Feature

By Jodie Provost, MN DNR Private Land Habitat Specialist

Four-toed Salamander (*Hemidactylum scutatum*) Tougher than a Dinosaur!

The four-toed salamander is one of eight salamander species inhabiting Minnesota. It is unique in multiple ways. The first is the four toes on its hind feet. Most other Minnesota salamanders have five toes in back. All have four toes in front. It is 3-5 inches long, red-brown with dark flecks on its sides, has a bright white belly with black mottling, and an obvious tail constriction. First discovered in Minnesota in Itasca County in 1994, it is now also known in Aitkin, St. Louis, Carlton, Pine and Mille Lacs counties.

Forest/Wetland Mixer This native is distributed widely in disjunct and isolated populations across eastern North America's mature, upland, deciduous or deciduous-coniferous forests intermixed with bogs, alder swamps, vernal ponds or other fishless wetlands (fish eat salamanders and compete with them for food). Belonging to a family of lungless salamanders, four-toed adults are limited to damp habitats and moist weather so oxygen and carbon dioxide can dissolve and move across their skin – another unique feature. Mature closed-canopy forests with temporary and seasonal wetlands afford the shade, temperature, moisture, organic soils, woody debris, moss, suitable nesting and overwintering places, and habitat corridors they need to survive and thrive.



Tougher Than a Dinosaur

In Minnesota, the four-toed salamander is listed as a species of special concern due to its tendency to occur in small isolated colonies and thus be vulnerable to catastrophic events or drastic habitat changes. However, it seems they coexisted with dinosaurs for 75 million years and survived the mass dinosaur extinction. Its genus is apparently the oldest of all lungless salamanders, and since four-toeds are the only species in it, they are the sole representative of many millions of years of evolution!

It's a Complex Life The life cycle of a four-toed salamander is a little complex. Like most amphibians, it lives a double life as shell-less eggs and gilled larvae in water, then as adults on land. The cycle begins in fall when males and females court in an intriguing 'tail-straddle walk' prior to the male depositing sperm that the female picks up with her cloaca. In late fall, they gather to winter in below-ground hideaways. Females laden with eggs emerge in late April to early May, journeying to wetlands to lay about 30 eggs, or communally lay hundreds of eggs, at land's edge in moss hummocks, grass clumps, under bark, the base of alders or other protected sites.

Beneficial Bacteria At least one female stays with each nest for four to six weeks until larvae emerge. Her main role seems to be protection of the embryos from fungal pathogens, not predators. Microflora living on the female's skin transmit valuable bacteria to the embryos that offer antibodies and natural immunity to chytrid fungus. This fungus has devastated and caused extinction for other amphibian species. The eggs are believed to have a toxin that makes them distasteful to predators.

Toxins and Trick Tails After four-toed larvae emerge, they wriggle and plop into the water to feed on zooplankton and other small aquatic invertebrates. The optimal water depth is roughly 20 inches to give sufficient moisture during the six weeks they metamorphose, yet be too shallow and temporary for fish to inhabit. As 'mini adults', they climb onto land and disperse two to three weeks later. At about two years of age they can reproduce. Adults eat small invertebrates such as ticks, ants, beetles, spiders, snails and worms. When they become prey, they secrete toxins, and, unlike most other species, can detach their tail at will, even before grabbed - yet another amazing feature! These exceptional creatures can live at least nine years.

Helping Habitat Hand To give these cool creatures a hand, forest landowners who know or think they may be providing a home for them or other salamanders can help by using the following conservation actions: First, as always encouraged, we can keep our forests in large, un-fragmented, un-developed, native, diverse, healthy patches. Next, we can minimize roads and trails so they are less likely to be barriers to four-toed movement; locate roads and trails on uplands to prevent run-off and erosion into wetlands and streams; eliminate use of chemicals such as herbicides and insecticides; and protect known and potential nesting sites by keeping fish out. Finally, when conducting timber harvest, we can protect nesting sites by creating a no- or light-harvest buffer around them (50 feet of no harvest suggested, plus an additional 50-150 feet with 80% residual basal cover left); harvest between October 1 to March 15 to protect migrating and dispersing four-toeds; harvest and do prep (such as trail establishment) on frozen ground to reduce soil compaction and rutting (protects burrows); assess and mark forests in spring and early summer when nesting sites are most identifiable; and distribute slash across the site to provide woody debris and prevent large piles from blocking four-toed movements. Our thoughtful practices will also benefit other forest wildlife needing similar habitats.

Report Sightings Because they are a rare species in Minnesota, please report four-toed salamander sightings to MN DNR by phone (Minnesota Biological Survey's animal report line at 1-888-345-1730) or e-mail (nongame.dnr@state.mn.us, subject line of "Four-toed Salamander Report"). The date, location, observer, and contact information are important, and photos are helpful. To support amphibian research and conservation globally and in Minnesota, considering recording your observations at HerpMapper (www.herpMapper.org). To learn more, the guide "Amphibians and Reptiles in Minnesota" by John Moriarty and Carol Hall (2014) is an excellent resource. It is available for \$39.95 from Amazon or the University of Minnesota Press.

Thank you to Minnesota amphibian experts who reviewed and provided information for this article: Carol Hall, Erica Hoaglund, Jeff LeClere, and Luke Groff of MN DNR, and Chris Smith of MN DOT.

What if a friend, guest, hunter or trespasser is injured on your land?

Will your homeowners' insurance cover the costs? Maybe yes, but maybe no.

Insurance through the National Woodland Owners' Association is so economical, every woodland owner should have it! The cost for combined Woodland and Hunting Lease Liability Insurance is **just 40 cents per acre!** To see an application for the insurance, **Google National Woodland Owners Association.** For questions about the insurance, call the agent, Outdoor Underwriters, Inc. at 866-961-4101.



MFA's No Trespassing signs exactly meet the requirements of Minnesota's law. Made of heavy plastic, they will last outdoors for years, particularly if mounted on a plywood backing. To be perfectly legal, the signs should be signed and dated each year. Conveniently, the ink from a Sharpie pen wears off after a few months so they can be re-signed and dated year after year.

The signs are \$2.50 each plus \$5.00 for shipping the lot. Send your check to:

MFA, Suite 7, 1111 Cloquet Av., Cloquet MN 55720

Thinking of harvesting timber from your land?

Call Before You Cut

You will be sent a packet of information with no cost or obligation to you.

218-879-5100

Protecting white pine and other seedlings from deer browsing with

Budcapping, repellants, or ...?

by Dean Makey

I have observed the use of different deer browse protection methods for conifers on public and private lands for many years. In recent years, I have personally performed this treatment on School Forest tree plantings near Brainerd. I have tried the methods of bud capping, repellents, and seedling protection tubes, also called "tree shelters." Although they are more expensive and require a lot of maintenance for several years, I feel the seedling protection tubes are most effective. The tubes are used for protecting mostly the pines. I have used them to protect balsam fir and northern white cedar when they are small seedlings.

Tips for Using Tree Seedling Protection Tubes to Prevent Animal Damage on Conifers

1. Use a product called "**Rigid Seedling Protector Tube.**" It is available for purchase from Forestry Suppliers or Ben Meadows. This is a plastic, mesh tube, not a solid-sided tube.



Rigid Seedling Protector Tubes with bamboo stakes.

2. **Diameter of tube.** Choose a large diameter tube, either 4" or 5". It is much easier to work with when placing the tube over the tree seedling. The larger diameter opening provides a better chance for the seedling to grow out the top of the tube and not through the side.

You will be adjusting the tubes on the seedlings for several years. As the seedling grows bigger, the wider diameter tube is easier to work with while placing the tube over the top of the seedling.

3. **Length of tube.** I feel 18" of tube length is sufficient for good protection of the leader and a whirl or two of branches. You can buy the tubes in the 18" length.

You could also buy the tubes in the 36" length and cut the tubes in half to make two out of one. It may be cheaper this way, but it is a lot of work cutting hundreds (thousands) of tubes!

4. **Bamboo stakes.** You will need a bamboo stake for each tube to hold it up straight. Use a stake with at least 4 feet of length. You will be adjusting/lifting the tube higher each fall to cover the top leader of the seedling

as it grows in height. The stakes will begin to rot with time and will shorten over several years of use. They will even break in the middle, sometimes making them too short for use. A larger diameter stake may not rot as easily, extending their time for use.

5. **First year installation of tubes.** If you have planted in an open field situation with little vegetative competition where the seedlings are easy to see, install the tubes during the fall of the first year. Complete the fall installation by November 1.

If you have planted in a cut over situation where you have shrub competition, I suggest installing the tubes soon after planting in the spring of the first year. This will make it easier to find the seedlings when you need to perform treatments in the future, such as release work. The tubes on the young seedlings will help to prevent the seedlings from being "accidentally" cut when completing the release cutting.

Weave the bamboo stake in and out of the side of the tube two or three times. Carefully, place the tube over the seedling so it is centered in the tube.

A technique

I use is to slide the tube with stake over my lower arm, grab the seedling with that hand carefully to protect the buds, and slide the seedling into the tube while lowering the tube to the ground. Insert the stake well into the soil, so it is firm and secure. Inserting in wet soil is easier than dry, hard soil. Make sure the tube is standing straight.



The seedling centered inside the tube.

6. **First and second year of tube maintenance.** Usually, the seedling does not grow out of the tree shelter during the first, and sometimes, the second year, unless you begin with large stock. Ideally, you could take the tube off the seedling during the growing season, so it can grow freely. Then, reinstall the tube in the fall for winter protection. This takes a lot of work if you have many trees to maintain. If you do this, just take the tube off and lay it on the ground right next to the seedling, making it easy to find and reinstall in the fall.

Instead, I suggest leaving the tube on the seedling over the summer. Make sure the tube is standing straight so the seedling can grow straight. If the seedling has grown taller than the tube length, just slide the tube down the stake to ground level in the spring. This allows the top of the seedling to be out of the tube, so the top can grow freely. If you cannot do this "sliding down" of the tube, take the whole tube off for the summer and reinstall in the fall.

7. **Annual tube maintenance.** In the spring, either take the tubes completely off, or adjust them by sliding the tubes down the stake to let the top of the seedling grow freely during the summer. Leaving the stake and tube on the seedling, even if lowered, can help a seedling stand upright if it has a leaning problem.



The tube has been slid down to the ground for the summer, leaving the top of the tree to grow freely.

8. When doing this, **be extremely careful not to accidentally break off the buds!** If you break them off, you are defeating the whole purpose of this protection. It would be as if the deer were eating the buds! White pine buds are especially tender and break off easily. Be careful!

In the fall, by November 1, come back through the planting and reinstall the tubes or adjust the tube height on the seedling to cover the top leader. **Again, be careful not to break off the buds.** When doing this, reinsert the stakes into the ground so they are secure. They tend to loosen during the summer with movement of the seedling in the wind. You may have to replace a short stake with a taller one. Replacement is common. Short stakes can be reused on first and second year plantings.

These protection tubes for conifers need a lot of maintenance, but I feel they are effective for deer browse prevention. I usually recommend leaving them on until you feel the deer will not browse on the leader any more. I've found protection of red pine is not needed as long as it is for white pine and jack pine. I've seen the deer browse on small balsam fir and used the tubes for a couple of years of protection. If you can get the leader out



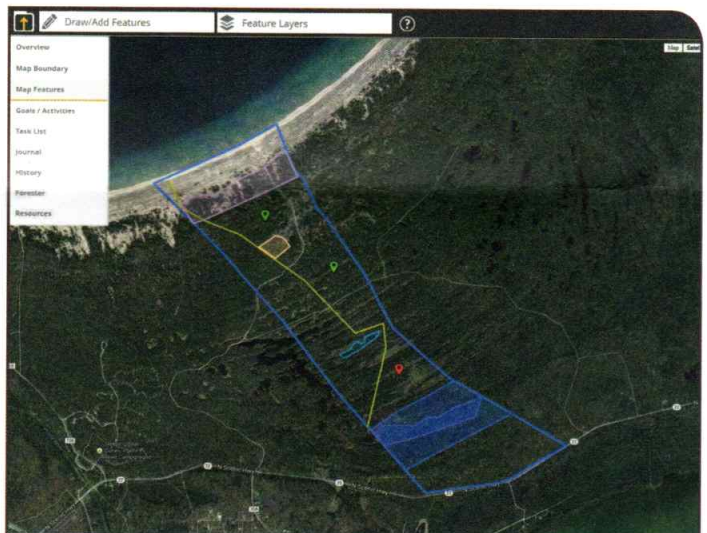
To grow northern white cedar in high deer browsing areas, a wire cage is needed.

of danger, you can stop the protection efforts.

In some situations, such as high deer densities or trying to establish northern white cedar, even the Rigid Seedling Protector Tubes are not enough. In these cases, purchasing **heavy woven wire and constructing large diameter cages, several feet in height, is needed.** The cages are secured with a heavy stake, such as rebar. Another extreme measure is to construct a deer enclosure fence around an area to be protected. Both of these methods are more expensive, yet are sometimes needed to protect trees from deer browsing.

Finally, government agencies, like the Minnesota DNR Forestry or your local Soil and Water Conservation District, may have funds available to help fund your protection efforts. Contact them and ask about "cost sharing" assistance for your project.

Trees are hard to establish and grow. Animals, insects, diseases, competition, and drought are their adversaries. It's not easy, but a nice stand of established trees has many rewards!



Have You Tried MyLandPlan?

The American Forest Foundation has a couple of subsidiaries. One is the familiar Tree Farm System. Another is **MyLandPlan**, a free mapping tool with which you can draw a customized map of your land. On it you can draw in trails and other features. Check it out at MyLandPlan.org/Signup.

For MFA members, the two best online sources of woodland information are the MFA website at www.minnesotaforestry.org, and the University of Minnesota Extension Forestry website at www.myminnisotawoods.umn.edu.

Tree Tubes for Oak and Other Hardwood Seedlings

By Dean Makey

Using protection tubes is a common practice to protect hardwood tree seedlings from animal damage. I do not have much personal experience with implementing this practice, so for the purpose of writing this article, I have interviewed landowners and foresters who do have experience and have done online research of literature related to this topic. I conducted a search on the words, "Hardwood Tree Seedlings – Protection," which resulted in many sources of information. These protection tubes are known by other names, such as tree tubes or tree shelters.

The use of protection tubes on hardwood seedlings has many purposes:

- to prevent browsing damage by deer
- to prevent feeding and girdling damage by rodents (mice, voles, rabbits)
- to mark the trees for future treatments
- to protect the seedling during herbicide spraying or mowing
- to prevent damage to sapling stems from deer antler rubbing
- the tubes are also thought to improve the growth of tree seedlings by creating a "greenhouse effect." Altering the seedling growing conditions of temperature and humidity seems to result in faster, initial height growth.

Today, the **tubes** are made of light, stabilized polypropylene or polyethylene materials. The tubes are "translucent," allowing certain sunlight to penetrate the tube sides and reach the tree seedling for growth. The tubes used for hardwoods are solid-sided, not the mesh type as used for conifers. Many of the solid-sided tubes are perforated, allowing for air movement within the tube, which helps to regulate temperature and moisture within the tube. The tubes were once marketed as "photo-degradable" in five to eight years, but they last much longer; in some cases, they will need to be removed from the tree. Some tubes come as a sheet of plastic material which needs to be rolled into a tube shape and installed. These "wrap around" tubes could be reused. The tubes come in different sizes and colors. There are many tube products available to choose from. Plantra Grow Tubes, Tree Pro Grow Tubes, and Tubex Tree Tubes are just a few of the trade names.



These tree tubes are protecting orchard trees.

Stakes are needed to support and hold the protection tubes upright and straight for **many years**. Stakes should be nearly as long as the tube. They need to be pushed or pounded into the ground, so they should have a point at one end. Possible materials for stakes include bamboo, naturally durable or treated wood, fiberglass rods, rebar, PVC pipe, electrical conduit, or specialized staking products. The stakes must remain attached to and support the tube for several years, so durability of the stake is important.



The stakes should be sturdy because they have to last several years. This tube has ventilation holes which help the seedlings to harden off at the end of the growing season.

The stakes should be installed before or immediately after the tree seedlings are planted. Install the stake within a few inches of the planted seedling, so the tube will be centered around the seedling. Soon after, place the tube over the seedling and push the tube into the soil. Tie the tube to the stake with fasteners.

Tips for Purchasing Materials and for Installation:

- To protect from deer browsing damage, use tubes that are 5 or 6 feet in height.
- White colored tubes may let in more sunlight than tan or blue tubes.
- "Wrap around" tubes may be reused, while non-wrap around tubes will probably need to be cut for removal. Wrap around tubes may be cheaper, but will need more work to shape the material into tubes.
- Some tubes come with "pre-threaded" fasteners, saving time and effort.
- Use a perforated or ventilated tube. With the old style of unventilated tubes, seedlings had a higher chance of shoot dieback in the fall. Insufficient "hardening off" of the seedling was occurring due to the shelters acting as a greenhouse, keeping the seedlings actively growing well into the fall.

Today, many of the shelters come with perforations and ventilation built into the tube. This allows the conditions inside the tube to match the outside temperatures, allowing the seedling to harden off naturally, preparing it for winter conditions.

- The bottom of the tube should not be perforated to protect a small seedling from damage by herbicide spraying or mowing.
- Stake length should be long enough to allow at least 1 foot to be driven into the ground. The top of the stake should

reach about 6 inches above the top fastener. The height of the driven stake should be lower than the top of the tube.

- Tubes should be pushed into the soil about 1 – 2 inches to prevent small rodents from entering the tube.
- Secure the tube to the stake several times using a “zip-tie” type fastener.
- Not all seedlings may need to be protected, depending on your management goals. Choose the taller hardwood seedlings to be protected.

Birds sometimes fall into the tubes, resulting in the death of both the bird and the seedling. The use of a bird **mesh net** placed over the top of the tube will prevent this problem. However, the net must be removed before the tree’s terminal bud reaches the top of the tube or the terminal bud will grow in corkscrew fashion under the net. When checking tubes in the spring, remove any mesh net from tubes in which the terminal bud is within a foot of the top.

Maintenance of the protection tubes is needed for many years following installation. They should be checked at least every spring before growing starts to make sure the tubes are standing straight and are well secured.

Control of competing vegetation is an important part of tree seedling survival and growth. It is recommended to eliminate vegetation from 2 – 3 feet around the seedling base. This could be done with herbicide application. Be careful with the herbicide so drift will not damage the seedling. A non-perforated lower part of the tube will help to prevent drift damage. Elimination and removal of vegetation around the base of the seedling will also remove vole and mice habitat, lessening the chance of damage from these rodents.

The tubes will need to be left on the tree stem well after the tree grows out of the top of the tube. The tree will still need the support of the tube until it grows strong enough to support the developing tree crown.

Finally, the **establishing of tree seedlings is hard work**. Many factors need to be considered. Protection of the seedling is important. Tree protection tubes are expensive and require a lot of work, but they help the seedling grow faster in the early part of its life and protect it from damages by animals. They help to ensure the tree seedling’s survivability and development.

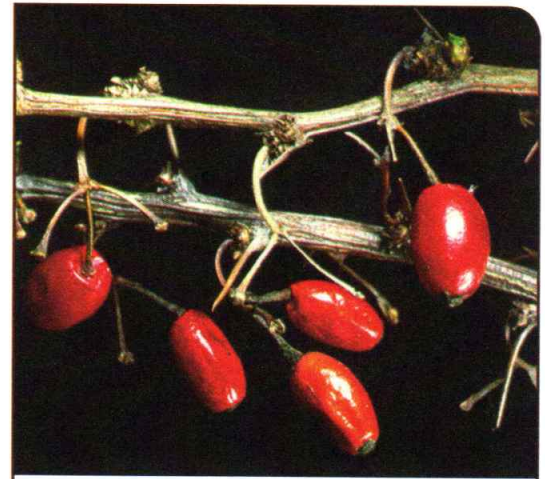
One of the best publications I found during my literature research is ***Tree Shelters for Hardwood Plantings*** by the Iowa State University Extension Service. To find it, either Google the title or go to our web site, MinnesotaForestry.org and find a link at the top of our home page.



If bird mesh is used to prevent birds from falling into the tube, the mesh must be removed well before the seedling reaches the top of the tube or it will grow in corkscrew fashion under the mesh.



The seedling is half way up the tube.



Another Ornamental Plant Gone Bad

A large infestation of Japanese Barberry was discovered recently outside the City of Wabasha. This sharp, spine-covered shrub forms a natural fence that even deer and cattle won’t cross. Stands can be so thick that they create a habitat under which deer ticks thrive and native plants are displaced.

Red berries are formed in late summer or fall. Birds eat the berries and disperse the seeds.

Photo credit: Barry Rice, sarracenia.com, Bugwood.org

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Upcoming Events

Find more events, and more information on these events, at the MFA website, www.MinnesotaForestry.org or by calling MFA at 218-879-5100.

WORM WATCHERS' TRAINING

Wednesday, September 23, 10 am - 2 pm

Learn about earthworm biology and the Great Lakes Worm Watch. The training will be held both indoors and outdoors. Cost: \$35.00. Questions or comments? Contact Stephan Carlson at carls009@umn.edu or call 612-624-8186.

CHAINSAW CLASS

Thursday, September 28, Cloquet.

This class is sponsored by the Minnesota Logger Education Program. Class size is limited to 12. Registration is \$175. For more information, call MLEP at 218-879-5633.

MFA'S ANNUAL MEETING AND FIELD DAY

Friday & Saturday, October 13 & 14. See the flyer enclosed and on MFA's website, MinnesotaForestry.org.

WEBINARS: Tuesdays from 12 noon to 1 pm.

ECOLOGICAL FORESTRY TO PROMOTE HEALTHY FORESTS, August 15

TRANSITIONING BLACK ASH WETLANDS TO AN EAB-INFESTED FUTURE, October 17

EVEN THE HEALTHIEST TREES HARBOR FUNGI THAT WILL EVENTUALLY KILL THEM, November 21

For information on these and other webinars, and to register, Google 2017 Forestry Webinar Series.

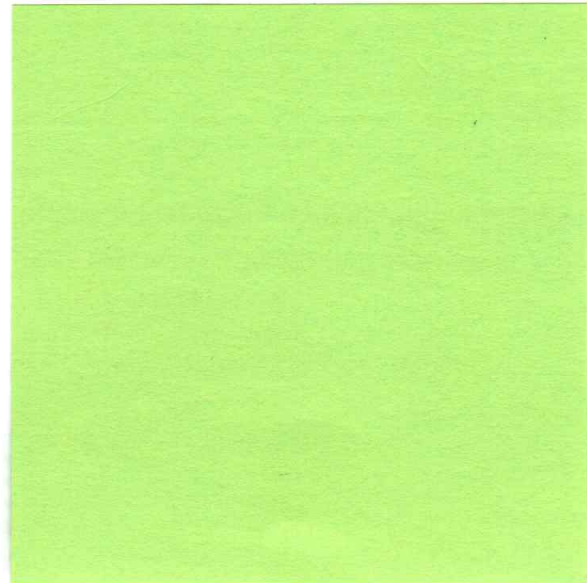


Minnesota Forestry Association

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Change Service Requested



News from North Central Reforestation

Minnesota's leading producer of containerized seedlings

by Michelle Olson

We've had an eventful summer here at North Central Reforestation. After an incredibly busy spring shipping season in which many species were sold out, we were settling into the summer routine of cleaning, planting, weeding, etc. Generally, we can slow down this time of year and enjoy working at this beautiful Otter Tail County site. However, two storms on June 13 brought us over 4" of rain, wind and some major building damage. It was slow going even getting to the greenhouses in the morning with three trees down across the township road. When we got there, we were met with lots of surprises! The end walls of two shade houses were ripped off and lying flat on the ground, dozens of panels were missing from the big greenhouse, the roof skylight was missing from the shed, and the list goes on.

The good, no, GREAT news was that there was minimal damage to the tree seedlings! That

was truly a miracle when we look at the building damage and destruction! We're slowly getting the buildings back to normal and settling into the rhythms of summer again. Our goal is to have all repair work completed later this fall.

That reminds me that we do a lot of fall shipping. **Here in Minnesota, if you have good soil moisture going into September, that is a great time to plant trees.** If you decide not to plant then, think about at least reserving your spring 2018 trees. We have been selling out of many popular species early, and since we have been growing to capacity, we suggest early orders to avoid disappointment. Enjoy the summer!

