



Nursery News

January 2013



WELCOME to the first edition of *Nursery News*, a Wisconsin Department of Natural Resources' state nursery publication. Published bi-annually in January and July, the intent of the newsletter is to keep individuals abreast and updated on reforestation topics. You are encouraged to provide feedback and article suggestions.

We may have been a little over zealous with articles in our debut; future publications most likely will be shorter in length.



***NEW 2013 Trucking Procedure**

Beginning spring 2013, the state nursery program will contract trucking services to deliver **private stock orders** to most counties; locally arranged transportation

will be discontinued. One drop off location will be designated in each county. Customers who opt for this service will be charged \$8.00 per 1,000 seedlings or packet; 4th grade Arbor Day orders and Registered School Forest orders are exempt from this charge. Customers, however, may continue to personally pick up orders at one of the three state nurseries in Boscobel, Wisconsin Rapids or Hayward.

Nursery staff consulted with DNR foresters across the state to ascertain interest and to determine a reasonable fee prior to implementing this change. Input from the department's legal counsel also was sought. The intent is to ensure proper storage during transportation, increase efficiencies and lower costs to customers. If you have questions, please contact your DNR [forester](#) or [nursery manager](#).



Drought, Dead Trees...Grants Available

By Jeremiah Auer

Asst. Manager, Griffith State Nursery, Wisconsin Rapids

Summer 2012 saw a majority of the southern 2/3 of Wisconsin suffer through an oppressive drought. Clay soils baked hard as pottery and sandy soils turned into powder. Crops, well watered in their early development, slowly withered. Grazing land turned brown. Even the toughest weeds wilted under the onslaught of the summer sun. Late season rains provided relief from the fierce drought but came too late for some vegetation. Landowners with tree planting projects were not immune to these meteorological challenges.

In the most severe areas, some plantings as old as four years suffered tree mortality. Some trees species, especially

hardwoods, will have leaves turn brown, curl and fall off in response to stress. It is possible for them to recover. However, when conifers turn brown, they rarely pull through.

The Division of Forestry announced that landowners in 49 Wisconsin counties who **lost 25% or more** of the trees planted between 2008 and 2012 due to the 2012 drought may be eligible to receive a grant for replanting the drought-killed trees through the Wisconsin Forest Landowner Grant Program (WFLGP). In FY13, \$100,000 was set aside for state emergency grants; approximately \$15,000 remains available, however, if demands for funds continue to be high, additional funding may be set aside in fiscal year 2014.

Contact your local DNR forester for assistance. Click [here](#) to learn more about financial options available to landowners.



Contract Tree Planting Administration

By Duran Bjorklund

Washburn County Forestry Department

Long term success of reforestation projects comes with experience and hard work.

Arrange a **pre-planting meeting** on site with the planting crew foreman. We demonstrate to the foreman how we want the planting hole formed (a square or "U" shaped bottom not a "V" shaped bottom). We show him how we want the air pocket in the bottom of the hole packed with the planting bar along with how we want the packing to take place at the surface of the soil. We demonstrate to the foreman how we want the roots put in the planting hole, no "J", "L" or "U" rooted patterns, and how top lateral roots are to be placed in the hole. We show the foreman how we want tree root collars placed at the soil surface, not too deep or too shallow. Spacing between planted trees also is reviewed as it seems difficult to get planters out of the routines they have used during the previous few weeks. The foreman then spends 10-15 minutes with his crew relaying the planting specs he was just demonstrated.

Once the planters get going, we have 2-3 foresters on site field checking them (see planter inspection sheet below). Typically the forester measures the distance between ten trees down a planted row pulling and inspecting every tree above ground. Also, the first tree in the 10th row is dug up to inspect below ground criteria.

It is very important to **field check** the planting crew right away because some planters will not be meeting the planting specifications. It's very important to determine which planters are not meeting the requirements and inform the crew foreman. A good crew foreman will be on site and will inform the planters how to correct what they are doing wrong. Do not have a planting crew foreman who also plants with his crew as you tend to lose quality control for those sites.

Washburn County has found it more efficient to **purchase sorted stock** from the nurseries. This saves time for the planters loading their bags along with avoiding decisions on which trees to cull or not. It also saves man hours for the county not to have one person at the tree distribution site watching the planters root pruning. Planters will prune a root as short as what they think they can get away with!

Washburn County Forest Planter Inspection Sheet (____% sample)

Loose trees: Described in planting contract. Pulling on two needles and not having the seedling loosen or pull out. The needles will pull out of the seedling.

Poor packing: This is associated with the planter stepping on the seedling during packing.

Exposed roots, shallow & deep: The forester uses his hand to gently brush around the stem of the seedling and makes an above ground observation. If it appears there is a lateral root exposed, you have to pull on it to determine it is from the seedling or associated vegetation, the seedling moves, it is attached.

"J" root & air pockets: The seedling should be dug up on the opposite side of where the planter packet it above ground. This allows you to shake your tile shovel back and forth flat on the ground dispersing the soil around the roots revealing the quality of the planting.

For more information about contract tree planting administration or to receive a copy of Washburn County's tree planting contract, contact Duran Bjorklund at 715-635-4490.



Tree Seedlings for Sale

Quality nursery stock is available for [purchase](#) from the DNR's state nursery program. County forest partners are eligible for graded and root pruned stock at a 50% price reduction. Private landowners may be eligible for up to 50% [cost-sharing](#) for site preparation and tree planting. Contact your local DNR [forester](#).



Carey Skerven
Nursery Office Associate



Improved Jack Pine Seedlings Available

The state nursery plans to sow improved jack pine seed this spring with the goal of accepting orders beginning October 2013 for spring 2014 distribution. Customers can expect an overall volume increase of about 20% from these seedlings in the near future. The percentage should increase as genetic improvements continue. If you are interested in receiving a technical article on the subject written by Dave Stevens and Raymond Guries, Department of Forest and Wildlife Ecology UW-Madison, contact dstevens@wisc.edu.



Featured Herbicide – Oust XP in Autumn?

By Lyle Eiden, WDNR Forester in Portage County

Have you ever been hard pressed to finish a spring Oust XP herbicide application before trees seedlings begin to grow? If so you should consider spraying in the fall months. I have used it many times with great success. Here is a brief explanation of things to consider and a general outline of how to plan a fall spraying.

This fall spraying method has been very successful for following up with an initial spring seedling planting. I have not lost a spring planting that started with spraying Oust XP in the fall.

If spraying Oust XP in the fall you need to keep in mind the herbicide will lose roughly 20% of its strength over winter. Knowing this will help you when determining the rate.



When doing a fall spraying of Oust XP it is best to try and spray as late into the fall as possible to avoid the possibility of plants using some of the herbicide when it is not needed. The importance of this is that the herbicide will already lose 20% through winter volatility and if some of it is used during plant uptake in the fall this can drastically alter the target rate you wanted available come spring.

This method provides excellent competition control on established plantings through the month of July and into August. The two main reasons I believe the fall spraying to be successful is that the Oust XP residue that is on the terminal bud has all fall and winter to get washed off and at worst the melting snow provides enough water to incorporate the herbicide in the soil prior to any plants growing.

In spring several things can affect the success of the Oust XP. The timing of the spraying could be wrong, meaning it was sprayed too late. There may not be enough rainfall to activate

the herbicide prior to plants growing or there may not be a significant amount of rain to wash any herbicide residue off the terminal bud. These can all affect the effectiveness of Oust XP.

The fall spraying also provides a fairly consistent span of time to get the spraying completed. You could conceivably spray right up to the first snowfall of course you have to play around with freezing conditions but this can be worked around if you are organized

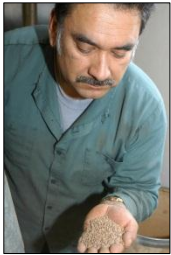
In spring the window of opportunity to spray can vary from a month to a few days. This can lead to one stressful planting season. The fall spraying allows you to sit back in spring knowing the herbicide step is complete and concentrate on other issues.



Hayward Nursery Status

Contrary to some perceptions, the Hayward Nursery is not closing, although production of nursery stock has ceased. Indeed, it will continue as a spring seedling distribution center.

Efforts are underway to convert approximately 29 acres of beds into butternut, jack pine, white pine, red pine, or white spruce seed orchards over the next six years. Property plans also include establishment of selected shrub seed production areas along with herbicide trial sites. In fall 2012, 39 endangered dotted blazing star plants were planted on site as part of a pilot in conjunction with the Prairie Habitat Restoration Project.



The nursery will continue to be the statewide processing center for conifer seed extraction. Over 1,340 bushels of conifer cones were processed in 2012! The nursery team is currently working with the U.S. Forest Service to acquire new seed extraction equipment which will increase efficiencies and reduce seed extraction costs.

*Ray Aguilera
Foreman, Hayward Nursery*



Happy Habitats Projects

Through September 2013, Girl Scouts in central and southwest Wisconsin are being encouraged to plant native species through the *Happy Habitats* service project. If you have a planting project and would like to get young girls involved, contact Katie at FoltsK@gsbadgerland.org or call 800-236-2710 ext. 1167. Click [here](#) for more information.



Direct Seeding

By Jeremiah Auer

Assistant Nursery Manager, Griffith State Nursery

A growing trend in reforestation is direct seeding; scattering seeds on a site rather than planting bare-root seedlings or plugs. Unfortunately, the nursery staff has only anecdotal evidence as to the effectiveness of this type of reforestation. To provide more accurate information to landowners interested in direct seeding, the nursery staff has begun following some of these efforts to monitor their effectiveness.



Prepared seed bed

One such opportunity is near Rosholt and involves a landowner that is no stranger to tree planting.

Rick Flees has planted trees on his family property over the years and works closely with Portage County DNR forester, Lyle Eiden.

Rick has a portion of an agricultural field with a large rock outcropping that was never easy to plant in crops. After discussing some options with Lyle, he decided to direct seed oak. Lyle wrote a plan, suggested ways to prepare the site for a fall 2012 direct seeding. Rick sprayed 2 quarts of glyphosate per acre in early August then disked the site a few weeks later. In mid-September he sprayed glyphosate again and waited another two weeks to disk. By the time the acorns (three bushels of red oak, two bushels of bur oak and one bushel of white oak) were ready for pick-up from the Griffith nursery, Rick's 1.5 acre field looked like a garden. In early October, he hand broadcast the acorns and used an agricultural roller to incorporate the seed into the soil.

Due to a high white-tailed deer presence, the site needed protection from acorn predators and seedling herbivory.

The nursery had an 8-foot roll of green polypropylene fence left over from an earlier project. Rick cut tamarack poles from an adjacent swamp conifer site and installed the poles and fence a few weeks after the planting. A wire runs on the top and bottom of the fence to keep it tight and offers support from the weather and wildlife. To add more



Deer fence

species variety, Rick will sprinkle eight ounces of white pine seed throughout the plantation in late winter or early spring. He will monitor the site for weeds and may apply an herbicide if competition becomes too great. He also has the added luxury of an adjacent irrigation system that he plans to use if the spring or summer becomes too dry.

In the spring of 2013, the Griffith nursery staff will establish reforestation monitoring plots to determine the germination of acorns. With the increase in interest of direct seeding, it will be important to have data to show the effectiveness of this reforestation strategy. Hopefully, this small planting in northeastern Portage County can act as an example for other landowners interested in direct seeding.

(All photos provided by Jeremiah Auer)



Bud Capping Conifers

By Greg Edge, DNR Silviculturalist

Bud capping is a simple and effective method to manage deer browse on tree plantings, especially for conifer protection from fall until spring. A variety of materials are used to protect a tree's terminal bud during the dormant season. Index cards, envelopes, waterproof paper, tinfoil, balloons and plastic mesh are a few examples. Commercial bud caps are available, but many landowners prefer to make their own to save money.



Bud caps are mostly used on conifers since deer eat conifer seedlings primarily during the late fall and early spring when bud caps can easily be installed without interfering with tree growth. Hardwoods also can be bud capped during the dormant season, however, they typically get browsed during the early growing season when the new vegetative shoots are emerging and bud capping is not possible.

Place materials over the terminal bud and staple to the needles. Bud caps may not be enough to a deterrent in areas with very heavy browse pressure. *Tip:* placing a slit or air hole in the top of the envelope promotes good air circulation and helps prevent damage to the bud. Keeping the terminal bud completely hidden seems to discourage curious deer. You can bud cap about 250 trees/hour/person. Removing bud caps each spring is a much faster operation.

Douglas County Forest implements bud capping on all jack pine plantations for the first three years. Work is completed via contract tree planting crews and costs \$35-\$45 per acre. For more details contact Jon Harris, Douglas County Forest Administrator at jharris@douglascountywi.org or at 715-378-2219. Read [more](#) at MN DNR's Silviculture Field Tips.



Feature Species - Northern Red Oak

By Joe VandeHey, Wilson Nursery Manager, Boscobel

Northern Red Oak, *Quercus rubra*, in the Beech Family (Fagaceae), is found throughout most of the eastern United States, into southern Canada, as far south as northern Alabama, and as far west as eastern Oklahoma and Nebraska. It is found throughout all of Wisconsin.

Northern red oak grows on a wide range of soil and topography, is moderate to fast growing depending on the site and is a relatively long lived species. Northern red oak is a valuable crop tree and an important species to the timber industry providing valuable lumber to the forest products and manufacturing industries in the state. It also is a very valuable species for wildlife communities providing shelter and heavy mast crops which support a wide range of wildlife including deer and turkeys.

Northern red oak is an excellent species to include in a new tree planting, especially if the focus is hardwoods. There are a few things to consider when including northern red oak in your tree planting. Northern red oak is moderately shade intolerant so it is best to plant in open fields or heavily thinned woods. Northern red oak is a preferred browse by whitetail deer. If you are planting in an area with high deer populations there are management and protection options that can be used to help reduce browse such as repellents, shelters, fencing, and hunting. Location within the planting could be used to reduce browsing also. Keep red oak away from the edges of wooded areas where they are more accessible by deer. You should also consider the history of oak wilt within your local forest community. Click [here](#) for more details on oak wilt.

Foresters are encouraging landowners to diversify their tree plantings, so when considering planting red oak, consider planting a mix of at least three or four species. This will minimize the threat of losing an entire tree planting to insects or diseases.

The state nursery program sells high quality northern red oak in both one and two year old bare-root seedlings of Wisconsin seed sources. A variety of other species and age classes are also available for reforestation and conservation purpose to serve Wisconsin landowner's planting needs and to create a woods of their own. Click [here](#) for more tree planting information.
http://plants.usda.gov/plantguide/pdf/cs_quru.pdf





WDNR's Reforestation Monitoring Program

2012 represented the sixth year of data collection for the reforestation monitoring program. Once a data analysis program is in place, a formal report with management recommendations will be written. In the meantime, to give you an overview of the protocol currently used, read on.



Nursery staff conducting reforestation monitoring survey work.

Site selection - Orders greater than 3,000 seedlings, of any species combination, on public or private land. Approximately five orders per county are surveyed.

- *Customer information* – Customer name, contact information, county planted and notes.
- *Nursery information* - Species, quantities, nursery of origin, lifting date/temperature/precipitation, stock phenology and shipping date/method.
- *Site information* - Legal description, planting size, physiology, planting difficulty, soil type, and previous cover type.
- *Site preparation* – Mechanical and chemical site prep methods/products, rates and timing prior to planting
- *Release treatment* – Mechanical and chemical site prep methods/products, rates and timing after planting.
- *Planting information* – Seedling storage method, planting plan present, hand/machine planting method, row spacing, plan forester, spacing and design, contractor, planting dates and temperature, planting aids, phenology at planting and stock condition.
- *Plot selection* - All trees within a 1/100th acre plot are surveyed, with one plot taken per acre in a systematic grid pattern. The first plot is randomly selected; subsequent plots are paced off at 200 foot intervals.
- *Plot information* –Species and age, survival status, competition, browse, planting/stress problems affecting the seedlings growth and survival.
- *Root check* – One tree per plot is randomly selected to be dug up for root examination.
- *Invasive species* – Documents species present, the area infected, population, and location.

All sites can be revisited at 3- and 7-year intervals.

Currently 743 sites have been visited and data collected on 43,198 individual trees. WOW, that's impressive! Thanks go to the laborious work of Roger Bohringer, Jeremiah Auer and the diligence of a couple limited term employees.

As part of the Strategic Direction Implementation steps, protocol for natural regeneration monitoring will be developed in the future.



Nursery Fact Sheet Updated

Read about the myriad of programs which compromise the state nursery program. Check out the updated Nursery [Fact Sheet](#).



Meet Your Nursery Managers



Roger Bohringer, Wilson Asst. Nursery Manager, Boscobel
Carmen Hardin, Science Section Chief, Madison
Pat Murphy, Nursery Team Leader, Eau Claire
Joe VandeHey, Wilson Nursery Manager, Boscobel
Jim Storandt, Griffith Nursery Manager, Wisconsin Rapids
Missing - Jeremiah Auer, Griffith Asst. Nursery Manager, Wisconsin Rapids

THE MISSION of the state nursery program is to insure a consistent supply of high quality seedlings, of desirable forest species, at an economical price, to encourage reforestation in Wisconsin.



Deer Repellent Trials

Adapted from a 2007 article by David Harbec former Asst. Nursery Manager, Hayward



Overview

Two-year old jack pine seedlings planted at the Brule River State Forest in spring 2004 were treated with six different retail deer repellents in fall 2005 and again in fall 2006. The seedlings were monitored for deer browse activity in spring 2006 and again in spring 2007, along with height measurements in 2007. All products had an effect, none significantly better than the other, but all better than no repellent at all. This article presents spring 2007 data collection and results.

Materials and Methods

The study area consisted of 24 rows of 1-year out-planted jack pine 2-0 seedlings (part of a larger planting on a jack pine cut-over site) located five miles south of Brule in the Brule River State Forest. The rows were approximately 400 feet in length and eight feet apart. Seedlings were spaced roughly six feet apart, yielding 50-70 seedlings per row.



Treatments consisting of six repellent products and controls were applied in two-row blocks (two rows of repellent A, two rows of control, two rows of repellent B, two rows of control, etc...), with no replication (see costs in Table 1).

Repellent products were applied in two successive years, early October 2005 and early October 2006, prior to the common deer browsing time of jack pine seedlings (mid/late fall through spring). Quart sized spray bottles were used to apply the products (approx. 2-3 squirts of product per seedling).

Browse activity was monitored and scored in June 2006 and again in June 2007. Scoring was as follows:

- **B1:** leader and/or buds partially missing and/or up to two laterals partially browsed (i.e. less than 1/3 damage to tree);
- **B2:** leader completely missing and lateral(s) partially or completely missing, three or more laterals still intact (i.e. 1/3-2/3 damage to tree);
- **B3:** leader completely missing, no more than two viable laterals left; seedling much smaller than others in the planting (i.e. 2/3 or more damage to tree).

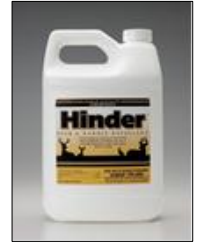
Heights of all live seedlings within the experiment were collected in June 2007 (see Table 2).

Discussion

As discovered in the spring 2006, the effectiveness of deer repellent products on jack pine seedlings was evident for all products used in contrast with the control seedlings. (97.8% browse rate on control seedlings (“% of Living Seedlings with Browse Damage”).

Mortality was shown to be higher for the control seedlings (21.3% compared to 2.8%-11.5%), possibly the result of excessive browse and encroaching competition.

Both Tree Guard® and Hinder® had some effect against deer browsing but had significantly lower performance in terms of browse rate and average height compared with the other four products. This may be due to a lower residual effect against browsing in the spring when carrying out a fall application.



The two blood plasma products (Plantskydd® and Repellex™) performed the best in average height however, not significantly greater than either Thiram or Deer Off®. Additionally, both Thiram and Repellex™ showed the lowest browse rate.

The “Study Average” (Table 2) shows that the height of “Non-Browsed” seedlings was double that of “Browsed” (14.4” vs. 28.5”), regardless of the treatment (including control). Additionally, this is a doubling in size from the seedlings’ initial height at planting where jack pine 2-0 seedlings tend to average 12-14” prior to planting. Simply put, in this study, two-year old jack pine seedlings not treated with a fall application of deer repellent over successive years exhibited little-to-no height growth at 3 years post-planting. Those that were treated experienced a doubling in overall height.

In summary, fear-inducing repellents generally perform the best; taste repellents tend to be less effective. Repellents can protect for several weeks, but expect shorter protection periods during the growing season when new foliage is emerging and heavy rains may be frequent. Although deer browse may occur year-round, timing repellent applications to critical browse periods can improve success. Conifer seedlings need special protection during the late fall and early winter prior to snowfall and again in early spring after snowmelt. Hardwood seedlings may need to be treated multiple times during the summer to protect each new flush of growth.

Table 1

Product	Active Ingredient (AI)	Rates	Volume (1000 Seedlings)	Cost* (1000 Seedlings)
Deer Off®	Whole egg solids, capsaicin/capsaicinoids	0.5 qts/Gal. H2O	1.5 Gallons	\$21.94
Repellex™	Dried animal blood plasma; latex carrier	0.45 Gal./Gal.	1.5 Gallons	\$63.86
Hinder®	Ammonium soaps of fatty acids	0.2 qts/Gal.	1.5 Gallons	\$ 6.30
Tree Guard®	Denatonium benzoate (Bitrex)	7.76 grams A.I./quart (pre-mixed)	1.5 Gallons	\$57.00
Plantskydd®	Blood plasma and latex carrier	1.1 lbs./Gal.	1.5 Gallons	\$27.71
<i>Thiram</i>	Thiram (fungicide)	1 qt/Gal.	1.5 Gallons	\$18.06

*Costs are based on an August 2007 internet search.

Note: Some repellents may require a pesticide applicator's license if done for hire – please read labels

Table 2

Repellent Study June 2007 data only	% Live Seedlings with Browse Damage	% Mortality	Average Height (inches)	“Non-Browsed” Average Height (inches)	“Browsed” Average Height (inches)
Deer Off®	13.8	3.3	24.5	25.7	13.8
Repellex™	1.3	4.9	30.3	30.3	NA
Hinder®	67.1	6.2	19.5	30.5	15.9
Tree Guard®	77.1	5.4	19.2	27.3	16.2
Plantskydd®	10.4	11.5	28.7	29.9	14.3
<i>Thiram</i>	2.9	2.8	27.4	27.8	13.0
Control	97.8	21.3	13.7	28.0	13.6
Study Average				28.5	14.4

State Nurseries

Griffith State Nursery (Wisconsin Rapids): Jim Storandt, Nursery Manager, 715-424-3702, james.storandt@wisconsin.gov

Wilson State Nursery (Boscobel): Joe VandeHey, Nursery Manager, 608-574-4904, joseph.vandehey@wisconsin.gov

Hayward State Nursery (Hayward): Ray Aguilera, Foreman, 715-634-2717, domingo.aguilera@wisconsin.gov

Reforestation Monitoring Program:

Jeremiah Auer, Griffith State Nursery (Wisconsin Rapids), 715-424-3700, jeremiah.auer@wisconsin.gov

Roger Bohringer, Wilson State Nursery (Boscobel), 608-485-1425, roger.bohringer@wisconsin.gov

Send article suggestions, submissions or comments to:

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www.dnr.wi.gov, search “tree planting”

